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Dears Participants of the Conference,

the international scientific conference "Economic Policy in European Union Member Countries" is the annual platform for international scientific discussion on economic policy in its broadest sense.

The sixteenth volume of this conference was held on September 12 - 14, 2018, Čeladná, Czech Republic. As in previous conferences, this year´s one is a platform for the worldwide dissemination and sharing of ideas for research in the field of Economic Policy, European Union, Crisis of Euro, Debt Crisis in the European Union, Future of European Integration, External Relations of the European Union, Labour Market, Globalisation Processes, Competitiveness, Regional Disparities.

I would like to thank the organizing committee for their efforts in helping us compile this volume. I would also like to express my deeply appreciations and thanks to all participants for their high quality contributions. It was our pleasure to welcome at our conference a significant number of participants from abroad.

We are happy that we have been able to get such broad participation from different sectors of the scientists, practitioners, policy makers and private sector actors. Together we try to advance efforts and present new ideas related to different aspects of economic policy.

The proceedings contain only papers that have successfully passed a double-blind referee process and whose authors had agreed with publication in the proceedings. There have always been two referee reports on each paper. The referees selected are distinguished scholars from Czech as well as foreign universities.

I hope that next volume of our conference will be successful and enjoyable to all participants. We look forward to seeing all of you next year at the seventeenth volume of "Economic Policy in European Union Member Countries".

Associate Professor, Dr. Michal Tvrdon
Vice-Dean of Science and Research

CONTENTS

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CROWDFUNDING IN SOME COUNTRIES OF THE EUROPEAN UNION: WHICH FACTORS DETERMINE NUMBER OF LAUNCHED PROJECTS?

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Abstract
Crowdfunding is a practice of funding a project or venture by raising monetary contributions from a large number of people. Crowdfunding is used to fund a wide range of economic activities such as Agriculture, Philanthropy, Real estate, Intellectual property exposure, Science, Journalism and others. So far, projects with total value about 40 billion USD have been raised using crowdfunding platforms. The aim of this paper is to identify the main factors which causes the changes in demand for peer to peer financing via crowdfunding platforms in the selected European Union countries. We use monthly data from 106 platforms from 2014 to 2017 in our analysis. Our final panel consists of xxx observations. Generally, four kinds of crowdfunding projects exists – reward based, equity based, donation based and debt based. We focus on debt-based projects only. We found that factors such as interest rates, unemployment or consumers' expectations of future performance of economy play crucial role in it.

Keywords
Crowdfunding, Debt-based, Loans, Microloans, Peer-to-peer lending.

JEL classification
D12, E41, G23, M13

1   Introduction

The history of banking and money lending goes deep into the past. First "banks" were established around 2000 BC in Assyria, Babylonia and China. Later, similar institutions originated in ancient Greece and Roman Empire. Lenders operating in temples offered loans and received deposits, and were even willing to participate in money exchange and mediating business.. Individual forms of banking and money lending have changed over the course of history, but not all people had access to these institutions and resources. Due to worries about ensuring survival and lack of leisure time, certain classes of people have never been able to pursue engagement in the mutual financial trade.

A modern era, great increase in wealth and upheavals in social life, however, brought about change. Now, entrepreneurs, innovators and various enthusiasts do not have to rely on their own financial resources or banks which strongly reassessed their lending standards, particularly after the financial crisis of 2007 and 2008.

The massive expansion of the internet has enabled potential borrowers to meet their lenders and cooperate in a variety of personal crowdfunding initiatives. With modern personal computers as intermediaries the whole process of community funding has accelerated. According to the World Bank (2013), one third of the world's population has access to the Internet and approximately 85 percent of people have access to a mobile phone in 2013. In principle, crowdfunding has become available practically for everyone.

There are many definitions of crowdfunding but essentially it is *"an open call, essentially through the Internet, for the provision of financial resources either in form of donation or in exchange for some form of reward and/or voting rights in order to support initiatives for specific purposes."* (see Lambert and Schwienbacher, 2010, p. 4). According to De Buysere et al (2012) there are four basic

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types of crowdfunding platforms or models: (1) the donation model (a donor contract without existential reward), (2) the reward model (a purchase contract for some type of product or service), (3) the lending model (a credit contract, where the credit is being repaid), (4) the equity model (a shareholding contract, where equity-like instruments are shared in the project). In this paper we focus on the lending model (also called debt model or the model of micro-financed loans).

The model of micro-financed loans mediated on the Internet enables individual lenders to locate individual borrowers and vice-versa. We could see a tremendous growth in the online peer to peer market across the world. Mateescu (2015) mention that the first peer to peer lending platform, Zopa, was estabilished in the UK. It was soon followed by Prosper, Lending Club and others in the United States.

In the recent years the crowdfunding financing have gained even a scientific attention which helps to understand to key issues in the community funding. There is nevertheless an important and still unresolved question: what are the main determinants which cause that individual borrowers require funds via crowdfunding platforms? In other words: what are the main factors of the demand for the crowdfunding financing? Therefore, the aim of this paper is to identify the main factors which causes the changes in demand for peer to peer financing via crowdfunding platforms in the European Union countries.

The remainder of the paper is organized as follows. In Section 2 we offer a short literature review. Section 3 describes a methodology and data. In Section 4, we describe the results of the regression analysis on the factors influencing the amount of money requested through peer to peer lending. Section 5 concludes.

2 Literature review

In our paper, we examine a debt-based crowdfunding, also known as a peer to peer lending or a lending-based crowdfunding, which is one of the most popular types of crowdfunding. Mollick (2014) describes the debt-based crowdfunding as one in which funds are offered as a loan, with the expectation of some rate of return on capital invested.

Bock et al (2014) add that the lending based models of crowdfunding rely on relatively traditional investment mechanism. These models link founders and supporters in a debtor (borrower) and lender relationship. These micro-financed loans were initially built on the relationship between individual lenders and borrowers. But today, the majority of peer to peer loans are offered by large investors like banks or hedge funds (Mateescu, 2015).

Generally, firms prefer the least costly ways of financing their business. Myers (1984) describes the pecking order framework, in which the firms prefer internal to external financing and debt to equity if they issues securities. Vanacker and Manigart (2010) claim that the pecking order theory predicts the existence of a financing hierarchy and the firms try to avoid the higher cost of external financing if possible. Fraser et al (2015) add that borrowers may be skewed towards the other than the classical external finance not just because it is actually harder to obtain these finance but also because it is perceived to be harder.

The lack of access to the traditional capital sources after the recent financial crisis have driven the demand for alternative sources of financing for small businesses and start-ups. Bruton et al (2015) mention that these new alternative forms of finance including micro-lending, crowdfunding or peer to peer financing can bridge the gap between supply and demand for entrepreneurial finance.

Our analysis is focused on the demand side of the peer to peer lending market. The demand side of the market consists of individual borrowers who are trying to find funding resources. Studies elaborating the demand side of the peer to peer market often investigate the role of individual characteristics of borrowers in raising capital. These studies on the lending-based crowdfunding address e.g. a question of the role of appearance in peer to peer lending. Duarte et al (2012) find out that borrowers who appear more trustworthy have higher probabilities of having their loans funded. Such a borrowers have also better credit scores. Similar studies examine the role of narratives by

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borrowers in influencing lender decision making regarding personal loans. Herzenstein et al (2011) argue that the higher number of identity claims in narratives leads to the higher loan funding. Similar to Duarte et al (2012) they find out that identities about being trustworthy or successful are associated with increased loan funding.

We however focus on the macroeconomic factors which determine a demand for the peer to peer financing itself. There is no such a study investigating this particular problem, but several studies investigating a demand for the traditional lending exist.

Calza et al (2003) use Vector Error Correction Model (VECM) and investigate the short-run and long-run dynamics of the demand for euro area loans. They show that in the long-run, real loans are positively related to real GDP and negatively to real short-term and long-term interest rates. Authors add that most studies on the factors influencing credit demand include an economic activity variable (such as industrial production or real GDP) and financing costs (interest rates) as main determinants. Not only macroeconomic variables and shocks however influence the demand for loans. Basset et al (2014) mention that it is particularly difficult to identify macroeconomic effects of credit shocks because many of the factors that influence the supply of loans also affect the demand for credit. On the base of the Federal Reserve's Loan Officer Opinion Survey, they find out that changes in lending standards also affect the demand for loans.

Del Giovane et al (2011) examine the period of the sharp slowdown in bank lending between 2008 and 2009 in Italy. They ask the question to what extent it was the result of macroeconomic forces and their effects on credit demand instead of a tightening the bank supply. The analysis combines qualitative information from the Eurosystem Bank Lending Survey (BLS) with micro-data on loan quantities and prices for the Italian banks included in the survey. Authors find out that BLS indicators for both supply and demand conditions influence the lending to enterprises in Italy. Their results are robust to the introduction of various control variables.

Kapounek et al (2017) investigate the bank lending activity after the financial crisis. They argue that loan-rate spreads and asset quality are found to be the main supply factors of bank lending activities in the EU. They mention that the supply factors seem to be especially important for large banks, while small banks are more sensitive to the demand development.

3   Methodology and data

Our benchmark estimation approach is Ordinary Least Squares (OLS) method with Fixed Effects (FE). Following similar empirical studies on panel data we use FE regressions to control for further country-specific heterogeneity. We also include time (month) dummies to capture cross-country type macroeconomic shocks that are not fully controlled by our independent macroeconomic variables. The time-dummies can eliminate common time effects that might otherwise impart cross-country error correlations. Moreover, we use robust standard errors in all our regressions (White-corrected standard errors) because the idiosyncratic errors may still be distorted by possible autocorrelation or heteroscedasticity.

3.1   Methodology and empirical model

To test the factors which causes changes in demand for peer to peer financing we use panel data framework. Our empirical model is based on Calza et al (2003) but it is adjusted for the analysis of the peer to peer money lending:

$$ln\_MR_{it} = \alpha INTEREST_{it} + \beta CONS\_CONF_{it} + \gamma SHARE_{it} + \delta UNEM_{it} + \theta LE_{it} + \vartheta PP_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

The dependent variable ln_MR_{it} is the logarithm of amount of money required in the peer to peer funding campaigns for every month since January 2014. The variable $INTEREST_{it}$ represents interest

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rates from 10years government bonds, $CONS\_CONF_{it}$ is a consumers' opinion about future tendency in economy, $SHARE_{it}$ is a share index and $UNEM_{it}$ is a variable representing unemployment. The variables LE_{it} and PP_{it} are extracted from Google Trends and represent a popularity of the search queries "loans" (LE) and "peer-to-peer lending" (PP) in a particular country. The term μ_i captures unobserved country-specific effects and ε_{it} is the error term.

3.2 Data

We analyze debt crowdfunding campaigns which consist from the invoice trading (approximately 8% of our dataset) and (micro) loans (92% of our dataset). The dataset includes information on 136,317 debt crowdfunding campaigns from 106 platforms including Zopa (39.82% of the sample), Funding Circle UK (19.37%), RateSetter (18.11%) or MarketInvoice (8.15%). Remaining 14.55 % are from 102 other platforms. We calculated amount of money required in these peer to peer funding campaigns for every month since January 2014 to October 2017. It is sum of all projects launched in particular country in given period (month) multiplied by their respective goal amount.

We analyze panel data on five countries of the European Union (France, Germany, the Netherlands, Spain and the United Kingdom). The panel is strongly balanced (it contains monthly data from January 2014 to October 2017).

We use following variables as independent variables. Each of them is connected to some factor which we consider as one that can influence the demand for crowdfunding loans.

Interest rate (+)

We expect that higher interest rates in economy will lead to growth of demand for debt-based crowdfunding projects. Higher interest rates increase costs of traditional loans and therefore economic subjects are motivated to start new projects. We use variable $INTEREST$ as a proxy of interest rates in particular country. Interest rates from 10years government bonds (EMU convergence criterion bond yields) are often considered as a measure of price of money in economy. That is why they are considered as a Maastricht convergence criterion. One can argue that the usage of money market rates is more convenient, because the risk premium is not included in them. Nevertheless, since we use data for 4 countries from the euro area, we cannot use these data. Monthly data were gathered from Eurostat Database (Eurostat, 2018).

Performance of economy (+)

Since we use monthly data, we cannot use GDP as an approximation of the performance of the economy. Therefore, we use two another variables instead. First of them try to measure consumers' confidence, the second is focused on firms.

Households (+)

We use Consumer Opinion Surveys to measure households' future expectations about development of economy ($CONS\_CONF$). Particularly, we use consumers' opinion about future tendency in economy provided by OECD. The question asked for the compilation of this indicator is "How do you expect the general economic situation in this country to develop over the next 12 months? It will (++) get a lot better (+) get a little better (=) stay the same (-) get a little worse (--) get a lot worse (N) don't know (OECD, 2018). These data are available every month. Moreover, we think that expectations about future tendency in economy are more convenient than GDP data while we try to figure out what does lead economic subject to ask for loans. We expect that the better expectations economic subjects have, the higher the amount of money they want. We use seasonally adjusted data from OECD Database (OECD, 2018).

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Firms (+)

We use a share index ($SHARE$) in order to capture a current condition of economy. We stay that the growth in share index may indicate a positive expectation on the markets, and therefore, economic subjects are willing to invest more, so the demand for the loans will be increasing.

Share price indices are calculated from the prices of common shares of companies traded on national or foreign stock exchanges. They are determined by the stock exchange, using the closing daily values for the monthly data, and expressed as simple arithmetic averages of the daily data. A share price index measures how the value of the stocks in the index is changing, a share return index tells the investor what their "return" is, meaning how much money they would make as a result of investing in that basket of shares (OECD, 2018). Monthly data of share price index were gathered from OECD Database (OECD, 2018).

Unemployment (–)

We measure unemployment ($UNEM$) as the unemployment rate in %. We argue that people without a job are less likely to ask for a loan. Therefore, we expect that the higher rate of unemployment will lead to the lower demand for loans. Monthly data were gathered from Eurostat Database (Eurostat, 2018).

Increasing role of CF (+)

It is possible that an increasing role and popularity of CF leads to the growth of total money wanted through this kind of financing itself. There are several ways how to capture the popularity of CF financing. We use data from Google Trends. These data depict the searchers interest in a given phrase.

Data from Google Trends represent a relative interest in the search relative to the highest value for a given area and time. Value 100 represents the highest popularity of the expression. A line trending downward means that a search term's relative popularity is decreasing. But that doesn't necessarily mean the total number of searches for that term is decreasing. It just means its popularity is decreasing compared to other searches (Google, 2018).

We searched for two expressions "loans" (LE) and "peer-to-peer lending" (PP) in a particular country. Monthly data were download from Google Trends database (Google, 2018).

4   Empirical results

The results of our analysis are depicted in Table 1. The first column represents a benchmark specification without the data from Google Trends. Other two columns show the results with the Google trends variable LE ("loans") and with the variable PP ("peer-to-peer lending"). The bottom of the table shows respective R-squared, Akaike information criterion, Schwarz criterion and Hannan-Quinn criterion.

The results are quantitatively comparable across the three models and hence seem robust. Most notably, the variables CONS_CONF and SHARE are clearly significant in all models (at 5% or 1% significance level). In contrast, the variable INTEREST is not significant in the first model when data from Google Trends are not included in. The variable UNEM is insignificant in the last model.

The results show that the demand for peer-to-peer financing is influenced by similar factors as the more conventional money lending (e.g. through banks). There is a significant role of financing costs (interest rates) and the factors influencing economic activity which are represented by expectations of consumers and by the expected condition of the economy expressed by the value of share index. The results, however, do not clearly show that the demand for crowdfunding financing depends on the relative popularity of crowdfunding. The amount of money required through peer-to-peer lending platforms seems to be linked to the term "loan" which nevertheless represents rather general popularity of debt financing than the debt financing through crowdfunding. The effect of the relative

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popularity of term "peer-to-peer lending" is statistically insignificant although it gets the expected sign.

Table 1. The factors causing changes in a demand for peer to peer financing

Variable	1	2	3
INTEREST (+)	0,370 (0,262)	0,462** (0,189)	0,423** (0,173)
CONS_CONF (+)	0,018** (0,008)	0,017** (0,008)	0,017** (0,008)
SHARE (+)	0,016** (0,008)	0,020*** (0,007)	0,019*** (0,007)
UNEM (-)	-0,113* (0,062)	-0,128* (0,068)	-0,116 (0,071)
LE (+)		0,005* (0,003)	0,005* (0,003)
PP (+)			0,003 (0,003)
Adjusted R-squared	0,893	0,894	0,893
Akaike info criterion	2,218	2,217	2,221
Schwarz criterion	3,025	3,039	3,058
Hannan-Quinn criter.	2,543	2,549	2,558

Note: ***, **, * represent 1%, 5% and 10% probability level.

Source: OECD.

5   Conclusion

In this paper, we tried to identify the main factors, which causes the changes in demand for peer-to-peer financing via crowdfunding platforms in some of the European Union countries. We tested four macroeconomic variables, which we considered as these factors. Based on our model, we can say that higher interest rates in banks and better economic conditions lead to the growth of demand for crowdfunding loans.

Contrary, the growth of the unemployment leads to the decreasing demand for crowdfunding loans. These results are in line with the theoretical presumptions. Moreover, we tried to investigate whether the increasing role of crowdfunding itself can influence the demand for microloans. We used Google Trends data in order to find how often some phrases related to micro-loans are searched on the internet. We found that only term "loans" in English was statistically significant.

6   Acknowledgement

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Annex

Charts of variables
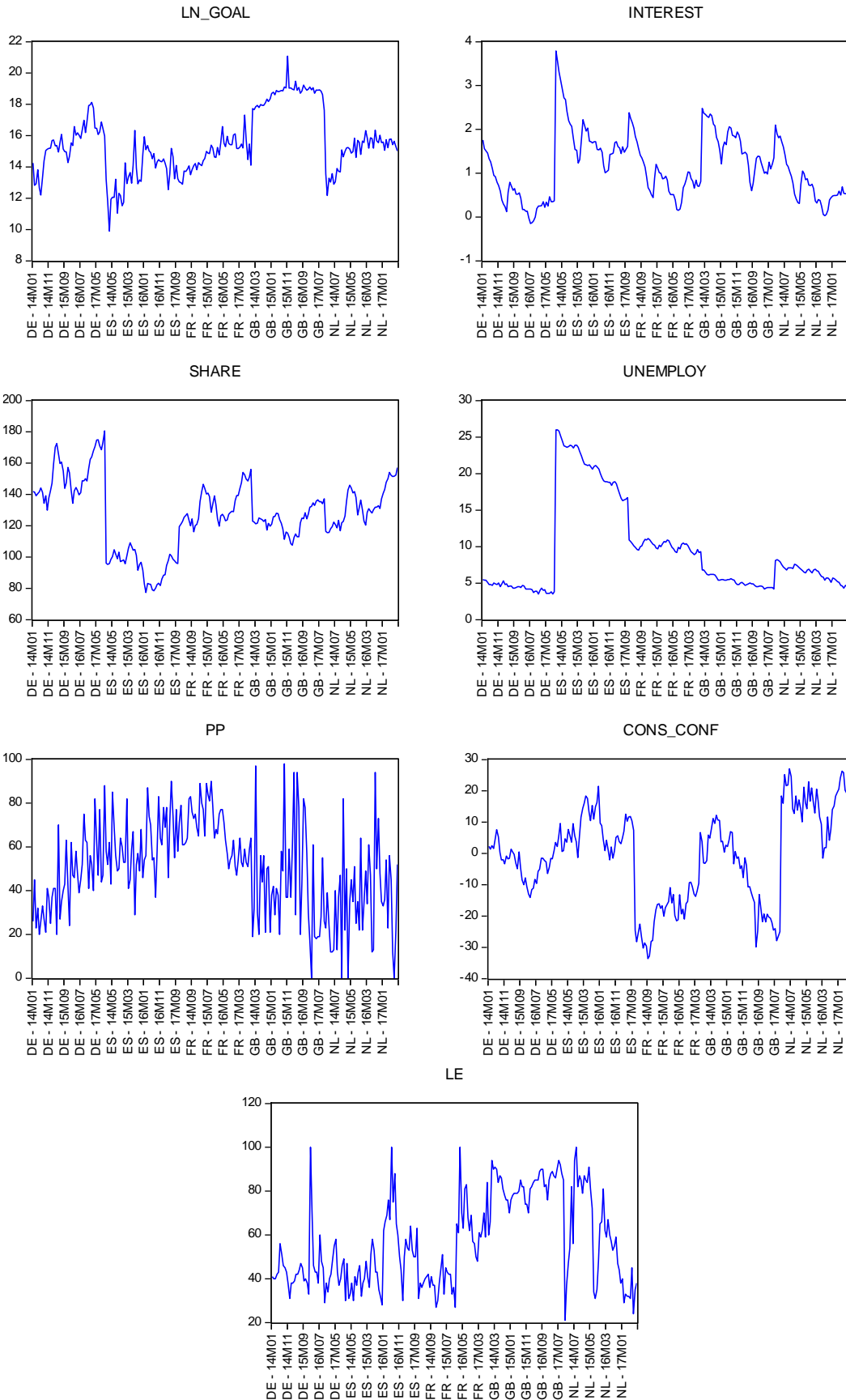
DETERMINANTS OF HOUSEHOLD CONSUMPTION BEHAVIOR IN CZECH REPUBLIC: ANALYSIS OF MICRO-DATA

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Abstract
Since Keynes formulated his consumption theory it has become a common habit to identify individual consumption with the consumption of aggregate in many aspects. But is really possible to simplify economic behavior that much? Is an aggregate consumption demand just a simple sum of individual household demands? Although many studies still obey the old habit that was started by Keynes, the answer to the aforementioned questions is obvious. Not only that behavior of individual units is significantly different from the aggregate one, there are also some aspects at the micro-level that for its nature can't be visible using macro-data and vice versa. That's why it is always necessary to take into account the nature of the data used before making any general conclusion. In the same sense, many studies have been done in terms of aggregate consumption function in Czech Republic, but we can say just a very little about consumption behavior of individual households based on them. The aim of this work is to make a little contribution in this field by defining and describing the basic determinants of average propensity to consume of Czech households. Our cross-sectional analysis shows up that one of the most influential factors of this consumption behaviour is relative income. That is a factor that can't be observed at a macro-level.

Keywords
Consumption, Micro-data, Propensity to consume, Relative income.

JEL classification
C21, D11, D12

1   Introduction

It is not necessary to emphasize what is obvious: consumption is the ultimate goal of any economic effort. So the study of the determinants of consumption behaviour is, in the same line, an investigation into the very nature of economics itself. There has been a great progress in the recognition of consumption behaviour since Keynes (1936) first presented what we now call a consumption function. The main contribution can be seen especially in the concept of life cycle – permanent income hypothesis (Modigliani and Brumberg, 1954; Friedman, 1957) later amended by the aspect of rational expectation by Hall (1978) and his random walk model. Significant enrichments of consumption theory were later achieved in the concept of liquidity constrains and myopia (Flavin, 1985), models combining proportional relationship of consumption and income with intertemporal preferences (Campbell and Mankiw, 1989) or the precautionary motive and buffer-stock saving by Carroll (1997). Among recent studies investigating determinants of consumption behaviour we can mention for example Berger et al. (2018), dealing with the influence of house prices, Aizenman, Cheung and Ito (2016) who focus on the interest rate channel or a study following the consumption over the life cycle in terms of durables (Fernández-Villaverde and Krueger, 2011). However, this mainstream approach often focuses primarily on the aggregate level or (worse) implicitly assumes aggregate consumption behaviour to be equivalent to the behaviour of individual consumption units. Speaking about the latte, is it really possible to simplify economic behaviour that much? Is an aggregate consumption demand just a simple sum of individual household demands?

Although many studies still obey the old habit that was started by Keynes (1936), the answer to the aforementioned questions seems to be obvious. Not only that behaviour of individual units is significantly different from the aggregate one, there are also some aspects at the micro-level that for its nature can't be visible using macro-data and the and vice versa. For example relationships based on relative standings or comparison like the relative income effect first described by Duesenberry (1949), can't be observed when there is just one (aggregate) consumption unit that has nothing to

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compare with. The aim of this work is to make a little contribution in identifying those effects that may have been hidden in the shadow of macroeconomic research, in particular we focus on defining basic determinants of average propensity to consume of Czech households.

The structure of the paper is as follows. In the second section we introduce the data, the model and the method of estimation. Section 3 puts forward the result and briefly comments on them and in the final section 4 we conclude.

2 Data and model

To investigate the particular characteristics of the consumption patterns of Czech households we use a cross-sectional regression analysis. Before describing its technical properties we need to introduce the input dataset first.

2.1 Initial data

As mentioned in the introduction we follow the consumption function of individual units, particularly we focus on the household-level behaviour. There is no other source of data for budgetary behaviour of Czech households large enough except for Household Budget Survey (HBS) run by Czech Statistical Office. We use a cross-sectional dataset, particularly the HBS wave from 2015 with the total number of 2929 observations.

There are characteristics of households that serve as initial variables entering the subsequent analysis, they are:

APC – average propensity to consume,

YR – relative income,

group – economic status of the head of the household:
1) employees with lower education (reference category),
2) self-employed,
3) employees with higher education,
4) households of inactive people with EA members,
5) retired (non-working) without EA members,
6) unemployed,
7) other households without EA members.

edu – education of the head of the household:
1) 1. stage of elementary school (reference category),
2) 2. stage of elementary school,
3) lower secondary without graduation,
4) full secondary with graduation,
5) conservatory,
6) higher vocational,
7) bachelor's degree,
8) master's degree,
9) doctoral degree.

gen – gender of the head of the household:
1) man (reference category)
2) woman

age – age of the head of the household.

The response variable - the average propensity to consume was derived according to the fundamental formula:

$$APC_i = \frac{C_i}{Y_i} \tag{1}$$

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where C_i is households consumption expenditure per month (per capita) and Y_i is their net pecuniary income per month (per capita). The relative income variable in the sense of Duesenberry (1949) is particularly defined according to the formula introduced by Badura (2017):

$$Y_{R_i} = \frac{Y_i}{\dfrac{\sum_i^N Y_i \cdot w_i}{\sum_i^N w_i}} \tag{2}$$

where w_i stands for number of household members. In other word, Equation 2 says that relative income for each household is given by dividing its income by the weighted average of income in the society (of size N) that the household live in. As we can see, the weights in our case were set as the household size, which should the best represent the importance of given household in the society.

After the first investigation of the data, 2 observations had to be dropped out as extreme outliers (their APC were 58.2 and 8.6 respectively). Descriptive statistics (for continuous variables) and frequencies (for categorical variables) are presented in Tables 1 and 2 respectively.

Table 1. Descriptive statistics for continuous variables

	Number of observations	Mean	Standard deviation	Min	Max	Skewness	Kurtosis
APC	2 927	0.82	0.26	0.1	4.56	3.11	33.3
Y_R	2 927	1.09	0.62	0.13	13.04	6.53	95.48
age	2 927	51.83	14.65	20	90	0.21	2.32

Source: own calculations and processing.

Table 2. Frequencies for categorical variables

		Frequency	Percent
group			
1)	employees with lower education	723	24.70
2)	self-employed	422	14.42
3)	employees with higher education	942	32.18
4)	households of inactive people with EA members	157	5.36
5)	retired (non-working) without EA members	516	17.63
6)	unemployed	127	4.34
7)	other households without EA members	40	1.37
edu			
1)	1. stage of elementary school	4	0.14
2)	2. stage of elementary school	134	4.58
3)	lower secondary without graduation	1 246	42.57
4)	full secondary with graduation	1 132	38.67
5)	conservatory	3	0.10
6)	higher vocational	24	0.82
7)	bachelor's degree	56	1.91
8)	master's degree	312	10.66
9)	doctoral degree	16	0.55
gen			
1)	man	2 010	68.67
2)	woman	917	31.33

Source: own calculations and processing.

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2.2 Model

To achieve the goal of the paper that is investigating a defining the determinants of average propensity to consume of Czech households we introduce two estimated models. The first one we call M1 and it represents the baseline model in our analysis. The structure of this model is as follows:

$$APC_i = \beta_0 + \beta_1 Y_{R_i} + \sum_{j=2}^{7} \alpha_j group_{(j)i} + \beta_2 gen_{(2)i} + \beta_3 age_i + \beta_4 age_i^2 + u_i \tag{3}$$

where average propensity to consume of household i is explained by its relative income Y_{Ri}, set of dummy variables representing the economic status of the head of the household ($group_{(2)}$ to $group_{(7)}$), another dummy variable for gender of the head of the household $gen_{(2)}$ (particularly taken value of 1 when the person is woman) and age of the head which is included also in its squared form to reflect the U-shaped relationship, traditionally expected in the age-consumption relationship. There are set of estimated coefficients including the level constant β_0, parameters $\beta_1 - \beta_4$ and $\alpha_2 - \alpha_7$. The last term in the equation u_i stands for the random error that is an influence of all other variables affecting APC not included to the model.

The second estimated model we call M2 and it represents the alternative model meant especially for comparison. The structure of M2 is basically the same as in the M1 with the only difference that the variable of economic status of the head of the household was replaced by variable representing the education of the head of the household. The particular form of this model is:

$$APC_i = \beta_0 + \beta_1 Y_{R_i} + \sum_{k=2}^{9} \gamma_k edu_{(k)i} + \beta_2 gen_{(2)i} + \beta_3 age_i + \beta_4 age_i^2 + u_i \tag{4}$$

where the new set of dummy variables $edu_{(2)} - edu_{(9)}$ represents the categorical variable of education of the head of the household mentioned above and $\gamma_2 - \gamma_9$ stand for their estimated parameters.

Since we use a cross-sectional dataset we don't have to use any special econometric method and the simple OLS can be used for both M1 and M2 models. As for the estimated coefficients we assume negative value of the parameter β_1, because in line with the relative income hypothesis households standing higher in the income distribution should be able to safe higher fraction of their income and thus to relatively consume less, as demonstrated for example by Frank (1985), Clark, Frijters and Shields (2008) or Badura (2017). In the $APC - age$ relationship we assume the U-shaped form as mentioned above. Particularly it means the assumption of negative coefficient for variable age and positive for its quadratic form. As for the impact of categorical variable $group$, we generally expect the households, where the head is employed to have lower APC than unemployed or economically inactive. We also assume that higher education leads to higher savings rate a thus lower average propensity to consume. We don't make any assumptions about the influence of a gender.

3 Empirical results

The coefficient estimations for the baseline and alternative model are summarized in the Table 3, where numbers in parenthesis are given p-values. Let's note first that in both cases Breusch-Pagan test indicates significant heteroscedasticity (with the test statistics of 466 and 248 respectively) so in order to keep all subsequent t-tests and f-tests valid we had to estimate the coefficients with robust standard errors.

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Table 3. Estimation results for models M1 and M2

		M1	M2
Y_R		-0.106 (0.000)	-0.135 (0.000)
group			
2)	self-employed	0.107 (0.000)	N.A.
3)	employees with higher education	0.013 (0.188)	N.A.
4)	households of inactive people with EA members	0.025 (0.169)	N.A.
5)	retired (non-working) without EA members	0.095 (0.000)	N.A.
6)	unemployed	0.168 (0.000)	N.A.
7)	other households without EA members	0.193 (0.004)	N.A.
edu			
2)	2. stage of elementary school	N.A.	0.085 (0.468)
3)	lower secondary without graduation	N.A.	0.11 (0.343)
4)	full secondary with graduation	N.A.	0.141 (0.223)
5)	conservatory	N.A.	0.156 (0.466)
6)	higher vocational	N.A.	0.063 (0.595)
7)	bachelor's degree	N.A.	0.276 (0.044)
8)	master's degree	N.A.	0.174 (0.136)
9)	doctoral degree	N.A.	0.121 (0.310)
gen (woman)		0.078 (0.000)	0.086 (0.000)
age		0.008 (0.000)	0.006 (0.007)
age^2		-0.0001 (0.000)	-0.0001 (0.007)
β_0		0.693 (0.000)	0.66 (0.000)
R^2		0.152 (0.000)	0.131 (0.000)

Source: own calculations and processing.

We can start the commentary on the Table 3 by saying that both models came out statistically significant and all estimated coefficients are quite stable and thus robust when switching between the models. Despite the unquestionable significance of both models their coefficients of determinations are relatively low, which indicates that many aspects influencing the propensity to consume have still remained hidden within the error term. However higher value of R^2 is only rarely seen in the cross-sectional analysis so with this in mind we can call the R^2 achieved as sufficient enough.

When commenting on the individual estimates let's first focus on the indicator of relative income that we assume to be the main explanatory variable. Coefficient for this variable indeed came out to be significant determinant of household consumption behaviour. In line with the assumption we made the value of this coefficient is negative and indicates that rise in relative standings in the income distributions by 1 also lowers the average propensity to consume of given households by something over 10 percentage points. This finding is supported also by the estimation of the alternative model.

Also the variable *group* showed up to have in impact on the households *APC*. Coefficients for four out of six categories are significant. In line with what was expected unemployed, retired and economically inactive have higher propensity to consume than employed. Also being self-employed rises the *APC* compared to being an employee. What we can call as a little surprise is the fact that since coefficients for all groups are positive the lowest propensity to consume a thus the highest saving rate among all categories have employees with lower education which was the reference category.

According the results, households where the head is woman tend to spend more for consumption and proportionally save less. Particularly when the head is a woman we can expect on average *APC* to be approximately 8 percentage points higher compared to the situation where the head is a man. This result probably reflects the fact that men tend to be more saving oriented than women.

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As for the influence of age, our results of positive coefficient for variable *age* and negative for *age²* are exactly the opposite that we expected, indicating not the U-shaped but the reverse U-shaped relationship. This finding is definitely not in line with the life-cycle hypothesis saying that young a very old tend to have higher *APC* while in the middle age people on the contrary save more. However the magnitude of both coefficients is quite low so this effect shouldn't be crucial.

When switching to the model M2 all estimated coefficients have the same sign a similar value which indicates the stability of the estimates. What definitely can be called as a surprise is the fact that coefficients for none of the categories of education of the head of the household came out to be significant (only except the category for bachelor's degree where the p-value is just on the threshold). This means that differences in education do not have an impact on the way households allocate their income into consumption and savings.

4   Conclusion

Let's remind that the aim of this work was to make a little contribution in defining and describing the basic determinants of average propensity to consume of Czech households using the micro-data. Our cross-sectional analysis based on the Household Budget Survey data from the 2015 wave showed up a set of significant determinants of this cross-sectional consumption behaviour. Probably the most influential of them is the relative position of the household in the income distribution measured by relative income. This finding only underlines the importance of this relative measure whenever the comparison is possible (not at aggregate level obviously) and fully supports the "keeping up with the Joneses" hypothesis. Among other significant factors influencing household propensity to consume we can mention age (with the opposite sign than expected), gender and economic status of the head of the household. On the other hand education of the head showed up to by irrelevant which can be definitely called as the biggest surprise of this analysis.

The main idea behind this analysis was to emphasize the difference between consumption behaviour at macro- and micro-level. Many studies still ignore this basic difference and try to apply the same principals on the aggregate consumption function and the consumption of individual units. We showed up that this way is not the right approach. As emphasized by our main explanatory variable of relative income there are aspects that may be very important at micro-level, but still for its nature can't be observed at aggregate level. Of course also the difference between cross-sectional and time-series consumption function must be always taken into account.

However these results are still the preliminary ones. A lot of robustness check will have to be made before it is possible to unambiguously confirm the principles stated above. Moreover relatively low value of coefficient of determination indicates that many influential variables have still remained hidden and so to find them a thus to rise the share of the variability explained is one of the major motivation for extension of this work.

5   Acknowledgement

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DO INTERNAL R & D ACTIVITIES PRODUCE HIGHER TURNOVER? EVIDENCE FROM CZECH'S MANUFACTURING COMPANIES

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Abstract
This paper empirically examines whether Research and Development (R & D) expenditure of domestically-owned companies (DOC) in the Czech Republic differ significantly from R & D activities of foreign-owned companies (FOC) based on an company-level panel dataset. Based on theoretical background discussed in the paper, the hypothesis and assumption formed here is the following: Internal R & D investment has a significantly different importance in increasing the turnover by domestically- or foreign- owned companies. The scientific aim is to find the different significantly between the relationship of R & D investment to the internal research of DOC and FOC. The results reveal the following. Firstly, the FOC spend more R & D expenditure than the independent companies only in Manufacture of machinery and equipment n.e.c. Secondly, there is a strong positive correlation between the turnover and internal R & D activities of DOC. R = 0.81 (CZ NACE 28) and R = 0.70 (CZ NACE 26 and 27). These findings imply that globalization and integration of companies may not only affect turnover and employees but may also have an important impact on the level of domestic R & D activities in the Czech Republic.

Keywords
Correlation, Employment, Innovation, R & D activities, Turnover.

JEL classification
J21, F43, O33, O47

1   Introduction

Innovation policy gets still more importance between the economic policies of member countries of the European Union. In particular, innovation in manufacturing industry are the important parameters for comparing the economies of selected States. The process of innovation is at the core of the Schumpeterian view of economic change whereby successful "new combinations"—new products, companies, processes, markets, and sources of inputs—are introduced, leading to new economic activities, "creative destruction" and entrepreneurial profits protected by temporary monopoly power. As large companies and oligopolistic structures, replace competitive markets, innovative efforts institutionalized in R & D activities, and "technological progress is increasingly becoming the business of teams of trained specialists who turn out what is required and make it work in predictable ways" (Schumpeter, 1911, 1942, 1955, 1976). In this way, (the large-scale establishment) "has come to be the most powerful engine of that progress and, in particular, of the long-run expansion of total output" (Schumpeter, 1942). Increase the competitiveness of individual companies and States as a whole is subject to not only high productivity, R & D expenditure but also by improving the economic and technological performance and by increasing the effectiveness, efficiency and perhaps even the fairness (MacGregor Pelikánová, 2017). The result of the merger and the introduction of technological improvements in the computer industry for the English company were compare with changes for enterprises in the U.S. (Stoneman, 1978). There is also appropriate to mention positive agglomeration effects as result of concentration processes of companies and other institutions. Sectoral industrial agglomerations accelerate the dissemination of information, knowledge, technological processes and practices and innovations enhances efficiency, success, growth dynamics and the competitiveness of the system itself (Turečková, 2018).

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Salveson (1959) has already pointed out in the middle of the last century on foresight in the financing of the costs of learning and progress for the business community. Designed to avoid or minimize a common trend to maximise short-term profits at the expense of ensuring the future of research, development and investment. The results of the two separate studies relating to the industry, investment and productivity, indicated a negative relationship between engineering, research and development activities and the growth performance of industrial companies. There recommended to companies to refine the definition of objectives and policies in the area of research and development as the necessary substantiating documents to achieve return on investment (Hitt, 1985).

Turnover is one of the most important economic variables and how and under what circumstances it create a topic that has long been a matter considerable discussion and scientific research. The relationship between technological change measured by R & D expenditure and turnover is in area of the particular contention. Excluding extreme cases, the growth R & D expenditure and general technical progress, as can also be intuitively grasped from its definition, has the direct effect of increase demand for firms outputs. Therefore, through a number of complementary mechanisms, innovations and technical change have a positive impact of turnover. Increasing the turnover of large enterprises supports the growth of R & D intensity (Bočková and Meluzín, 2016).

Empirical research on the macro-level relationship between innovation and R & D expenditure on the one hand and turnover and employment on the other goes back quite a long time, see e.g. (Sinclair, 1981; Layard and Nickell, 1985). In addition, there are many studies and research from the last century based on microdata. Let us concentrate on studies from European Union. The studies by Brouwer *et al.* (1993) and Zimmermann (1991) using microdata for the Germany and Netherlands, find that increases in R & D expenditure and technical change linked with a decline in employment and increase in turnover or sale of final product. Numerous other studies show a positive relationship between various innovation indicators and employment. A large number of studies used the micro-level data sets for example of the European Union's Community Innovation Survey, and while they generally find a positive link, what many of them focus on is how differences in the type of innovation have different effects on employment. These studies that process innovation tends to have a negative impact on employment, since an important aspect of such innovation is the reduction of costs through saving on factors of production, while products innovation tends to increase firms' turnover and profit and, as a result, is likely to increase the demand for labour (Fukao, 2017). There is a growing value of literature examining the links among a range of companies characteristics, such as innovation activities, employment, total factor productivity (TFP) and companies age. An example is the study by Van Biesebroeck (2005), who examine that larger companies tend to have faster TFP growth. Bartelsman *et al.* (2013) found in his study that larger companies tend to have a higher TFP level than smaller.

Economic growth had a particular pattern in Central and Eastern Europe (CEEC) during the transition period. In the respect, CEEC stand out among other emerging countries, where labour input has typically contributed substantially to growth. Most of the growth was actually accounted by the increase in TFP. Even though the classical source of TFP growth is technical progress and innovation, growth mostly explained by efficiency improvements in the use of capital and labour (Havrylyshyn, 2001). The study by Jude and Pop (2011) show the result that the Czech Republic in the only country with a positive correlation between R & D expenditure and economic performance measured by GDP growth. Slovakia and Hungary show a negative relationship between R & D Intensity and economic growth.

For sustainable business development it is a relevant tool retention of the proceeds in enterprise by sustainable and growing business property in financial (monetary) understanding and physical (material) understanding as well (Pakšiová, 2017).

R & D Expenditure in the business sector in the Czech Republic increased by 2% year on year and reached a record 49 billion CZK. The business sector is the most significant in terms of the

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amount of R & D expenditure, when long term exceeds 50% of the total expenditure on R&D. In the year 2016 even for the first time, exceeded 60% of business share. Primarily foreign–owned companies caused the annual increase. They have, in the framework of the sector, with 64% market share in the last 6 years. This proportion is growing. By contrast, the value of R & D department occupy only one-quarter the share of foreign companies. It is obvious that among the foreign-owned companies include large companies with high R & D expenditure. In the year 2016 had 88 companies in the Czech Republic the annual R & D spending more than 100 million CZK, of which the foreign owner had 65 of them (CZSO, 2018).

The remainder of this study is organize as follows. Section 2 explains the data we use and the construction of variables and presents our methodology and data transformation. Section 3 then examines the link between R & D internal expenditure and turnover and employment changes. Finally, Section 4 summarizes our results and discusses for future research.

2   Methodology and data

We have established in the previous part that R & D expenditure and the increase of a turnover is taking an important place in a measurement of an economic performance in the advantage economics. The research question we addressed is the existence of a statistically significant difference between the R & D expenditure of the domestically owned and the foreign-owned companies. The panel data we used from the Annual Research and Development Report. This report treats the Czech Statistical Office. It has an annual frequency and is available for the period 2014 – 2016. The report is mandatory for all research and development workplaces of economic subjects - legal and natural persons registered or not registered in the R & D.

Table 1. List of variables

Variables	Description	Unit
ALL 26&27	All large companies with the primary code NACE 26 and 27 innovative in the years 2014-2016	
DOC 26&27	Domestic-owned large companies with the primary code NACE 26 and 27 innovative in the years 2014-2016	
FOC 26&27	Foreign-owned large companies with the primary code NACE 26 and 27 innovative in the years 2014-2016	
ALL 28	All large companies with the primary code NACE 28 innovative in the years 2014-2016	
DOC 28	Domestic-owned large companies with the primary code NACE 28 innovative in the years 2014-2016	
FOC 28	Foreign-owned large companies with the primary code NACE 28 innovative in the years 2014-2016	
RRDINT	Innovative activities - internal research, 2014	
TURN14	Turnover (operating revenue), year 2014	Th CZK
TURN16	Turnover (operating revenue), year 2016	Th CZK
EMP14	Number of employees in 2014	
EMP16	Number of employees in 2016	

Source: CZSO, VTR 5-1, 2016.

Registry regardless of whether they are their main or secondary economic activity. Business entities in the business sector and the private non-profit sector-serving households complete the mutation, and the b mutation is for the government sector, the university sector and the faculty hospital. Intelligence units receive information on their reporting obligations in a notification sent by the Czech Statistical Office. (CZSO, 2018). For the construction of the ratings, we used the volume of innovation activities on internal research, expressed in CZK, the achieved turnover of enterprises

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in the years 2014 and 2016, number of employees in the years 2014 and 2016. For definition of variables, see Tab. 1.

In the case of sectoral focus will spend the most money on R & D activities in companies operating in the manufacturing industry, over the last 10 years it is always between 50 - 55%. In the manufacturing industry are the most important sectors of the automotive, engineering and electronics industry, when the cost of manufacturing industry involved in about 60% of the total expenditure on the corporate sector is their share of more than 30% (CZSO, 2018). We chose only the companies from NACE 26 - Manufacture of computer, electronic and optical products; NACE 27 - Manufacture of electrical equipment and NACE 28 - Manufacture of machinery and equipment n.e.c. In the statistical dataset were selected only large enterprises. Manufacture of computer, electronic and optical products and Manufacture of electrical equipment are represent by 48 companies, including 40 limited liability companies, 7 joint-stock companies and 1 manufacturing cooperative. Manufacture of machinery and equipment n.e.c. represents by 69 companies, including 33 limited liability companies, 33 joint-stock companies, 1 state enterprise and 1 limited partnership.

Data transformation done due to the large variance of the original data in a statistical set. This transformation changes the distribution of data, was used for data modification, we approached the multidimensional normality. For non-linear transformations, we used: Logarithmic transformation

$$y_{ij} = \log_c x_{ij}, \tag{1}$$

where x_{ij} is the value of the variable j for the i-th object and the $\log_c$ is logarithm (c), it being generally used base-10 logarithm ($c = 10$) or the natural logarithm ($c = e$, where e is Euler's number).

3   Empirical results

All large companies with the primary code NACE 26 and 27 innovative in the years 2014-2016 were evaluated as the industry overall. Statistical set also evaluate separately for domestic-owned companies and foreign-owned companies. The normality of the data processed by the program STATISTICA 12. Data transformed due to disorder. Transformation done by logarithm. Once the modification done, the data could processed statistically. For a detailed descriptive statistic for the entire industry and individual groups of the companies, see Tab. 2. Of the identified data, see table 2, it is clear that R & D investments in internal research brings increase in turnover, in particular in foreign-owned companies. Domestically owned companies after two years of R & D expenditure increased the mean pursued turnover about 99,411 CZK. Foreign controlled companies increased mean of the turnover of 466,920 CZK. The domestic-owned companies in division: Manufacture of computer, electronic and optical products and Manufacture of electrical equipment increased the average number of employees by 28.13. Foreign-owned companies were better employers. The increase of the average number of employees was over 34 employees.

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Table 2. Descriptive statistics for NACE 26 and 27

Variables	ALL 26&27; Number 48				
	RRDINT	TURN14	TURN16	EMP14	EMP16
Mean	3.9038	6.2178	6.2694	2.7719	2.7991
St. Dev.	0.9465	0.5236	0.5385	0.3740	0.3656
Median	3.9419	6.1778	6.2664	2.6883	2.7445
Spikiness	0.3369	0.6305	0.3930	1.5439	1.3704
Skewness	-0.533	0.4223	0.3738	1.3269	1.3145
	DOC 26&27; Number 15				
	RRDINT	TURN14	TURN16	EMP14	EMP16
Mean	3.7889	6.0002	6.0356	2.7405	2.7659
St. Dev.	1.0571	0.5174	0.5299	0.3478	0.3273
Median	3.8431	5.8771	5.8550	2.6972	2.6972
Spikiness	-0.0332	-0.1494	-0.2601	0.3446	1.2179
Skewness	-0.3856	0.5422	0.6948	0.9923	1.2479
	FOC 26&27; Number 33				
	RRDINT	TURN14	TURN16	EMP14	EMP16
Mean	3.9561	6.3168	6.3757	2.7862	2.8142
St. Dev.	0.9039	0.5044	0.5156	0.3897	0.3856
Median	3.9477	6.2164	6.3029	2.6794	2.7551
Spikiness	0.8463	1.3772	1.2728	1.9187	1.4256
Skewness	-0.6085	0.5088	0.3816	1.4459	1.3325

Source: Authors own calculations.

The more innovative sector is the NACE 28 division. The statistical sample includes 48 companies. For descriptive statistics of this statistical set, see Tab. 3. Foreign-owned companies increased the mean of the annual turnover of 378,451 CZK when 20% of companies experienced a decrease in operating revenue. Domestically owned companies decreased the mean of the annual turnover of 16,014 CZK when 48% of companies experienced a decrease in operating revenue. The number of employees increased by 8.38 employees (domestically owned companies) and by 42.18 employees for foreign-owned companies.

Table 3. Descriptive statistics for NACE 28

Variables	ALL 28; Number 68				
	RRDINT	TURN14	TURN16	EMP14	EMP16
Mean	3.9780	6.0560	6.1604	2.6988	2.7159
St. Dev.	0.8459	0.8102	0.3402	0.2129	0.2120
Median	4.1065	6.1176	6.1455	2.6932	2.7339
Spikiness	2.2841	47.9107	0.3637	0.3628	0.0786
Skewness	-1.1341	-6.3372	0.6136	0.7256	0.5874
	DOC 28; Number 29				
	RRDINT	TURN14	TURN16	EMP14	EMP16
Mean	3,7349	6,0444	6,0196	2,6950	2,6920
St. Dev.	0,9392	0,3253	0,3186	0,2589	0,2552
Median	3,7308	5,9731	5,9844	2,6522	2,6273
Spikiness	2,6261	0,4855	1,7576	-0,1915	0,4766
Skewness	-1,3795	0,6224	0,9947	0,8490	0,8292
	FOC 28; Number 39				
	RRDINT	TURN14	TURN16	EMP14	EMP16
Mean	4.1588	6.0646	6.2650	2.7015	2.7338
St. Dev.	0.7300	1.0389	0.3208	0.1748	0.1746
Median	4.2629	6.1511	6.2004	2.7101	2.7520
Spikiness	-0.1402	32.5794	0.3459	0.8799	1.5029
Skewness	-5.4598	0.6223	0.62233	0.4309	0.3853

Source: Authors own calculations.

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R & D expenditure, as mentioned in the introduction, is it seen as an impetus for company development. The next step in our research was the calculation of the correlation between R & D expenditure and turnover. For the results of statistical reporting of all large companies in Divisions NACE 26 and NACE 27, see Tab. 4. There was find a slight positive correlation between R & D expenditure in 2014 and turnover in 2014 and 2016.

Table 4. Correlation coefficients for NACE 26 + 27 (ALL)

Variables	RRDINT	TURN14	TURN16
RRDINT	1		
TURN14	0.444	1	
TURN16	0.512	0.989	1

Source: Authors own calculations.

The situation with domestically- and foreign-owned companies in this division is different. For the correlation coefficients between two groups of companies, see Tab. 5. The correlation coefficient is slightly positive for R & D expenditure and turnover achieved in 2014. The correlation coefficient is 0.542 for domestically owned companies, or 0.515 for foreign-owned companies. The interdependence between R & D internal investments shows a greater leak in R & D expenditure for 2014 and turnover in 2016. The domestically owned companies showed R = 0.704. Foreign-owned companies only have a slightly positive correlation coefficient, R = 0.569.

Table 5. Correlation coefficients for NACE 26 + 27 domestically- and foreign-owned companies

Variables	RRDINT	TURN14	TURN16
	DOC 26&27		
RRDINT	1		
TURN14	0.542	1	
TURN16	0.704	0.974	1
	FOC 26&27		
RRDINT	1		
TURN14	0.515	1	
TURN16	0.569	0.999	1

Source: Authors own calculations.

There are 48 innovating enterprises in the NACE 28 division. More than half belong to foreign owners. For the results of the correlation between R & D internal expenditures and turnover in 2014 and 2016 see Tab. 6.

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Table 6. Correlation coefficients for NACE 28

Variables	RRDINT	TURN14	TURN16
	ALL 26&27		
RRDINT	1		
TURN14	0.577	1	
TURN16	0.541	0.970	1
	DOC 26&27		
RRDINT	1		
TURN14	0.749	1	
TURN16	0.807	0.964	1
	FOC 26&27		
RRDINT	1		
TURN14	0.517	1	
TURN16	0.445	0.976	1

Source: Authors own calculations.

Table 6 shows the correlation coefficients of the different variables used in the estimation. The table indicates that regardless of the estimation period, when looking at simple correlations, there is a significant positive correlation between R & D internal expenditure and turnover. Most positive correlation is by domestically owned companies. We publish the estimation results of the change of employment for the electro technical and engineering industry in Table 7.

Table 7. Correlation coefficients for change of employments for division NACE 26&27 and 28

Variables	NACE 26&27	NACE 28
	ALL	
RRINT x CHEMP	0.329	-0.097
	DOC	
RRINT x CHEMP	0.356	0.068
	FOC	
RRINT x CHEMP	0,358	-0.322

Source: Authors own calculations.

Starting with the result for the electrical industry in panel, we find that the correlation coefficient is positive only and no significant in all specification, indicating that if companies invest R & D expenditure, the labour shortage variables take a positive value. On the contrary, the companies in the engineering industry indicating that if companies have surplus labour (i.e. the labour variables take the negative value), companies foreign-owned companies gradually decrease employment over the following 2 years.

4 Conclusion

In this study, using microdata from the Annual Research and Development Report, we empirically examined the relationship between R & D internal expenditure, turnover and employment at Czech companies for the period 2014-2016. Our mind finding can be summarize as follows:

The first, in the Czech companies in selected division of manufacturing industry, there are many large companies with R & D internal expenditure. Secondly, the extent of excess labour tends to be more pronounce at domestically owned companies in division NACE 28. In third place, if companies expect to innovate in electrical industry, they increase their employment.

Fourth, our calculations have shown that R & D investment in internal research increases the turnover of companies in the coming years. The correlation coefficients are significantly positive for all groups of enterprises in selected industry sectors. There is the most significant correlation between domestic enterprises. Fifth, while we observe a negative correlation between R & D internal

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expenditure and their change of employment, turnover through innovation activities has a positive impact. The globalization and integration of companies may not only affect turnover and employees but may also have an important impact on the level of domestic R & D activities in the Czech Republic.

Finally, a few caveats are in order. Although we tried to conduct our analysis as accurately as possible, a number of issues remain that should be examined in the future. One such issue is that it is necessary to more carefully control for simultaneity biases that likely exist between R & D expenditure, turnover, employment and for example capital investment or productivity growth.

5   Acknowledgement

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ANALYSIS OF THE AVAILABILITY OF HOUSING IN THE CZECH REPUBLIC AND THE EU

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Abstract
The article deals with the comparison of the housing affordability for common residents especially in the Czech Republic, followed by comparing common households in the European Union. This availability is being investigated over time and how these conditions have changed for the population over the past 10 years. The article also deals with the research and comparison of the factors influencing these conditions of housing affordability and how they have changed during that time. The purchase of real estate is connected with the possibility of conservative preservation of the capital, but primarily serves for own use of housing. An alternative to buying property for their own housing is the lease of the property, which citizens are forced to use when they are not able to buy their own housing. The aim of the article is to compare real estate prices and wage developments in the Czech Republic.

Keywords
Average wage, Household income, Inflation real estate price, Interest rate.

JEL classification
E42, E43, E58, G15

1 Introduction

The housing affordability in the Czech Republic is still lagging behind the European Union, although the mortgage loans in the Czech Republic are curently the cheapest in the history and also are among the cheaper ones in comparison with the other EU countries. But the Czech Republic loses its purchasing power. In comparison to other states of the Union even the cheap mortgage is expensive for a Czech citizen with an average earnings. The financial availability of ownership housing has gradually become a standardized form of operationalization of housing assessment in most developed market economies. Own housing in the Czech Republic is becoming less accessible. It is the result of rising prices of residential properties, constraints of mortgages by the ČNB and high demand for new housing. In the real estate market, we can currently observe a certain turnover. Numbers of mortgages are beginning to decline and real estate prices are slightly slowing down. (Lux, 2002)

It is not the fault of falling demand. Tharea are more people who want to move into their own property than properties for sale. This overhang is the most obvious in the capital city Prague. However the flats have been expensive for more and more people. Nowadays in the Czech Republic there are the worst-available flats ever in Europe. The problem is not in the apartment prices themselves. These are considerably higher in many European cities. However, Czech wages lag behind the rise of property prices. While Czech employees' earnings are growing rapidly, the availability of housing is getting worse. Apartment prices are rising even faster than wages, and the rising of interest rates on mortgages also have their share. In the Czech Republic, apartments are expensive compared to income, even if we look abroad. For example, in neighboring Germany, it is enough for an average flat to earn an average wage by more than a half shorter period.

2 Literature review

The often quoted definition of financial affordability of housing states that the availability refers to the provision of a certain standard of living (or different standards) at a price or rent that in the eyes of a third party (usually governments) does not represent an unreasonable burden for household income. (Maclennan et al., 1990)

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The financial availability of ownership and rental housing is most often measured by the indicator of the proportion of housing costs which the household has to spend on acquiring and maintaining its (or adequate) housing and net household income. For the owners' housing is also used an indicator of the number of savings years for the household to acquire a property of a reasonable household size. For a sector of rental housing is the proportion of housing costs to net household income further monitored by either the rent-to-income ratio/housing expenditures-to-incoe ratio or by the indicator of the residual income ("residual income"). Garnett and Perry (2005) distinguishes three basic approaches to the analysis of housing affordability: an indicator approach, a reference approach and a residual approach. The indicator approach uses indicators measuring the cost of housing expenditure, and when estimating the limit, it estimates the housing affordability for the population in general or for individual social groups. At the end of the 19th century people often mentioned the rule: the weekly wage is equal to the monthly rent. This created the widespread idea that rent should not exceed 25% of household income (Garnett and Perry, 2005). The reference approach does not specify excatly the limit value of the level of the burden but refers to the situation either in another housing sector (eg. rent should be set at the level of rent in private rental housing) or the need to provide housing to a some group of residents (eg. rent sould be set in such a level so that employees with low wage can afford it). The residual approach, which is based on the residual income indicator, then tries to measure the amount of household income after deducting housing expenses.

Like in both previous approaches, the normative question will emerge again: Is the residual income left after deduction of housing costs sufficient to cover all other necessary living needs? The normative aspect of purely financial, and to a certain extent, simplifying housing accessibility analyzes is based in particular on the fact that housing (and in particular ownership) is a durable commodity and such as is expensive, given to the regular income of the household and in comparison with other goods. According to Hulchanski (1995), indicators of housing affordability are used in six different ways: a description of development, a statistical analysis, administration of public budget support, a definition of housing needs in a given country or location, a prediction of the ability to meet its obligations concerning rent or repayment of the mortgage loan and a selection criterion. The first three ways are classified by Hulchanski as "relatively valid" (475), the rest are on the contrary invalid and unauthorized use. Indicators can be used to describe, compare, statistically analyze and ultimately to test housing policy tools (eg. housing allowance) but can not be used for a subjective definition of housing needs in a country or municipality (for too general "planning" housing construction concept) or for the purpose of predicting the ability to pay rent or mortgage obligations in the future (as no one can predict future conditions). All of these approaches to measuring the housing affordability also have to cope with methodological issues such as:

- the low burden of housing expenditure can be the result of a very low quality of housing;
- the reference category or residual income very little reflects the actual living conditions of those who are above the set limit value;
- since housing is a very heterogeneous commodity, a pure analysis of housing expenditure does not include not only the quality of housing itself but also factors such as the protection of tenancy rights, costs resulting from the availability of various cultural and health facilities, commuting costs etc. (Hulchanski, 1995).

For these reasons, accessibility indicators tend to be modified in a variety of ways, but in spite of their widely discussed shortcomings, the indicator of the cost of housing spending (however modified) remains a key measure of the housing affordability in all EU countries.

3   Methodology and data

For the analyzes are used mainly secondary data from the databases of the Czech National Bank and of the Czech Statistical Office, which were examined for their interdependencies and links, especially between average wages and real estate market prices in the Czech Republic. These indicators are then compared with other EU countries. The analysis results then define the current state with the

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prediction of further development. The data was processed in MS Excel 2010. The data reviewed were for the period from 2008 to the first quarter of 2018.

3.1 Definition of "wages" index

It is about average gross monthly wages, ie. before the reduction in general health and social security premiums, advance payments of personal income tax, and other statutory or employee-agreed deductions. There are included amounts charged in a given period, regardless of whether they were actually paid to employees or not. The average wage is monitored for the registered number of employees.

The source is data from the Czech Statistical Office. The data contain data from the civil sector of the national economy of the Czech Republic (ie. without part of the Ministry of Defense department, Ministry of the Interior). Furthermore, there are not included data for some other non-statistically monitored economic entities, persons exercising public functions (deputies, senators, deputies, judges etc.). The data are based on the survey of the average monthly wage, converted into individuals by economic entities

- with 20+ employees (non-financial corporations and corporations, employees of natural persons in the Commercial Register),
- regardless of the number of employees (financial institutions and corporations, insurance companies, government institutions and non-profit institutions serving households).

Quarterly and whole-year data were processed using the enterprise method. Data is classified into the industry according to Sectoral Classification of Economic Activities. The average wage is stated in nominal terms in CZK. Nominal wage index is expressed as a percentage compared to the same period last year.

The method of calculating <u>the average monthly wage</u> absolute in CZK = share of wages without other personnel costs (in thous. CZK) and the average registered number of employees divided by three, times a thousand. <u>Nominal wage index</u> = share of the average monthly wage in the reference period of time and average monthly wage in the same period last year, times a hundred.

The average wage, and the nominal and real wage index, are listed and calculated for economic entities:

- a) of the business sphere
  - from a year 2008 and with 20+ employees, included employees of natural persons in the Commercial Register,
  - in the financial sector, regardless of the number of employees;
- b) non-business spheres, ie. employees of all organizations wholly or partly funded from the state or local budget and non-profit institutions. (CSO, 2018)

3.2 Definition of "property prices" index

Real estate prices are actually paid, respectively admitted prices, for which are made the transactions with apartments, family houses, apartment buildings and building plots, both existing and newly built. The data are collected by the Czech Statistical Office from tax returns and from data from realtors, developers, cadastral and building authorities.

Prices of the so-called monitored real estate types (flats, family houses, apartment buildings, building plots) are defined as the average purchase price per 1 m2 that was declared in tax returns (extreme values are excluded). All transactions executed during the reporting period are included. Price indexes are calculated on the basis of the Laspeyres formula and are based on national definitions of indexes.

The housing price index (HPI) is compiled according to a European harmonized methodology (agreed between Eurostat and the ECB) based on the "gross acquisition approach" and includes all residential housing transactions implemented both within the sector (between the population) and the population and other relevant sectors.

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The owner-occupied housing price index (OOH Index) is compiled according to the European harmonized methodology (agreed between Eurostat and the ECB) based on the net acquisition approach and includes all housing transactions of the population carried out in relation to the population and other relevant sectors aimed at acquiring own housing. Data is compiled in quarterly periodicity.

Prices of monitored property types are divided into:
a) Apartment prices.
b) Family house prices.
c) Prices of apartment buildings.
d) Prices of building plots.

The housing price index (HPI) is devided into:
a) Purchase price of new apartments.
b) Purchase price of existing apartments.

The owner-occupied housing price index (OOH Index) is devided into:
a) Costs linked to the acquisition of own housing.
b) Costs linked to the holding of own housing. (CSO, 2018)

The used methodology is a combination of qualitative and quantitative analysis. The qualitative component of the research is represented by the findings of economic theory, which are then compared with the current way of managing the most important world economies. And the quantitative component is based on economic data that were taken from the Eurostat database.

4   Empirical results

A whole spectrum of subjects invests into the real estate. In the first place, it can be end users (households) who purchase them for their own needs and housing. An inseparable part of the real estate market are also small and large investors or businesses that store their assets both in terms of value preservation and current income in the form of rents. Investment in real estate should be one of the long-term stable investments. However, even in this segment, it is possible to meet large, sometimes unexpected, fluctuations in terms of their immediate value. For example, increase in housing demand generates an increase in real house prices and in labor used in the construction sector. The decrease in the interest rate prompts an increase in the price of structures since the structures sector is more labor intensive. (Franjo, 2018)

If we look at the first group of buyers of real estate for their own housing needs, it is necessary to examine both the development of property prices, but also the development of the income of this group, which is wages.

4.1   Analysis of Real Estate Prices development

The price of apartments in the last two years has grown significantly, not only in the segment of new buildings. Also the value of older flats went up quickly. Most recently it has been manifested in panel houses in Prague's housing estates. However, house prices have also risen.

In the case of new constructions, the structure of development projects has a large impact on price growth. While in the past developers were building more on the outskirts of Prague, today the construction is concentrated mainly in the wider center of the metropolis. This is reflected in the final prices.

According to common statistics by Trigema, Central Group and Skanska Reality, the average price of new apartments sold in the capital at the end of 2017 rose by 19.6% year-on-year to CZK 83,150 per square meter. (Aktualne.cz, 2018) For the first time ever, the limit of CZK 80,000 per square meter was exceeded. This is largely due to the fact that developers sell apartments in more expensive projects.

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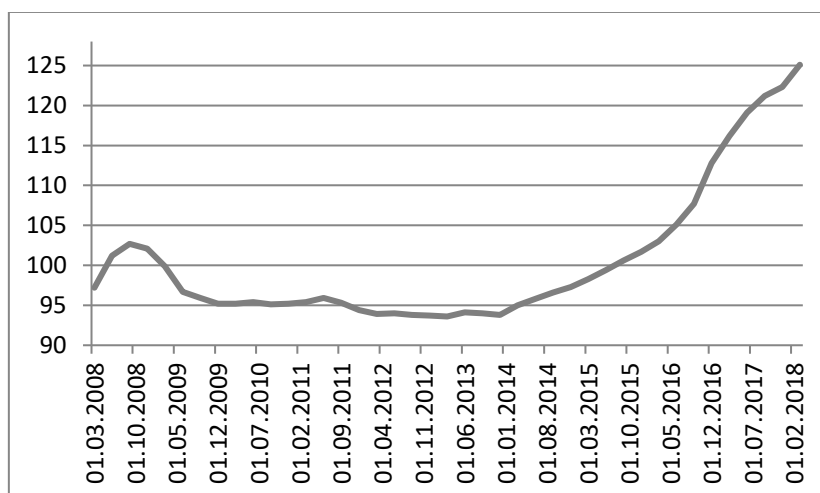
Fig. 1. Price index of real estate 2015 = 100 (Source: CNB, 2018)

Figure 1 shows that current price growth has already surpassed a large percentage of growth in property prices prior to the global crisis in 2008.

Price increases also support high demand for investment apartments that people buy to lease them subsequently. Increasingly, they are choosing a form of short-term lease in the form of Airbnb, from which they expect higher returns. This, however, according to experts, brings negatives to the real estate market. There is currently a shortage of offers of smaller apartments up to 50 square meters for long-term rent. High demand rises rents again. It plays cards again to people who want to rent and thus can achieve a higher yield. This situation with a shortage of flats on the market just can not to be mend quickly. Developers, amongst other things, are not able to get enough new projects due to lengthy licensing processes. The last two years they have largely benefited from their stocks from previous years. Now, however, they often have nothing to take on, and this is reflected in sales.

In the third quarter of 2017 in Prague were sold only 1,200 apartments. This is about 250 less than the same period in 2016. In 2018, they are estimated to be able to sell about 1,000 apartments less than in 2017, since 6,650 new apartments were purchased on the market. Some companies, that have only been active on the Prague residential market, are heading to other cities.

4.2 Analysis of wage developments

Buying property for their own housing largely affects income. For the definition of housing affordability it is therefore necessary to analyze wage developments in the Czech Republic, which can be after that compared with developments in real estate prices.

In terms of wages, the year 2018 started to grow strongly as expected. The average salary, which according to the CSO presents CZK 30,265, increased in the first quarter of 2018 nominally the same period last year by 8.6 %, which is the highest increas for this time of year since 2008.

Real wages from the beginning of 2014 to the third quarter of 2016 almost copied nominal wage developments, as inflation (consumer price index) was only around half a percent level, which resulting in a rapid increase in the real purchasing power of wages even in a weaker nominal growth. With the coming of the year 2017, the price increase exceeded the CNB's inflation target (2%) and the development of nominal and real wages began to differ significantly. In the first quarter of 2018 inflation fell slightly to 1.9% and therefore wages grew year-on-year in real terms up 6.6%. This coincidence of lower inflation and strong nominal growth was the result of the highest index since Q1 2003 when the average wage rose by a further two tenths of a percentage point more. (Holý, 2018)

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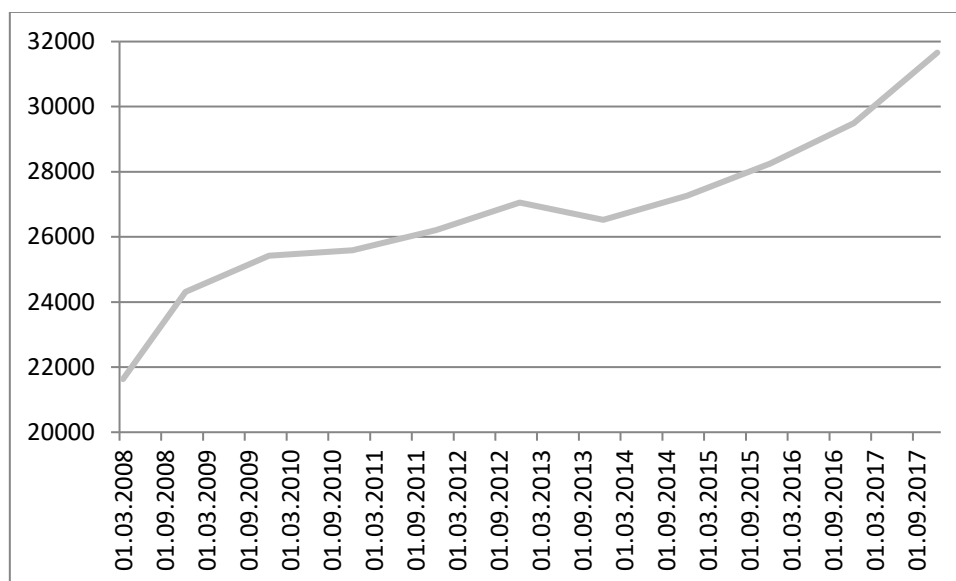
Fig. 2. Development of nominal wages (Source: CSO, 2018)

Similarly to the development of number of employees, in Q1 2018 wage growth was differentiated by sectors (see Figure 2). Nevertheless, there were no drops in levels, year-on-year nominal increases ranged from 3.5% to 13.1%. The rise in average wages is most visible in the sectoral sections where the state was dominant. This is true for cultural, recreational and entertainment activities, where the average wage increased most (by 13.1%) to CZK 26,497, education (by 12.6%) to CZK 28,425, similarly in public administration and defense (by 12.5%) to CZK 33,857, and last but not least for health and social care (by 11.8%) to CZK 31,747.

Market sectors in this direction somewhat halting, in which the fastest wage growth in the sector real estate activities (by 8.9%) and transport and storage (by 8.6%). In trade and repair (wholesale and retail, repair and maintenance of motor vehicles) the average wage has already risen below average (by 8.4%).

In the industrial sectors, wage growth was 7.5%, in agriculture, forestry and fisheries slightly less (7.1%). The lowest increase was in financial and insurance sector, where, however, employees with an average wage of CZK 55,234 remain in terms of wage levels in the second place. And the best paid employees are in the information and communication activities sector with CZK 56,822. (Holý, 2018) Wage growth in the first quarter of 2018 did not indicate a lower number of worked hours and, on the contrary, a higher volume of paid unworked time. The share of overtime was comparable to the last year.

4.3 Comparison of property price development and wage development

According to the analyzes, there is an upward trend in both property prices and average wages. Therefore, it is necessary to compare these two indexes together and describe their relationship. For the sake of clarity, only their indices are examined, namely their change in the reference period with the same period last year. These indexes were then converted to their percentage changes and displayed in one chart – Figure 3.

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Fig. 3. Comparison of wage and real estate development indices (Source: own proces from CSO, 2018 and CNB, 2018)

Figure 3 shows a comparison of average wages and property price indices, which are converted to their percentage. It is clear from this graph that at the beginning of 2008, when these percentages were almost identical, average wages grew much higher than real estate prices, and this was in the run-up to the global crisis when real estate prices also experienced a significant increase.

Furthermore, both monitored indices record significant decreases since 2009, which are almost identical. For average wages, these declines are somewhat more significant, but due to the significant growth of 2008, they created a sufficient margin to ensure that approximately the same level of financial availability of the real estate purchase.

This trend began to change in 2013 when property prices began to grow more significantly. At the end of 2014, the real estate market recorded a similar scenario as at the end of 2007. Most of the funds began to fall, but with the exception that in 2007, when interest rates reached almost 6% pa, they were now below 2.5 % pa. That's why not only investors, but also households and businesses, have started to move their assets into real estate. This extreme demand almost "sold out" the entire property market and began to push real estate sales prices up sharply. And this trend still has continued despite the various interventions of the central bank. In contrast, wage increases decreased slightly in 2013, and despite the upward trend in 2014, this rising trend was not as significant as it was for real estate.

The break-even point of this comparison comes in early 2016, when the increases in average wages from previous years, which were still higher than real estate price increases, were appealing. And since 2016 real estate prices have seen a much faster growth than average wages.

By the end of 2017, this trend persists, despite the very low unemployment rate and therefore the faster growth rate of average wages. This difference in increments is almost 15%, which is a very significant indicator of declining opportunities for buying the same types of real estate.

5   Conclusion

While monitoring the development of housing prices, mortgage and household income, the trend indicates a further deterioration of the situation. Buying an average flat is now more difficult for the Czechs than at the beginning of 2009, when the average interest rate on mortgages by Fincentrum Hypoindex was just below the limit of six percent. In February this year the average interest rate on the newly sold mortgage was 2.36 percent. The worse accessibility of housing is due to the rising of apartment prices. While in February last year the average bid price of apartments in the Czech Republic was 2.39 million crowns, this year it was almost 400 thousand crowns more, which is about 16 percent more. Together with the growth of interest rates, this is a very bad situation, which has a

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negative impact on the availability of ownership housing in the Czech Republic. The result is, that last year the average Czech households were able to buy a flat with an average price of 2.39 million crowns for less than six times (5.85) the net annual income. This year, with price of flat 2.78 million, it is more than 6.5 times the net annual income. The pace at which this indicator has grown since mid-2016 is unprecedented. And far from this, not only the rise in prices in the capital is playing the role. Quite the contrary. In Prague the growth rate of bid prices of flats has slowed down in recent months. The largest year-on-year growth was monitored in the Olomouc and Pilsen regions and in the Vysočina region (in February). The only region where the fall in prices in the year-on-year comparison - by three percent - is the Karlovy Vary Region. The Karlovy Vary Region, together with the Hradec Králové Region and the Zlín Region, belongs to the only three regions where the availability of housing has improved over the last year. The net income of households, calculated on the basis of the data of the Czech Statistical Office, exceeded the impact of changes in apartment prices in these regions. At the same time, the average for the whole of the republic is considerably rising by situation in Prague, where apartments are the worst available. The average cost of the Prague apartment is more than 11 times the average annual net income of the Prague household. On the contrary by far the most affordable is housing in the Ústí nad Labem Region where only more than twice the average annual net income is sufficient to acquire an average flat.

As far as the availability of housing is concerned, taking into account the prices of mortgages, it is necessary to recalculate how much the average Czech household spends on a monthly mortgage payment every month. Even in this case, the situation is getting worse. The nationwide index rose to 42 percent in February. A year ago, it was 35.7 percent. This means that the average Czech household will pay an average mortgage for an average apartment of CZK 420 per one thousand crowns of net income.

In addition to rising housing prices, rising interest rates also play a role. The average bid rate rose year-on-year from 2.05 to 2.57 percent. There are also great differences between regions. Again, mortgage housing is the worst available in Prague and most accessible in the Usti region.

Also, the international comparison confirms an unpleasant trend for the Czech Republic. The Czech Republic in the last year's ranking, based on the data in 2016, for the first time in its history rose to an unwanted first place, which means that the housing from the countries of comparison is the worst available. An average apartment of 70 square meters in the Czech Republic has value of 10.9 average gross annual salaries, which is almost the entire annual salary more than in Britain, which is on the second place. New property prices in the Czech Republic are now mainly due to the decreasing stock of developer projects and vacant apartments for sale significantly higher than in neighboring Poland or Hungary. At the same time, we still have relatively low wages in the European comparison. The most affordable new apartments can be found in the Netherlands, where a 4.4 times the year salary is enough to buy a new flat. The Dutch are followed by Germans, Spaniards and Belgians who earn about five years for the apartment. (Mesec.cz, 2018)

Outlook for the next months remains unfavorable. Interest rates are gradually rising. It is very difficult to predict the development of interest rates a year or two in advance. However I dare say, that rates will not be greatly reduced in the coming years. They do not have a place. They are still so low that they are more likely to grow than the decline. Growth should continue also with housing prices. In the coming months, or this year, we can not expect a real trend change yet. And we can still expect real estate price growth, albeit slower than in previous years. The correction and turn of the trend could be touched by the years. When exactly this will be can not be guessed.

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PERCEPTION AND ATTITUDES OF CITIZENS TOWARDS THE ISSUE OF POVERTY IN THE MICROREGION OF KARVINÁ

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Abstract
The topic of the contribution is the current perception and attitudes of citizens towards the issue of poverty in the microregion of Karviná. In its theoretical part, the text describes the current issue of poverty within the European Union, concentrating on the Czech Republic. It is primarily a presentation of current causes that may lead to poverty in European society. Further space is also devoted to preventive instruments of poverty in the Czech Republic. In its second part, the contribution presents us with a research that was accomplished and evaluated in 2017. The aim of the research is the perception and classification of the living standard of the population of the microregion of Karviná along with their attitudes towards the social demographic groups that are threatened by poverty and social exclusion. The results of the research are remarkable in the way that not always they proved the theoretical conclusions and stipulated theories. In its final part, the contribution summarises the most significant findings from the theoretical and research section.

Keywords
Living standard, Poverty, Research, Social exclusion, Social policy.

JEL classification
A14, D91

1   Introduction

Poverty is a broad issue that influences the socialization of a human, which is basically the status of an individual within society. Poverty restricts the human in all spheres of life, mainly in regard to its social relations which results in its isolation from the society. It may involve restricted contacts with friends, limited choice of education resulting in limited chances and opportunities at the job market. In another sphere of life, poverty may cause limited chances of holiday or comfort of living and home facilities. At the same time, the life in poverty forms opinions and attitudes of people and thus influences the society, mainly through the political environment of the country by means of the elections (Žižková, 2015, p. 121). According to Tomeš (2001), the perception of poverty under the European conditions is a result of the Christian influence as well as the ideal of equality that originates according to the author mainly in the period of socialism.

According to Žižková (2015, p. 122), there are three main categories of the causes of poverty: low incomes from work, unemployment and a gap as far as the possessed wealth is concerned. These causes of poverty are related to two diverse approaches to their solution. The first approach assumes that individuals have only a very little chance of influencing their situation. It is due to the shortage of vacancies and a high level of unemployment. It is thus expected that poverty will be dealt with and financially moderated by the state. The second approach assumes that poor people are to be blamed for their poverty as they are not sufficiently hard-working, assertive or adaptive. So, it is left up to the poor people alone to solve their situation, the state is not involved in any way. Both approaches are extreme, and they should be mutually interconnected while putting in practice so that the final approach is balanced. It all then depends on the individual countries which approach they favour (Krebs, 2015).

Over thirty million people in the European Union live at the poverty line. Bulgarians, in particular, suffer from a material shortage. On the contrary, only one per cent of the population is threatened by poverty in Sweden. The Czech Republic ranks ninth with 4% (Tancerová, 2018). According to the research by Eurostat, approximately 33 000 000 people in the European Union are severely materially deprived. Those who cannot afford at least 4 out of 9 items that are according to the authors essential for an adequate living standard are threatened by poverty. The items include a telephone, a car,

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a washing machine, a TV, warmth, paying bills in time, facing unexpected expenses, a week holiday away from home and eating meat (or its vegetarian equivalent) regularly. In the European Union, there were 6,7% of the above-mentioned people in 2017, which is merely two per cent less than in 2010. The situation of any country deteriorated except for Denmark where the number of materially deprived persons increased by half per cent (Tancerová, 2018).

2   Methodology

In the present modern society, we are confronted with terms such as material deprivation, energetic poverty, relative and subjective poverty. It is related to the needs of the population and the present living standard that is conditioned by the economic, social and political factors. The economic prosperity and political will, in particular, may provide its citizens with a higher level of living standards and control it in a positive way (Buryová, 2015). It is also related to the social policy that protects its citizens via a system of social security against absolute poverty (minimum wage, living and existential minimum, etc.). In the contribution, theoretical foundations are mentioned dealing with opinions of experts on the social policy, specifically discussing the contemporary issue of poverty.

Up-to-date statistical data on the poverty situation in the EU countries from electronic sources were used and compared. In the second part of the contribution, the research performed in the microregion of Karviná in 2017 is presented. The aim of the research is to present the perception and classification of the living standard of the population of the microregion of Karviná along with the attitudes of people towards the social demographic groups that are endangered by poverty and social exclusion. Considering the aim of the research, the quantitative type of research was chosen, applying the method of interviewing by means of a questionnaire. In the final part of the contribution, the results from the field research will be contrasted with the theoretical views of the authors´ publications.

3   Poverty as a social issue

No exact definition of the term poverty exists. It is predominantly due to the fact that the term poverty itself is ambiguous. Poverty is always perceived individually, and thus it is perceived by an individual depending on their own sense (Krebs 2015). That is why the term poverty is not defined exactly and each author interprets it according to their own perception. For example Žižková (In: Krebs 2015, p. 118) defines it as a condition which arises from an unequal attitude towards distributing wealth among the society and its material sources, when the living standards and satisfaction of elementary needs are not secured to a necessary level by sufficient resources, and when for some objective reasons these resources cannot be increased and when the citizen does not have any other resources or property that would make it possible for them to acquire the amount of money that is considered as the minimum by the society. To live in poverty thus according to Žižková (2015, p. 118) means to live without what is considered necessary by society. Consequently, the sense of material deprivation arises.

A different view is held by Townsend who is quoted by Mareš (1999, p. 111) who defined poverty as follows: Individuals, families and groups may be considered poor as long as their resources are not big enough to secure food, participation, living standards and requirements that are common or the achievement of which is at least broadly stimulated and approved of in society to which they belong. Their income is so much below the level of income which the average individuals or families have at their disposal that they are de facto excluded from the living standards, habitual practices and activities typical for this society.

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3.1   Subjective and objective division of poverty

The subjective concept of poverty is related to the fact how everyone assesses their situation, whether the involved person or household feel to be threatened by poverty or not. It is thus related to the individual perception of poverty and depends on various factors. Oftentimes, the sense of poverty is based on a comparison of what the person or household possess compared to what they would want to possess, or what they think they deserve, or else what they really need or what others have. Plenty of people may perceive themselves as poor, even though in reality they are not (for example, one might perceive themselves poor as they cannot afford a car and must commute by public transport).

By contrast, a poor person may not perceive themselves poor, even if they are (e.g. an immigrant on a low income living in a foreign country). As it follows from the above mentioned, subjective poverty cannot define the official boundaries of poverty, yet it illustrates the issue of poverty from a deeper point of view. It follows logically that subjective poverty reveals a larger occurrence of poverty than the objective poverty (Krebs 2015). Mareš (1999) states that according to the researches, the individual perception of the situation changes during the course of life. Until midlife people rarely tend to be threatened by poverty, yet approximately from the age of fifty and above this sense increases.

3.2   Absolute and relative division of poverty

An absolute concept is one part of the objective poverty. It is related to the income that is necessary for a person to cover the costs essential for the pure survival. Such income is called a substitute minimum (African people or Somalian people, in particular, might be a classic example of people who are still threatened by the death of hunger). Such poverty is important particularly in the developing countries where it is still rather topical, while in the developed countries it is usually not a case anymore. Mareš (1999) believes that the extent of this type of poverty does not change with the transformation of the living standard of the society. According to Walsh, Stephens and Moor (2000), absolute poverty includes proportional aspects. He takes the example of households that are without electricity representing the condition of absolute poverty in contrast with households with electricity.

A relative concept is the second part of the objective poverty. It is based on the fact that the individual is able to satisfy their basic needs that are common for the given society, yet they feel miserable as they cannot secure such needs that represent the standard for the society (e.g. nowadays, it is very common to own a notebook or personal computer and the individual who does not have one might be depressed by this fact). Such type of poverty gets manifested by a shortage of an object of a long-term character, insufficient living comfort or income that excludes the possibility to save money. Mareš (1999) emphasises that in individual countries poverty is measured in relation to the living standard in these countries. Relative poverty is based on the comparison of this living standard between poor and "not poor" people. According to Walsh, Stephens and Moor (2000), relative poverty is related to the objects that are important for the inner peace of the individual. As an example, he mentions clothes shopping that creates such contentment. The people who are forced to buy clothes in the so-called „second-hand shop", which is a shop with used clothes, are relatively poor towards those who can afford new clothes.

3.3   Poverty from the perspective of gender inequality

Statistics from 2014-2016 show that the poverty in Europe, respectively in the Czech Republic, is strongly feminized. This issue is covered in a newly published study called Gender and energy, which was elaborated by the Institute of Sociology in collaboration with German Heinrich-Böll-Stiftung foundation in 2016. As Marková Volejníčková et al. (2016, p. 45) state the term feminization of

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poverty denotes a worldwide trend in the increase and predominance of poverty among women population compared to the men population. As the authors state in their study (2016), in 2014 more women than men were threatened by poverty in Europe. Poverty was an issue with more than 65 million women and 57 million men. In the Czech Republic in the same year, 13.3% of men and 16.3% of women were affected by poverty. The causes of poverty among men and women are usually different. Women find themselves more often in this situation after they have split up with their partner and stay alone with children. Women more affected by poverty fall into under these groups: older women, single mothers, single women, lesbians, bisexual and transgender women, disabled women and women from ethnic minorities. In the Czech Republic, retired women are threatened by poverty. It is due to the difference between men and women in their social security in their old age caused by the income difference between men and women during their life. Also, another factor is unpaid work and care for children that is more often secured by women. In the population of 65 years and above, the risk of poverty rate with women is twice as bigger (13.6%) than with men (6.9%).

4   Research in the microregion of Karviná

In the second part of the contribution, the research in the microregion of Karviná will be presented. The aim of the research is the perception and classification of the living standard of the population of the microregion of Karviná along with their attitudes towards the social demographic groups that are endangered by poverty and social exclusion. The microregion of Karviná was chosen for the research for its economic and demographic changes that the region has been facing for several years. The first part will be devoted to the socio-demographic characteristics, the following part will present us with the results of the field research.

4.1   Socio-demographic characteristics of the microregion

The characteristics of the microregion of Karviná is related to its location, economic and demographic structure. High unemployment together with the ageing of the population present a big issue. Within the District of Karviná, Karviná is the second most populated city, the first one being Havířov with its 72 382 people in 2017. In Karviná, there were 53 522 people on December 31, 2017, according to the Czech Statistical Office, out of which 26 387 were men and 27 135 were women. A detailed description of the social situation in Karviná city is stated in the census from 2011. According to the census, 56 897 people lived in Karviná city in the given year, the majority of which (almost 39 000 people, 68.5%) were among the group aged between 15 and 64 years. Regarding the family status, married people outnumbered the unmarried (22 675, respectively 22 026). As far as the economic activity is concerned, there were 21 046 employed people. Out of which the majority was employed in the industry (6 788 people, 32.2%). Regarding the education, people with secondary education without the final exam certificate represented the most numerous group, including the apprentice people (18 340, 32.2%).

   Population decrease was a typical specificity in Karviná city at the time of the census. Such a tendency in the demographic development is also typical for the entire Moravian-Silesian Region. According to the publication of the Regional branch of Czech Statistical Office (2016), a regular year-on-year decrease in the number of people since the mid-1990s can be noticed, with the only exception in 2007 and 2008. Between 2010 and 2015, the strongest population decrease was noticed in the Karviná district – due to the migration as well as due to the natural population decrease.

   The population of the Karviná district are of the highest average age within the regions, reaching 42.5 years in 2015 (a Regional branch of Czech Statistical Office, 2016). Population decrease in Karviná is also confirmed by the data from 2017 when 495 children were born in the city, yet 692 people died. The migration gain is also of a negative value amounting to 694 people (see Table 1 for more details).

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Table 1. Population mobility on December 31, 2017

Indicator	Number
Children born alive	495
Dead	692
Immigrants	756
Emigrants	1 450
Increase (decrease)	
Natural	-197
Migration	-694
Total	-891

Source: Czech Statistical Office

Population decrease in Karviná is significant predominantly in the long-term comparison. According to the demographic data on municipalities in the Czech Republic, there were 76 075 people living in Karviná city at the beginning of the 1970s and its number was rising in the following years. It reached its peak in 1978 when the population number increased to 81 693. Since the 1970s, the population started to decrease gradually. The main causes of the population decrease were the decline in the housing stock development supported by the state, which was shifted to the nearby cities (specifically to Havířov and Orlová). In the 1990s, the number decreased to less than 70 000. In the following years, the number was constantly decreasing until the second decade of the 21st century, when there were less than 60 000 people in Karviná. The tendency in the population decline is caused by a range of factors. According to Poledník (2014), the demographic development is influenced mainly by migration heading to further settlements and neighbouring municipalities. More distinctive migration from the cities is predominantly caused by the impacts of economic transformation on the local labour market. Also, the impact of negative social phenomena and their perception play an important role.

4.2   Analysis of the results of the research

The research was conducted in 2017 from January to March. The quantitative type of research was chosen, applying the method of interviewing by means of a questionnaire. The method of the research was chosen in such a way so that it addresses a wide spectrum of citizens. The anonymous questionnaire enables the respondents to express their feelings, attitudes and opinions in the so-called open questions. At the same time, the regulated, in advance ready-made closed questions are also important for the research when the respondents choose one of the offered answers. The questionnaire offered also an option of scaling (the answer expressed by numbers from 1 – the best to 5 – the worst). The questions in the questionnaire were formulated in such a way that they are easy and accurate. 600 questionnaires were distributed, out of which 580 questionnaires were filled in correctly and were used.

The respondents were divided into five demographic groups: student, the unemployed person, the retired person, the employed person and self-employed people. The aim of this division was to process and compare the opinions of young students with people fully employed being in their midlife and later life, and retired people that hypothetically presented a group that is threatened by poverty and social exclusion, similarly as the group of unemployed people. As a contrast, the group of self-employed people represented a group of hypothetically wealthy people. All demographic groups were represented in the research proportionally by the same number. The distribution was conducted within the city of Karviná and its adjacent municipalities. And, in part of the Havířov city and Orlová city.

Out of the entire number of respondents, 57% were women and 43% were men. The age range of the respondents was: up to 25 years – 22%, between 26 and 45 years – 34%, between 45 and 65 years – 26% and over 66 years – 18%. The proportional representation of the respondents concerning their

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sex and age was important for the research in order to maintain the plurality of opinions on poverty and relation toward groups of people that are most threatened by poverty.

After that, the respondents were divided according to their income. Less than one-half of the addressed students – 47% belong to the income group below 5 000 CZK per month. Also, 69% of unemployed respondents belong to this income group. One-half of the retired respondents – 53% earn between 10 and 15 thousand CZK per month. The majority of employed people oscillate between 15 and 25 thousand CZK per month. More than half of the self-employed people – 56% have an income higher than 30 thousand per month (see Figure 1).
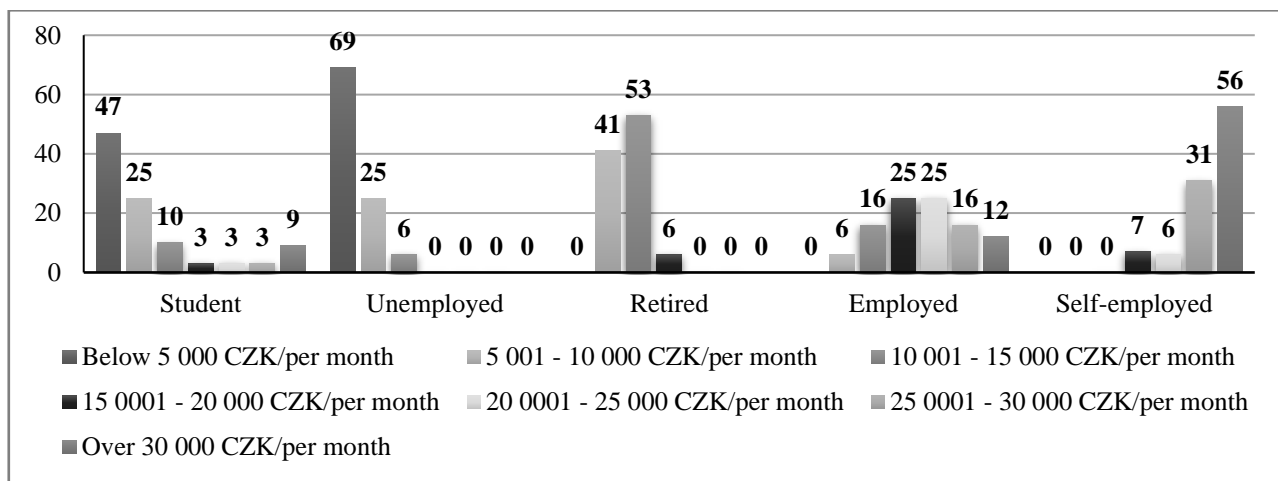
Fig. 1. The income groups of the respondents (in %) (Source: own processing)

In the questionnaire, the respondents expressed their opinions on the tools of the social policy in the Czech Republic that should prevent the poverty. They are minimum wage, living and existential minimum.

The minimum wage is the minimum pay that people are entitled to by law from their employer. It is legally stipulated by the Labour Code (Act No. 262/2006 Coll., as amended). A minimum wage that was authorised in 2018 is 12 200 CZK (Tröster and Koldinská et al., 2018). As is shown in Figure 2, all groups of respondents, except the self-employed, are in favour of the increase of the minimum wage. The self-employed people would leave the level of minimum wage unchanged – 34%, 35% would increase the minimum wage. An interesting fact is that 22% of the self-employed respondents never take interest in the level of the minimum wage. It might be due to the fact that the majority of self-employed respondents do business in services where there is a problem with financing, either from the state or from the clients.
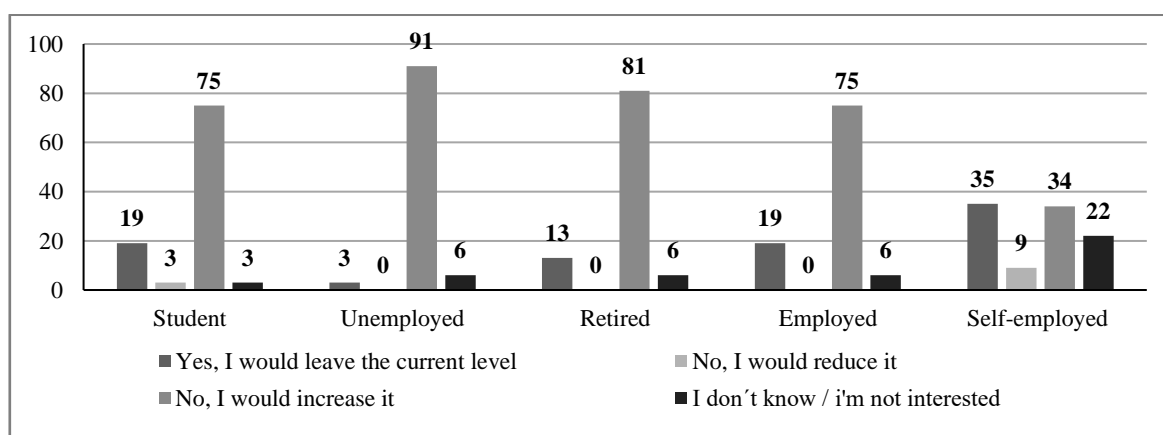
Fig. 2. The respondents´ opinions on the minimum wage (in %) (Source: own processing)

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The following Figure 3 represent the results of the respondents´ opinions on the existential minimum. The living and existential minimum are important terms, defining such an amount of income that is from the perspective of our society acceptable to secure our food and other personal needs – living minimum, or that is necessary for the mere survival – existential minimum (Turečková and Buryová, 2017).

Except for the self-employed respondents, other respondents are in favour of the increase of the existential minimum from more than two-thirds. 35% of the respondents perceive it as adequate, 31% - would be for the increase, and 25% do not take interest in the living minimum.

Fig. 3. Respondents´ opinions on the existence minimum (in %) (Source: own processing)

The respondents´ opinions on the level of living minimum were similar. More than two-thirds of the respondents were in favour of its increase.

In the next questionnaire, the respondents commented on the fact whether they feel themselves to be the richest, rich, rather rich, rather poor, and poor or the poorest. These were closed questions when the respondents choose only one option. This was one of the key questions as it was closely related to the aim of the research.

Most of the students – 50% regard themselves as the better middle part of the poverty range, i.e. rather rich. 2% of the respondents regard themselves as rather poor, 6% of the addressed students regard themselves as the richest.

On the contrary, the majority of the unemployed – 56% rated themselves as the poorest and 19% regard themselves as poor, which might have been assumed. An interesting fact is that 16% of the unemployed regard themselves as the richest. Here we can assume a certain level of subjectivity of material existence resulting in material poverty, which is probably not an issue with 16% of the unemployed people. In other words, they do not have money, yet they are materially secured and do not live in need. It might be so that they are part of a wealthy family or they are not demanding as far as their living standard is concerned.

Almost half of the addressed retired people (47%) and most of the employed people (69%) regard themselves as the better middle part, i.e. rather rich. With the retired people, this figure is rather surprising. We hypothetically assumed that the retired people would regard themselves as poor or rather poor. After counting the percentage representing the number of people who regard themselves at the boundary of poverty, it is approximately half of the addressed retired people (53%).

Half of the self-employed respondents – 50% rank themselves as rich and 28% rather rich, which we had assumed in the research. 19% of the respondents regard themselves as rather poor and 3% regard themselves as poor.

Neither the self-employed nor the employed people regarded themselves as the richest, even though both groups belong among the highest income groups within the questionnaire.

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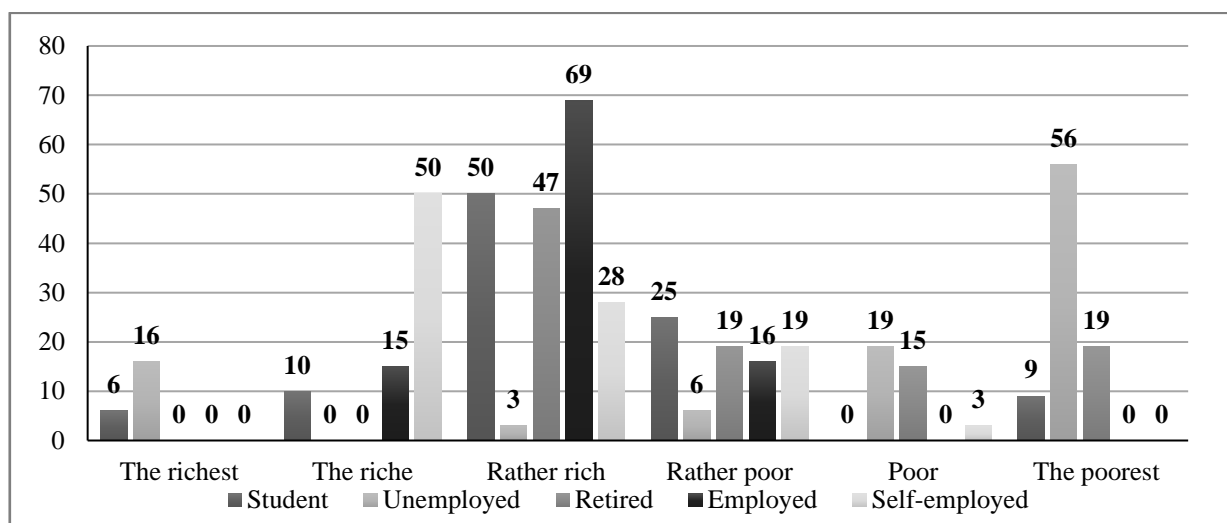
Fig. 4. Own evaluation of the respondents on the scale of poverty (in %) (Source: own processing)

In the last part of the questionnaire, the respondents expressed their opinions on groups of people in the Czech Republic (unemployed, disabled people, single mothers, prison leavers, young people leaving children care homes, senior citizens, homeless people, foreigners and refugees) that are threatened by poverty. They had to choose from one of the options and mark its importance using the scale: 1 – rarely threatened by poverty, 5 – highly threatened by poverty.

If the respondent left an empty space with the given group of people threatened by poverty, it implied that they do not think the given group is threatened by poverty.

The addressed students (60%) state homeless people as the most threatened group of people. 31% of the respondents think that the least threatened by poverty are foreigners and refugees. An interesting result is with the addressed students related to the group of people moderately threatened by poverty. Its percentage is higher than with other groups of respondents.

According to 50% of addressed students, single mothers, in particular, are moderately threatened by poverty, 38% of students regard prison leavers as moderately threatened, too.

According to 50% of addressed unemployed people, the homeless people are most threatened by poverty. According to 47% of the unemployed, foreigners and refugees are least threatened by poverty. According to 53% of the unemployed people, retired people are not threatened by poverty at all.

38% of the retired people think that homeless people and single mothers are most threatened by poverty. Further on, 38% of the respondents regard the disabled people as the threatened group. The addressed retired people show a negative attitude towards the unemployed, prison leavers, refugees and foreigners.

The respondents within the group of employed people regard homeless people as the most threatened group by poverty, specifically 66% of the employed. According to the employed people (19%), foreigners and refugees are least threatened by poverty. 44% of the employed think that single mothers are threatened by poverty, 37% regard disabled people as the threatened group. As with the previous groups of respondents, they have a negative attitude towards prison leavers, foreigners and refugees.

The self-employed respondents regard single mothers as most threatened by poverty – 84%. Nearly one half of them regard the retired people as the threatened group. More than half of the self-employed respondents regard the disabled people as threatened by poverty. They show a negative attitude towards homeless people – 53%, the unemployed – 47%, and prison leavers.

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5   Conclusion

The aim of the contribution was the issue of contemporary poverty and its perception by the public. In the theoretical part, the theoretical opinions of the authors of professional publications were chosen defining the terms of subjective, relative and absolute poverty. They agree that it is an issue related to the contemporary living standard of modern society and is determined by the level of economic advancement of the given country (Žižková, 2015; Krebs, 2015 and Tomeš 2001). Some also state (see Mareš, 1999) that the boundary between absolute and relative poverty does not change with the change of living standard of the society. According to other authors (Marková Volejníčková, 2016), the perception of poverty is related to the material equipment, access to energy and gender issues.

Several questions arise: How do people currently perceive their living standard? Is it related to their income? Or to the material equipment? Do the people who according to the experts belong to the group threatened by poverty feel to be poor or rich? How are these groups perceived by the public? The questions should have been answered by the research in the microregion of Karviná, which represents an area with rising unemployment, an issue of growing population and high migration of people.

The results of the research confirm the theoretical views in large part. At the same time, they come as a surprise. The result of 16% of the unemployed people ranking themselves among the richest, who belong to the income group of less than 5 000 CZK/per month, is food for thought. The group of self-employed people with incomes 30 000 CZK/per month and above do not regard themselves as the richest. Another surprising result was with the group of retired people when more than a half of them regard themselves as rich. Yet, these senior citizens are generally perceived as being potentially poor. At the same time, the opinion concerning the risk groups being threatened by poverty is very much subjective. The majority of the respondents regard the homeless people as the most risk group, which could have been assumed. A group of self-employed people regard single mothers and disabled people as threatened by poverty. The results of the research pointed at the negative attitude towards foreigners and refugees who, according to the respondents, are not threatened by poverty. A similar attitude is also adopted towards prison leavers.

In conclusion, it may be stated that the respondents´ opinions result from their regional affiliation and are related to the mentality of the citizens of the Karviná region. The perception of one´s own poverty or wealth is very much subjective and not much related to the term of relative poverty. The attitude towards people that are generally threatened by poverty and social exclusion is more based on one´s own experience than on the general view. The research has provided us with answers to the research questions, yet it also arouses new ones. Undoubtedly, it will be interesting to continue with the research in other regions within the Czech Republic and compare the results.

6   Acknowledgement

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FINANCIAL EDUCATION, DEBT LITERACY AND CREDIT MARKET PARTICIPATION: THE CASE OF POLAND

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Abstract
Generally, financial market participation is considered a healthy and desired consumer behaviour. However, participation requires some degree of financial literacy. It is well recognised that more financially literate individuals are more likely to participate in markets for financial assets. Yet, the link between financial literacy and credit market participation is less studied and – due to the properties of debt – seems to be a more complex issue. We examined not only this link, but also the relation between financial education – both formal and informal – and debt literacy as well as credit market participation. To do so, we processed survey responses obtained in a nationally representative sample of Poles within a series of logistic regressions. We found that actual debt literacy was insignificant in explaining credit market participation, while self-assessed debt literacy was significantly and positively associated with participation. Although both formal and informal financial education were positively linked to higher debt literacy, only informal education turned out to be a significant predictor of credit market participation.

Keywords
Credit market participation, Debt literacy, Financial education, Financial literacy.

JEL classification
D12, D14, G20

1   Introduction

The financial well-being of households is determined by their financial market participation, among other factors. In the long-term, stock market participation seems to be particularly important. Non-participation in risky asset markets – such as the stock market – is deemed as a serious investment mistake (Campbell, 2006), while the costs of non-participation in these markets can result in a significant welfare loss (Cocco et al., 2005). Hence, stock market participation is regarded as a desired consumer behaviour, despite the accompanying risk.

The causes and effects of households' credit market participation have been less well investigated and, as a result, they are less well known (Zinman, 2015). Cecchetti et al. (2011, p 1.) argue that debt 'clearly improves welfare' when used 'wisely and moderately'. This implies that credit market participation could be considered a desired consumer behaviour as well. Such view is reasonable as some households' income-yielding assets are financed by borrowings. Obviously, in both cases – stock market and credit market participation –over-reliance is undesirable, however the potential costs of such over-reliance seem to be more serious in the credit market because debt imposes additional (default) risk on the household. Therefore, in many cases, entering the credit market may be unjustified or even inadvisable because it might jeopardize the financial stability of a household. This is particularly the case since the credit market is internally diversified and consists of segments that differ in terms of risk and consumer protection.

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2　Literature review

The assessment of credit market participation of households is also more complex and ambiguous because debt – more than any other financial instrument – imposes a psychological burden on the consumer (Fitch et al., 2007; Jenkins et al., 2008; Archuleta et al., 2013). As a result, the level of household financial liabilities – contrary to the level of assets – was found to be negatively associated with overall life satisfaction, financial satisfaction, and subjective prosperity (Brown and Gray, 2016). All this may suggest that, from a household perspective, the barriers of entry to the credit market may be both larger and more diversified as compared to the stock market.

Financial market participation is one of many measures of household financial behaviour. Participation requires a certain amount of financial savvy or sophistication. Theoretically, more financially savvy individuals are more likely to participate in the financial market due to more financial knowledge and / or skills acquired by them. The knowledge and skills allow them to better realize intertemporal benefits and costs related to participation as compared to non-participation. It has long been acknowledged that both stock market participation, and the resultant long-life wealth accumulation, are, in fact, positively correlated with consumers' financial literacy (Yoong, 2011; van Rooij et al., 2011; Bucher-Koenen and Ziegelmeyer, 2011; Behrman et al., 2012; Beckman, 2013; Almenberg and Dreber, 2015; Ashok and Spataro, 2015). However, the empirical literature on the link between financial literacy and credit market participation of households is incomparably more scarce. Brown and Graf (2013) found that financial literacy is positively correlated with the incidence of mortgages in Switzerland, however they observed null effect of literacy on the incidence of consumer debt. Disney and Gathergood (2012) established that consumer credit market participation is negatively related to financial literacy in the UK. Hence, in light of the results of these rare studies, there is much scope for determining the role of households' financial sophistication for their participation in the credit market.

Theoretically, financial literacy should be gained through financial education, apart from other sources. Surprisingly, the empirical literature on the link between financial education and financial literacy is highly inconclusive. This is clearly visible in the latest narrative literature surveys and meta-analyses (Hathaway and Khatiwada, 2008; Collins and O'Rourke, 2010; Hastings et al., 2013; Fernandes et al., 2014; Miller et al., 2015; Kaiser and Menkhoff, 2016). Hastings et al. (2013) state that the evidence that financial education increases financial literacy 'is more limited and not as encouraging as one might expect' (p. 359). On the other hand, Kaiser and Menkhoff (2016) conclude that financial education impacts financial behaviour and, to an even larger extent, financial literacy. However, in these different extensive, large-scale studies, different relationships are emphasized. Apart from the link between financial education and financial literacy, many studies assume that, for practical reasons, researchers 'are more interested in financial outcomes than financial knowledge per se' (Hastings et al., 2013, p. 359) and, hence, they concentrate on the link between financial education and financial behaviour (and, ultimately, financial outcomes; see Miller et al., 2015, for instance). Other researchers focus on the effect of financial literacy on financial behaviour (and resultant outcomes; see Allgood and Walstad, 2016, for instance). In fact, each of these relationships – (i) between financial education and financial literacy, (ii) between financial literacy and financial behaviour, and (iii) between financial education and financial behaviour – contributes differently to the discussion on the effectiveness of educational interventions regarding household finance, and each deserves a separate treatment.

Moreover, one of the most interesting questions in this vein is whether financial education influences financial behaviour indirectly (i.e. through financial literacy), or directly (i.e. bypassing financial literacy). Amromin et al. (2009) state that 'No study definitely demonstrates that a financial education programme improved participant outcomes *through* financial literacy' (p. 13). Perhaps financial education induces some financial behaviours (e.g. greater market participation) through channels other than financial literacy. For instance, financial education might shape financial behaviour through financial self-confidence which detaches from actual financial literacy. Willis

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(2008) posits that financial education can boost financial self-confidence without accompanying increase in objectively measured financial literacy. The question whether healthy financial behaviour requires a goldilocks approach, namely a 'well-calibrated degree of confidence – neither underconfidence nor overconfidence' (Willis, 2008, p. 203), is still open. Parker et al. (2012) argue that confidence in financial knowledge may prompt desired financial behaviour regardless of the degree to which it deviates from actual knowledge. Some empirical tests confirmed that objective financial literacy and subjective perception of the literacy are weakly related or not related at all (Agnew and Szykman, 2005).

Finally, previous studies paid little attention to the role of informal financial education in shaping financial literacy and downstream financial behaviour. The findings of behavioural researchers show, however, that social interactions can be critical in explaining household decision-making in the personal finance realm. Duflo and Saez (2003) showed that social networks can drive consumers' financial decisions in two ways: through peer effect and through conformity effect. The peer effect refers to the concept of informational cascade, i.e. the tendency of individuals to act based on information on other individuals' actions. Hence, consumers can simply learn from others while conversing with them (word-of-mouth learning) – particularly when they have a shared interest – or acquire knowledge by inferring from the experience of other consumers, such as family members, friends, acquaintances, co-workers, neighbours, etc. (observational learning). The conformity effect results from the need of consumers to accommodate to the social group to which they belong through mimicking selection patterns observed in this group. These effects were confirmed by Duflo and Saez (2003) in a study of retirement plan decisions, and later by Hong et al. (2004) who showed that socialized consumers – those attending church or interacting with neighbours – were more likely to participate in the stock market compared to non-socialized households. Also Cole and Shastry (2009) corroborated the peer effect in the study showing how learning from employers and neighbours can affect financial market participation.

Given that it is much more difficult to consider credit market participation unambiguously healthy financial behaviour – compared to participation in financial asset markets – we decided to investigate the links among financial education (both formal and informal), financial literacy (objective and subjective) and the observed formal debt holding. To achieve this goal, we used a new instrument measuring the debt literacy of consumers (instead of more general financial literacy) and a novel dataset collected in a representative sample of adults.

3   Method

In our study we have started from a theoretical model consistent with the framework established by Huston (2010).

3.1   Analytical model and hypotheses

Our analytical model is presented in Figure 1. Firstly, like Huston (2010), we have clearly separated financial literacy from financial education in the model given that '*financial education* is a process through which financial knowledge and skills are gained, rather than the knowledge and skills themselves' (Hung et al., 2009, p. 8). However, we augmented the model of Huston with a separation of financial education (FE) into formal (FFE) and informal (IFE). As mentioned in the Background section, we replaced the general construct of financial literacy with a more specific concept of debt literacy, defined as the degree to which one knows key debt-related concepts and possesses the ability and confidence to manage household debt. However, we have also distinguished subjective debt literacy (SDL), diagnosed as respondents' self-assessments, from objective debt literacy (ODL), which was measured through a test. We have assumed that, *ceteris paribus*, FE (both, FFE and IFE) increases ODL. Further, we have supposed that – for the reasons discussed earlier in the Background section – there is no clear-cut relationship between ODL and credit market participation (CMP,

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henceforth), especially because reverse causality can be involved in the relation, namely those who participate in the credit market learn from experience so they may exhibit higher ODL as a result.

Further, we have assumed that the uptake of a financial education – irrespective of formal or informal – can produce only a feeling of being more financially sophisticated without actual improvement of knowledge and skills, as postulated by Willis (2008). In other words, we have assumed that, *ceteris paribus*, more financial education promotes financial self-confidence: the education translates into higher SDL. Then, following Parker et al. (2012, p. 7), who argue that financial confidence may facilitate taking actions through 'reducing hesitation and increasing risk taking', we have assumed that there is a positive link between SDL and CMP.
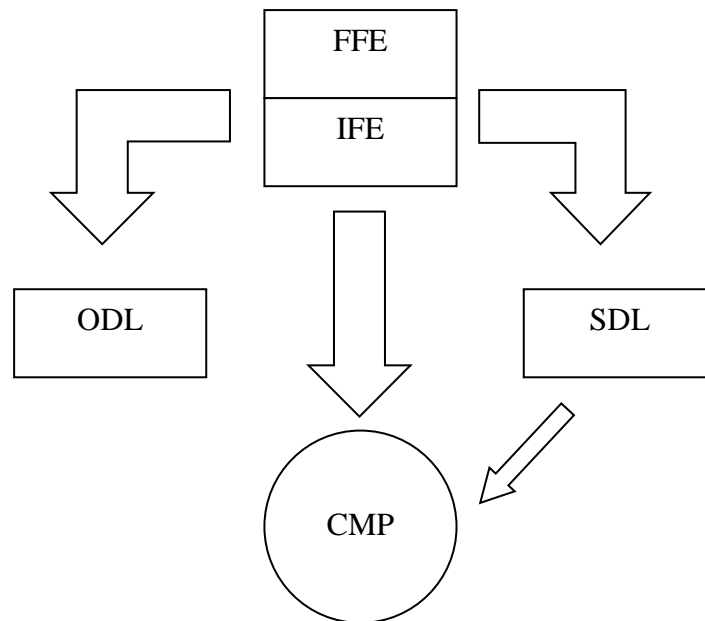
Fig. 1. Analytical model employed in the empirical investigation (Source: Authors)

Finally, our model differs from the conceptual framework of Huston (2010) in that it allows for direct influence of FE on CMP, excluding financial literacy as a medium (or intermediation link). Nevertheless, following Huston (2010), we allowed for additional other factors (e.g. human capital, cognitive abilities, behavioural biases, cultural factors, economic status, etc.) to influence both FL and CMP, apart from FE. Hence, even though we have hypothesized a direct link between FE and CMP in our model, the link can be intermediated in reality by a factor other than SDL. Additionally, we allowed for a reversed causality between debt literacy and CMP, although we did not study it and we did not include it in Figure 1 (see Stolper and Walter, 2017 for a review of studies on the causality). In other words, we cannot rule out the possibility that individuals acquire debt literacy (including SDL) through experience (i.e. through CMP). To recap, our analytical model supposes two routes leading from FE to CMP: one indirect route leading through SDL and one direct route.

Based on the existing literature reviewed in the Background section and on the links demonstrated in Figure 1, we formulated the following hypotheses:

H1: More financially educated individuals display higher ODL.
H2: More financially educated individuals display higher SDL.
H3: There is no specific pattern in the relationship between ODL and CMP.
H4: Individuals displaying higher SDL are more likely to participate in the credit market.
H5: More financially educated individuals are more likely to participate in the credit market.
Hypotheses H1, H2, and H5 were tested separately for FFE and IFE.

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3.2   Data and participants

We fielded the questionnaire-based survey during the period 16 June 2015 to 3 July 2015. The data was collected through Computer-Assisted Telephone Interviewing (CATI) – both landlines and cell phones – with a representative sample of 1,004 adult Poles. The survey was administered by BioStat – a renowned research company operating in Poland. The sample was controlled by cross-section quotas for three demographic variables: sex, age, and region (voivodeship, a Polish administrative region). The sample was not controlled for urban or rural place of residence, so – as an effect of random sampling – respondents from urban areas were slightly over-represented in the sample. Our questionnaire consisted of 39 questions and was divided into three general sections: (1) 22 closed and semi-open questions through which the respondents self-reported a wide range of behaviours and attitudes related to the credit market, (2) the debt literacy test containing 12 'true / false / don't know' queries (DK, hereafter), and (3) respondents' characteristics (five questions related to sociodemographic and economic traits). This article presents a study which used only selected data collected during the survey. The survey instrument is available upon request from the authors.

3.3   Measures

Credit market participation (CMP) was generated as a binary indicator equal to 1 should respondents indicate at least one institution in response to the following question: 'Have you ever taken out credit from one of the following institutions?', 0 otherwise. The list of institutions comprised not only obvious lending entities such as commercial banks or credit unions, but also personal loan companies (both online and offline) and social lending platforms, among others.

We measured actual debt literacy (ODL) with our authorial instrument which was a twelve-question 'true / false / DK' choice test (see Appendix), as mentioned before. Correct answers were coded as 1 while all remaining options (incorrect answers as well as DK responses) were coded as 0. Hence, the objective debt literacy index ranged between 0 and 12 in value. An extensive discussion on both the properties of our instrument and its validation can be found in Cwynar et al. (forthcoming).

Respondents' self-assessments of debt literacy (SDL), used as a proxy for confidence in debt-related knowledge, were measured with a 5-point Likert scale. SDL came from the survey item that asked: 'On a scale of 1 to 5, where 1 means very low and 5 means very high, how would you assess your debt knowledge?' This question preceded the objective diagnosis of debt literacy based on the aforementioned twelve-question test.

Formal financial education (FFE) was generated as a binary indicator equal to 1 should respondents provide a positive response to the following question: 'Do you have any formal financial education or have you ever attended any specialized course in finance?', 0 otherwise. Informal financial education was estimated as a binary variable in the following way: =1 if respondents indicate at least one source of debt-related knowledge in response to the following question: 'Which of the following sources do you use to educate yourself in the debt-related field?'; =0 otherwise.

Trust in lending entities (TRUST) was generated as a binary indicator equal to 1 should respondents provide a positive response to the following question: 'Do you trust the institutions that extend credit to private individuals?', 0 otherwise.

Attitude to credit (ATTIT) was measured through respondents' self-assessments on a 5-point Likert scale (where 1 meant 'Decidedly negative' and 5 meant 'Decidedly positive) when answering the following question: 'What is your attitude to credit in general?'

Finally, we used standard sociodemographic and economic features in our regressions: sex (GENDER), place of residence (RESID), age (AGE), and educational attainment (EDUCAT).

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3.4   Analytical strategy and models

We split the entire analytical process into three parts: (i) descriptive analysis, (ii) bivariate analysis, and (iii) regression analysis. In bivariate and regression analyses we focused on the links among financial education (both FFE and IFE), debt literacy (ODL and SDL) and CMP. Bivariate analysis was used given that some of our key variables were coded as binary vectors, and we had the opportunity to study the statistical significance of the difference between means of key variables estimated for distinguished subsamples (formally educated vs. non-educated; informally educated vs. non-educated; credit market participants vs. non-participants). To do this, we applied chi-squared, Cramér's V and U Mann-Whitney tests. The selection of the tests was preceded by standard analysis of these tests' applicability to the properties of the examined data sets (Szwed, 2008).

The correlation analysis was followed by the application of regression models. We ran a series of logistic regressions to scrutinize the ties among studied variables and to test our hypotheses. Specifically, by removing debt literacy measures from some models and leaving only financial education measures in these models (apart from control variables) – and vice versa – we were striving to learn whether debt literacy measures have comparable or incremental power in explaining CMP when compared to the power of financial education measures.

In the first step, we used two measures of debt literacy – namely, ODL and SDL – as the dependent variables and we examined the link between financial education and debt literacy. In fact, four relations were studied in this step (FFE vs. ODL; FFE vs. SDL; IFE vs. ODL; IFE vs. SDL). We started the analyses by checking the strength and direction of the association between our dependent variables (ODL and SDL) and: (i) two measures of financial education used as diagnostic variables (FFE and IFE), and (ii) other potential independent variables used as controls. Then, we investigated whether debt literacy (both ODL and SDL) and financial education (both FFE and IFE) are related to credit market participation treated as the dependent variable. Again, we first checked the strengths and vectors of the links between CMP and the diagnostic variables (ODL, SDL, FFE, IFE), as well as control variables (both suggested by the existing literature on financial literacy and newly introduced by us).

4   Results

In this section we present the main results of our research, including descriptive analysis, bivariate analysis and regression analysis.

4.1   Descriptive analysis

Table 1 reports basic statistics for the full sample. Credit market participants accounted for 67% of the total sample. On the one hand, 13% of respondents scored '0' in our debt literacy test meaning that they responded correctly to none of the test questions. On the other hand, no respondent answered all the test questions correctly. A mere 4% of the total sample achieved a test score higher than 6 on a scale from 0 to 12. ODL mean reached 2.62, at median amounting to 2.59%. 59% of respondents assessed their own debt literacy as moderate (SDL=3). 9% self-reported that their debt literacy was decidedly low while 5% self-reported that the literacy was decidedly high. SDL mean achieved 2.83, at median amounting to 3.

Barely 13% of all respondents reported that they had received a formal financial education or participated in specialized financial courses. The sample was quite evenly split into those individuals who confirmed that they used at least one source of informal financial education (51%) and those who reported that they were not educating themselves financially in any informal way (49%).

In terms of standard sociodemographic features, our sample was dominated by individuals aged above 50 years (41%), with a slight prevalence of female respondents (52%). More respondents reported town or city than village as their place of residence (69% versus 31%). The largest income classes were individuals making PLN 500-999 (20%) and PLN 1000-1499 (18%).

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Table 1. Tested variables – basic statistics

Variable	Min value	Max value	Arithmetic mean	Median	Standard deviation	Variability index (%)	Dependence with CMP ($\chi 2$ test)
CMP	0	1	0.67	1	0.469	70	-
ODL	0	11	2.62	2	1.915	73	0.191
SDL	1	5	2.83	3	0.899	32	0.001
FFE	0	1	0.13	0	0.331	264	0.865
IFE	0	1	0.51	1	0.500	98	0.001
TRUST	0	1	0.33	0	0.470	143	0.001
ATTIT	1	5	2.80	3	1.079	39	0.001
GENDER	0	1	0.48	0	0.500	105	0.458
AGE	1	4	2.74	3	1.210	44	0.002
EDUCAT	1	3	2.17	2	0.762	35	0.855
RESID	1	5	2.69	2	1.524	57	0.733
INCOME	1	7	3.73	3	1.823	49	0.370

Source: Authors.

4.2 Bivariate analysis

Tables from 2 to 4 contain the results of non-parametric tests used to gauge differences in the levels of key variables among our survey participants. They show that those respondents who reported having formal financial education differ significantly from the rest of the sample in terms of ODL and SDL levels (Table 2). On the other hand, there is no significant difference between these two subgroups in terms of CMP.

Table 2. Objective debt literacy, subjective debt literacy and credit market participation: the differences between formally financially educated and non-educated respondents

	ALL	FFE=1	FFE=0	Test of difference between formally educated and non-educated
ODL (mean)	2.62	3.63	2.47	U = 37427.5 (p = 0.000)
SDL (mean)	2.83	3.37	2.76	U = 36965.5 (p = 0.000)
CMP (%)	67.3	66.7	67.4	$\chi 2$ = 0.029 (p = 0.865)
Observations	1004	126	878	

Source: Authors.

Table 3 shows that respondents who educate themselves informally regarding debt-related issues differ significantly from those who do not in terms of ODL, SDL and CMP.

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Table 3. Objective debt literacy, subjective debt literacy and credit market participation: the differences between informally financially educated and non-educated respondents

	ALL	IFE=1	IFE=0	Test of difference between informally educated and non-educated
ODL (mean)	2.62	2.90	2.33	U = 103061 (p = 0.000)
SDL (mean)	2.83	3.02	2.64	U = 97148 (p = 0.000)
CMP (%)	67.3	75.0	59.3	χ2 = 28.407, V = 0.168 (p = 0.000)
Observations	1004	513	491	

Source: Authors.

Finally, Table 4 reveals that respondents who participate in the credit market differ significantly from those not participating in the market in terms of SDL, but not in terms of ODL.

Table 4. Objective debt literacy, subjective debt literacy and financial education: the differences between credit market participants and non-participants

	ALL	CMP=1	CMP=0	Test of difference between credit market participants and non-participants
ODL (mean)	2.62	2.66	2.53	U = 105539.5 (p = 0.210)
SDL (mean)	2.83	2.93	2.64	U = 91052.5 (p = 0.000)
FFE (%)	12.5	12.4	12.8	χ2 = 0.029 (p = 0.865)
IFE (%)	51.1	57.0	39.0	χ2 = 28.407, V = 0.168 (p = 0.000)

Source: Authors.

4.3 Regression analysis

Using ordered logistic regressions (Model 1 and Model 2), we confirmed that both FFE and IFE are significantly and positively linked to each of the debt literacy measures adopted in our study – ODL and SDL (Table 5). This supports our H1 and H2. Interestingly, Model 1 and Model 2 show that FFE is related to ODL more strongly than IFE, and vice versa – IFE is related to SDL more strongly than FFE (although the difference between the strengths is marginal in Model 2).

Table 5. Results of ordered logistic regressions with ODL and SDL as the dependent variables

	Model 1 (with ODL as the dependent variable)	Model 2 (with SDL as the dependent variable)
	Coefficient	Coefficient
Independent variable:		
FFE	1.007***	1.363***
IFE	0.546***	0.888***

* $p < 0.1$; ** $p < 0.05$; ***$p < 0.01$

Source: Authors.

In all tested models, ODL turned out to be insignificant as a variable explaining CMP, whereas SDL showed a strong and positive relationship with CMP (Table 6; we demonstrate only the final models with statistically significant variables). According to odds ratio estimated in Model 3, an

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increase in SDL of 1 (on a scale from 1 to 5) raises the probability of credit market participation by more than 27%. In Model 4, the odds ratio is even higher (1.344). Hence, our results support both H3 and H4.

As with ODL, FFE was insignificant in all estimated models with CMP as the dependent variable. However, we found that IFE was significantly and positively linked to CMP. For instance, Model 3 reveals that in terms of odds ratio, those respondents who educated themselves informally in some way, had more than a 70% higher chance of credit market participation than those who reported a lack of informal financial education in their lives. The chances were even higher in Model 5 (86%). This means that our H5 gained only partial support, namely it can be accepted only if informal financial education is considered.

Table 6. Results of logit models with CMP as the dependent variable

	Model 3			Model 4			Model 5		
Independent variable:	Coefficient	Odds ratio	Marginal effect	Coefficient	Odds ratio	Marginal effect	Coefficient	Odds ratio	Marginal effect
IFE	0.542***	1.72	0.115				0.620***	1.86	0.132
SDL	0.242***	1.273	0.051	0.296***	1.344	0.063			
TRUST	0.546***	1.726	0.116	0.577***	1.78	0.123	0.568***	1.766	0.121
ATTIT	0.340***	1.406	0.072	0.362***	1.437	0.077	0.352***	1.422	0.075
AGE	0.158***	1.171	0.033	0.142**	1.153	0.03	0.154***	1.166	0.033
const	-1.726***			-1.643***			-1.116***		

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Source: Authors.

Model 4 (with SDL and without IFE as independent variables) has almost the same overall fit, as measured by the correct classification coefficient (62.15%), as Model 5 (with IFE and without SDL as independent variables), namely 62.85%. Moreover, Model 5 (with IFE and without SDL) has comparable goodness of fit as the model with both these variables (IFE and SDL), which suggests that IFE and SDL convey generally the same information content.

Our investigation revealed also that CMP is strongly and positively dependent on TRUST and ATTIT. In fact, the model with ATTIT as the sole independent variable had the highest overall fit among all tested models (63.05%). According to the odds ratio estimated in Model 4, the increase in the value of ATTIT by 1 (on a scale from 1 to 5) raises the likelihood to participate in the credit market by almost 44%. Similarly, in Model 4, respondents who reported trust in lending entities, had a 78% higher chance of credit market participation compared to those who reported a lack of trust. Finally, each shift to an older age cohort (we distinguished four age cohorts in our study) entails an increase in the chance of credit market participation by 15-17%, depending on the model. Figure 2 illustrates the probabilities of credit market participation (=1) or non-participation (=0) depending on different values of IFE (0 or 1), SDL (from 1 to 5) and other significant independent variables (ATTIT, TRUST and AGE).

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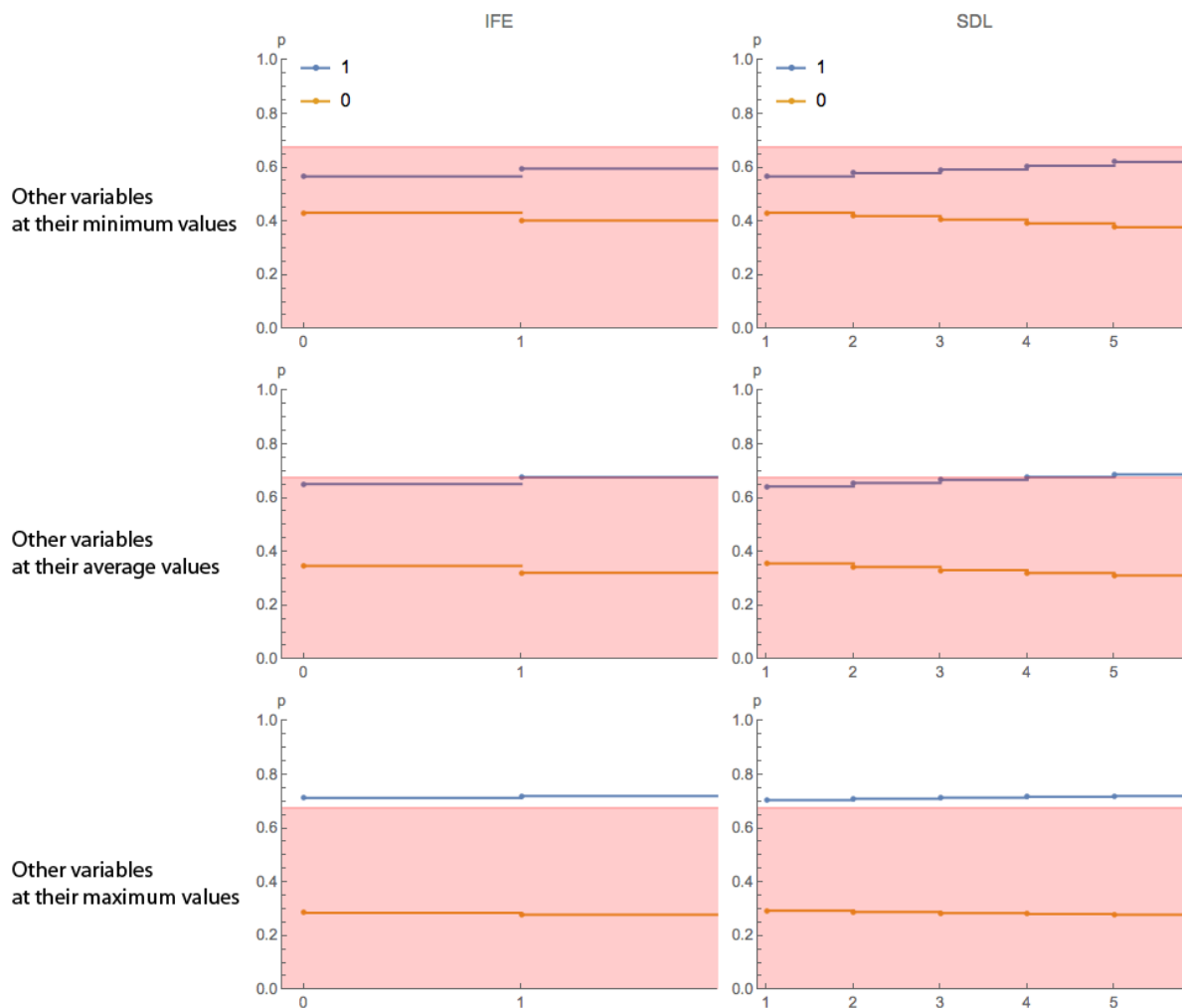
Fig. 2. Probability of credit market participation (=1) or non-participation (=0) depending on different values of IFE (0 or 1), SDL (from 1 to 5) and other significant independent variables (Source: Authors)

5   Discussion and conclusions

Much of the evidence brought by our study confirmed the expectations reflected in the hypotheses. This pertains, among others, to the link between financial education and debt literacy. As expected, those respondents who received formal financial education were significantly more likely to score high in our debt literacy test, but they were also more financially self-confident. The method we applied does not allow to infer about the direction of causality, but nevertheless this result confirms the efficacy of education in enhancing financial literacy. It could hardly be supposed that the reverse causality between formal financial education and financial literacy applies (namely, that a rise in financial literacy induces the decision to take up formal financial education).

Interestingly, we also found significant and positive relations between informal financial education and debt literacy. This means that consumers may become more financially savvy not only due to professional learning programmes which are costly in terms of both money and time. Our results suggest that financial sophistication can be increased through the support provided by individuals forming social networks of consumers and / or through the usage of such cheap cost-free information sources as various types of media. Hence, efforts aimed at promoting the financial literacy of consumers through actions carried out on TV, radio or the Internet seem to be warranted in light of our findings. Nevertheless, it is essential to note that other education interventions may be more cost-effective – this issue is not covered by our study.

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The insignificance of ODL in explaining CMP in our research is an intriguing, however, understandable, result. In what follows, we discuss some possible explanations of such an outcome. Firstly, as argued in the Background section, unlike other commonly studied financial behaviours – e.g. retirement saving which is unequivocally positive behaviour – borrowing is more ambiguous. The reasons why people borrow vary widely. Zinman (2015) refers to two general hypotheses regarding these reasons: income smoothing and impatience. Both might imply that borrowing is not necessarily a healthy or desired behaviour. Under the income smoothing hypothesis, consumers may be forced to borrow, so taking out credit is not an intentional, but rather an unwilling (imposed) decision. Impatience, in turn, is considered a negative attitude that can have adverse consequences. Moreover, there are many other examples of debt being a sign of a negative consumer behaviour. For instance, borrowing can be linked to impulsive purchasing habits. Hence, being a highly debt literate person, knowledgeable about the consequences of debt, may help in refraining from unnecessary and economically unjustified debt decisions. If so, then we should not expect a positive correlation between ODL and CMP. On the other hand, high debt literacy should facilitate the decision to enter the credit market when the economic circumstances support the expectation that wealth accumulation can be levered by debt. In other words, ODL should help to correctly estimate and evaluate net benefits resulting from borrowing funds. Therefore, it seems reasonable to assume that highly debt literate persons can be among those who participate in the credit market as well as among those who do not.

Secondly, perhaps we evidenced the insignificance of ODL in models explaining CMP because it matters what we mean by 'credit'. As mentioned in the Method section, we used CMP as a binary variable in our investigation and we classified as credit market participants all respondents who reported that they took out credit, regardless of the lending entity and the type of credit. In fact, the entities listed in our questionnaire differed significantly (from banks to Ponzi-scheme-like institutions). Prior studies (Brown and Graf, 2013, for instance) suggest that even the distinction between mortgage loans and consumer loans (i.e., non-mortgage loans) may matter for the strength and vector of the relationship between financial literacy and incidence of debt.

Thirdly, Chen and Chivakul (2008) demonstrate an analytical framework in which the decision to enter the credit market is a multistage process determined by both demand for credit and supply of credit. This multistage nature of the process results in that 'there are many ways in which the observed debt holding may take a value of zero' (Chen and Chivakul, 2008, p. 7). Chen and Chivakul hypothesize a set of variables that are critical for 'having debt' or 'not having debt', such as current income, net wealth, age and education (financial literacy is not among them). What is particularly important in the discussion on the insignificance of ODL in explaining the CMP observed in our research, is that many consumers who do not participate in the credit market, desire debt, however they are credit constrained because of the rejection of their applications by the lenders. We cannot rule out the possibility that such credit constrained consumers are heterogeneous in terms of debt literacy and, therefore, we should not expect a strong relation between ODL and CMP.

Our study joins a growing body of literature suggesting that subjective financial literacy – or financial confidence – deserves to be considered separately from objective debt literacy and should be given isolated consideration as a construct that can have explanatory power above and beyond the power of objective debt literacy in studies of financial behaviour (Parker et al., 2012; Anderson et al., 2015; Allgood and Walstad, 2016). Interestingly, in spite of ODL being insignificant in models explaining CMP, we found a significant and positive link between SDL and CMP. Unlike ODL, which is a cognitive item, SDL is rather an affective construct similar to self-efficacy (Parker et al., 2012). As such, SDL can reduce hesitation and in this way it can facilitate taking an action – for instance, entering the credit market, as observed in our research. Also, the similarity to self-efficacy can result in more risk-taking behaviour induced by an increased level of financial confidence. And this could explain why we evidenced a significant positive association between SDL and CMP (i.e., risky financial behaviour) in our study.

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It is argued that educational qualifications affect the likelihood of CMP through both the demand channel and supply channel. The level of education may influence a consumer's demand for debt because education reduces the costs of entry into the credit market (for instance, the costs of collecting and processing appropriate information – see Magri, 2002). The educational attainment may also matter for suppliers of debt since they can use the level of education as a proxy for future earning potential and, hence, as a factor relevant in credit worthiness evaluation (Chen and Chivakul, 2008). However, the evidence on the link between educational attainment and CMP is mixed (Magri, 2002; Del-Rio and Young, 2005; Chen and Chivakul, 2008). We believe that this is so due to mechanisms similar to those observed between actual financial literacy and CMP (especially that these two variables were found to be significantly and positively linked in our study). For instance, Magri (2002) notes that the evidence depends on the type of household debt financing (mortgages vs. consumer loans) which is studied. She found a positive relationship between formal education and the incidence of mortgages and null effect for consumer loans. This supports the findings of Brown and Graf (2013) regarding the link between financial literacy and the incidence of mortgages in Switzerland. Magri (2002) argues that such a result can be explained by the fact that the entry costs are significantly lower when consumers apply for non-mortgage loans. Additionally, in contrast to general formal education examined by previous researchers, formal financial education is unobservable for credit suppliers so they cannot ration the credit on the basis of FFE (while it is possible in the case of formal general education).

Finally, we confirmed that credit market participation can be driven by informal financial education, including the informational support of other consumers. It is worth noticing that our results disclose an interesting picture of key factors that drive household borrowing. The attitudinal and behavioural factors (ATTIT, TRUST, IFE) are considerably more important in explaining the CMP of our respondents than strictly cognitive variables linked to education and knowledge (FFE and ODL). Therefore, in light of our results, CMP depends primarily on how individuals perceive debt (as positive or negative), their trust in lending entities and the opinions of other people about borrowing and debt-related issues.

6   Acknowledgement

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Appendix: Debt literacy test

Q1: The effective interest rate is always higher than the nominal interest rate for the same loan.

Q2: According to the law, the borrower has the right to cancel a credit agreement within 10 days of signing.

Q3: Interest rates are currently the lowest since the fall of the People's Republic of Poland.

Q4: A personal loan company, unlike a bank, does not have to inform its clients about the APY.

Q5: According to anti-usury law, the maximum nominal interest rate that can be imposed on a loan is 20% per annum.

Q6: Assume that the interest rate of a loan was 50% yesterday and today it is 60%. This means that the interest rate has increased by 10%.

Q7: Like banks, personal loan companies are supervised by the Financial Supervision Authority.

Q8: Say that you consider a loan with one year duration which can be repaid either on a monthly basis or as a one-off payment at the end of the year. In both cases the loan has the same APY.

Q9: The list of public warnings being published by the Financial Supervision Authority contains the names of people having difficulty in repaying their loans.

Q10: The "favour (mercy) period" is the period of time negotiated with a bank during which the borrower doesn't have to repay the loan.

Q11: Usury is a form of high-interest-bearing loan.

Q12: Bank's margin is another name for the commission charged by the bank when granting a loan.

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A PHENOMENON OF CORPORATE BANKRUPTCY IN POLAND DIRECTIONS AND CAUSES OF CHANGES

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Abstract
From the point of view of economics, bankruptcy means a situation of an enterprise in which it is unable to pay its liabilities in a timely manner, and the value of its assets is not enough to cover them. In this situation the creditors are less interested in the continuation of the company's operations and more in whether its assets are enough to satisfy their financial claims. The paper attempts to present the phenomenon of bankruptcy of enterprises in Poland and its impact on safety of business entities. As part of the deliberations the areas and sources of occurring risks were presented, their general division was made at the same time indicating the consequences of their implementation, including bankruptcy. The analysis of the phenomenon in Polish conditions is presented in the time scale taking into account the legal form of failing entities, the industry within which they conduct their activities and their regional location. The replication is the results of own research aimed at assessing the scale of the presented phenomenon by the business community and the degree of resulting threats to the activities of business entities.

Keywords
Bankruptcy, Bankruptcy risk management, Causes of bankruptcy, Scale of bankruptcy.

JEL classification
G32, G33, F37

1   Introduction

Bankruptcy as an inseparable element of the Polish economy is a relatively new phenomenon. The economic transformation from the turn of the 80s and 90s restored the proper role of the mechanism of natural economic selection which displaces unprofitable enterprises that have problems with meeting the requirements of the market economy shaped by a huge number of variables. One can try to divide them into those that are at least partially determinable and those in which such attempts prove ineffective. Difficulties in this field are a consequence of the occurrence of a risk phenomenon whose implementation extreme cases may lead to the bankruptcy of the endangered entity with concurrent consequences for the business environment where the declining entity operates. These consequences include the deterioration of the economic situation of entities cooperating with the bankrupt, but they can be a cause of subsequent bankruptcies. Due to the above, this issue is increasingly the subject of research and deliberations conducted by the scientific community, which in the formulated conclusions indicate some possibilities of comprehensive protection of enterprises' interests by minimizing the risk occurrence and, in the event of its occurrence, limiting the effects of its implementation.

The growing importance of bankruptcy in the conditions of increasing competition, both domestic and foreign one, makes this issue an important point of consideration for economic practitioners. Associations of companies operating in global economic systems cause that bankruptcy affects not only the stakeholders of a given entity, the local community where it conducts its activity, but more and more often the regional, macroeconomic or even global environment.

The aim of the paper is to analyze the phenomenon of bankruptcy of enterprises in the Polish economy over the years 2010 - 2017 and an attempt to identify changes taking place in this area.

2   Literature review

Running a business regardless of its scope and size in most cases is burdened with high risk whose sources should be sought in both the organization itself and its environment. Risk is defined as the

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probability of the consequences of certain events resulting in a negative impact on the individual's ability to achieve its goals or adopted strategies (McNeil et al, 2015). Most often different types of risk are separated from each other, they appear in different parts of the company and relate to its different functions. What unites them in the case of risk implementation are the negative consequences that the organization feels as a whole, especially in the case of serious damage, threatening profits, property or even the existence of an enterprise. The rapid pace of the development of science and technology, by shaping the relations of production, increases the size and significance of risk and disseminates its manifestations, which makes it possible for decision makers and actions to be reckoned with (Nietyksza, 1971). Each time one should strive to make the risk more predictable. It cannot be avoided, but it can be managed (Laster, 2000). Therefore, it is important that each entity is aware of the risk-taking possibility whose consequence may be its share in direct and indirect losses (Dankiewicz, 2017). An analysis of entrepreneurs' opinions in Poland allows identification of key reasons for bankruptcy which should undoubtedly include: missed investments (42%), long-term payment delays (39,8%), bankruptcies of counterparties (36,8%), unfair competition (35,4%), errors of the management staff (34,4%), an extension of payment deadlines (33,2%), a drop in demand (28,6%), a lack of qualified staff (25,8%), tax and legal changes (23%), a lack of experience in business management (20,8%) (Karella Research Report, 2018). Entrepreneurs are increasingly aware of the potential consequences of risk realization, while at the same time they pay attention to the fact that they often do not have formal action plans in case of its implementation (Aon Report, 2018). They perceive an increase in demand for information and are aware that current and well-processed information is an important asset and the most important element of the decision-making process.

In developed countries, the first research whose subject was an analysis of the phenomenon of bankruptcy and its sources were initiated in the United States, and are dated to the beginning of the twentieth century. As early as 1908, Rosendale tried to assess the risk of companies insolvency based on their current assets. Further works on forecasting bankruptcy of enterprises using index analysis with separate use of particular indicators were conducted by Ramser and Foster in 1931 (Barbro et al, 1997), Fitzpatrick (1932) and Smith and Winakor (1935). The breakthrough moment was the publication of Altman (1968) where he analyzed the simultaneous impact of several indicators on the financial condition of the company thanks to their combination in one score, so-called Z-score. For this purpose he used the multidimensional linear discriminant analysis technique. The emergence in the seventies and early eighties of logit and probit analysis in the study of bankruptcy led to the criticism of the above technique (Chesser, 1974), (Daniel, 1977), (Ohlson, 1980), (Zavgren, 1983).

The next period of changes is the beginning of the nineties, then the development of analytical tools that enabled the analysis of larger data sets and forced the search for more and more effective methods of analysis. In the developed models, apart from financial parameters obtained on the basis of financial statements over time, factors related to macroeconomics, business parameters and corporate governance were also taken into account. This influenced their efficiency (Grunert et al., 2005) (Dyrberg, 2004), (Lee et al., 2003). The proposed models could be of a universal nature based on data from companies operating in various sectors or adapted to the specifics of the analyzed enterprises and then they were characterized by greater efficiency while not being able to compare the insolvency risk between different groups of enterprises (Altman and Narayanan, 1997). The vast majority of available publications concerns the premises for the construction and elements of bankruptcy forecasting models developed on the basis of parameters selected by the authors (Arroyave, 2018) (Grünberg and, Lukason, 2014), (Voronova, 2012) (Pociecha and Pawełek, 2011), (Stundžiene and Vytautas, 2006), (Korab, 2001), (Hajdu and Virag, 2001). Relatively few publications present the phenomenon of bankruptcy in terms of its causes, costs or directions of changes in time (Boratyńska, 2009), (Suraj-Sołtysiak and Sołtysiak, 2008), (Grzegorzewska, 2008), (Chłodnicka, 2004).

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3   Methodology and data

The analysis of the bankruptcy of enterprises in Poland was based on historical data from 2010-2017 obtained from the Central Statistical Office. In the research the method of meta-analysis, which was extended by a systematic review of the literature on the subject, was applied. The exploratory research allowed a description, visualization and an analysis of the situation on a sample of 6,562 entities that declared bankruptcy and constituted 100% of the sample from the Polish market, which is presented in Table 1.

Table 1. Distribution of bankruptcies of enterprises in Poland in monthly cross-section (2010-2017)

Year	N	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2010	691	53	59	70	49	72	64	65	40	63	61	60	35
2011	730	64	59	70	62	63	57	76	56	64	56	62	41
2012	941	68	79	80	73	95	77	75	76	58	93	86	81
2013	926	90	76	74	88	70	85	98	66	66	85	70	58
2014	822	63	72	64	65	79	76	79	62	71	81	49	62
2015	747	61	60	79	60	75	61	69	62	47	55	57	61
2016	805	51	54	68	66	63	60	73	68	86	66	73	77
2017	900	69	77	78	67	56	71	93	80	82	80	73	74
suma	6562	519	536	583	530	573	551	628	510	537	577	530	489

Source: author's own study based on data from Central Statistical Office.

In the analyzed period of 2010-2017 companies declared bankruptcy most often in July (on average one in ten bankruptcies in this month). Nevertheless, the time of declaration of bankruptcy is not related to the calendar year as it can be seen that for each of the individual quarters of the year there was about 1/4 of the bankruptcy of entities. Correspondingly for the subsequent quarters these values were: 24.94666%, 25.20573%, 25.52575%, 24.3285%.

The structure of entities that in the analyzed period declared bankruptcy including their legal form was presented as follows: LLC (58.4%), a natural person (22.6%), a joint-stock company (7.8%), general partnership (4.2%), limited partnership (2.6%), a cooperative (2.1%) , a civil partnership (1.4%), others (0.9%). In the industry section, the largest number of bankruptcies concerned production activities (25.5%) and services (24.3%) followed by construction (21.6%), wholesale (16.1%), retail sales (8.8%) %) and transport (3.6%). Divided into provinces, taking into account the amount and percentage in total, the structure is presented as follows: Lubuskie (132 2%), Świętokrzyskie (140, 2.1%), Opolskie (210, 3.2%), Warmian-Masurian (218, 3.3%), Podkarpackie (232, 3.5%), Łódź (241, 3.7%), Podlasie (256, 3.9%), Pomeranian (268, 4.1%), Lubelskie (277, 4.2%), Kuyavian-Pomeranian (337, 5.2%), West Pomeranian (495, 7.5%), Greater Poland (529, 8.1%), Lesser Poland (571, 8.7%), and Silesia (707, 10.8%), Lower Silesia (733, 11.2%), and Masovia (1216, 18.5%).

The supplementation of the above data are the results of a pilot study on the economic security of enterprises associated in the Podkarpackie Business Club. The surveyed population included 147 enterprises belonging to small (14.3%), medium (72.8%) and large (12.9%) companies that answered the question in the period from January to March 2017. In the research a questionnaire and direct interview were applied as the observation technique. The surveys were the most effective form of data collection, often not available in any other way. Their use was supported by a possibility of the current clarification of possible complexities of the wording and the speed of obtaining data.

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4   Empirical results

The phenomenon of bankruptcy is a significant problem in the operation of enterprises whose scale and scope of which are subject to constant changes which are influenced both by the internal policy of enterprises and their market environment. The results of own research conducted as part of enterprises associated in the Podkarpackie Business Club prove that the majority of entrepreneurs, i.e. 94.6%, see other entities in their environment, while 24.5% declare that the consequences of these bankruptcies had an impact on their own results. Within the studied group over the last five years, slightly more than 2% of respondents declared that their entities were at risk of bankruptcy. Virtually all respondents recognize the necessity of ongoing analysis of the situation both inside a company and in its surroundings to identify potential threats that may constitute a premise to declare bankruptcy in the future.

At the same time only 35.4% declare that they are prepared for such eventuality and have risk management procedures in place. In some areas the degree of preparation can be much higher, which is confirmed by the results of other studies that prove that over several years from 2009 to 2018 in Poland the percentage of enterprises that declare that they have an action plan in the event of non-payment for rendered services or delivered goods grew in a significant way from 36% to 68% (in the years 2013-2014 this percentage was even 73%) (Aon Report, 2018). At the same time it should be pointed out that each year the bankruptcy interest, being a consequence of problems with payments, fluctuates around 20%. That is why entrepreneurs often support the processes of managing an offer of external entities in this area, mainly insurers, thanks to which it is possible, among others, to extend payment terms, with an acceptable level of risk of non-payment of receivables from contractors (ICISA, 2015). However, despite the awareness of threats, often created strategies in the event of problems, the phenomenon of bankruptcy is a natural element of the free market economy occurring with varying intensity over time. An analysis of the phenomenon in the Polish market allowed presenting trends occurring in time, which are shown in Figure 1.

year	N	bankruptcy
2010	691	10.53%
2011	730	11.12%
2012	941	14.34%
2013	926	14.11%
2014	822	12.53%
2015	747	11.38%
2016	805	12.27%
2017	900	13.72%
total	6562	100%
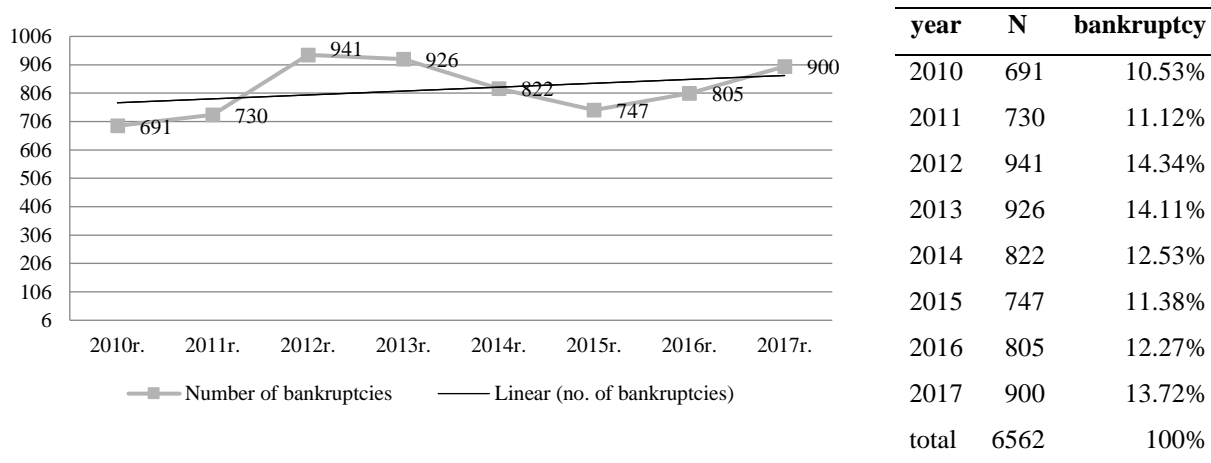
Fig. 1. Bankruptcies of Polish enterprises in 2010-2017 (Source: author's own study based on data from Central Statistical Office).

The conclusions allow stating that in the last two years Poland has observed a disturbing upward trend in the phenomenon of bankruptcy. At the same time there is no basis for inferring the linear trend that the number of bankruptcies has been increasing over the last eight years. Similarly, there are no grounds to conclude that the number of bankruptcies is directly related to the situation in the economy, as shown in Figure 2.

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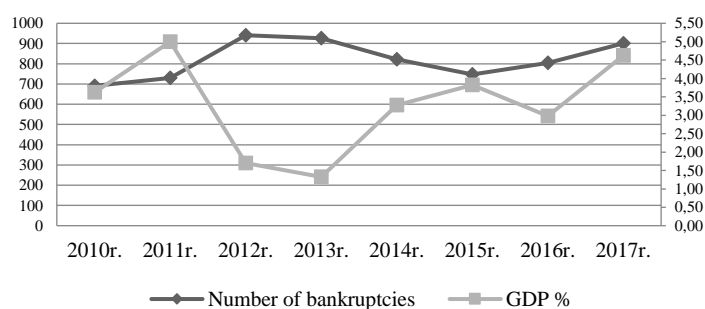
Fig. 2 Relationship between the number of bankruptcies of Polish enterprises and GDP in Poland
in 2010-2017 (Source: author's own study based on data from Central Statistical Office).

The presented data do not show correlation in the general cross-section, which is clearly confirmed by the above chart, based on which it is impossible to define a trend in the analyzed period of eight years. However, in the last two years one can observe a dangerous upward trend in the number of bankruptcies in Poland which extinguished a favorable trend from 2012-2015. The crisis years in terms of the number of bankruptcies of enterprises were: 2012, 2013 and 2017. In this period the number of bankruptcies successively exceeded the average national trend oscillating around 12.5%. Statistical data shows that bankruptcy is most often announced by LCCs although over the years 2010-2017 a downward trend is observed among them from 67.9% to 53.6% of total bankruptcy. In the case of joint-stock companies a relative stabilization can be seen as the interest calculated ranges between 6-10%. At the same time, a gradual upward trend in the percentage of personal bankruptcies is noticeable, and over the years 2010-2014 it increased by as much as 11 percentage points in the total number of bankruptcies. The data of the Central Statistical Office indicate that in the years 2010-2017 the most severe bankruptcies affected: production – 25.5% (1675 cases), services – 24.3% (1596 cases), construction – 21.6% - (1416 cases)), wholesale – 16.1% (1059 cases), retail sales – 8.8% (579 cases) and transport – 3.6% (236 cases). The detailed schedule in time is presented in Table 2.

Table 2. Business bankruptcies in Poland in 2010-2017 in the industry section

Industry	N	2010	2011	2012	2013	2014	2015	2016	2017
Construction	1416	114	146	273	253	184	146	149	151
Production	1675	233	218	220	233	181	180	191	219
Services	1596	135	150	191	192	209	205	237	277
Transport	236	32	17	35	28	32	41	21	30
Retail sale	579	66	60	84	70	87	64	73	75
Wholesale	1059	110	139	138	150	129	111	134	148
Total	6561	690	730	941	926	822	747	805	900

Source: author's own study based on data from Central Statistical Office.

The most unsafe sector in the analyzed period was production, especially in the initial time periods (in 2010 the percentage in relation to the total was as much as 33.8%). When analyzing the above data, the attention is drawn to the construction industry. In the years 2012 -2017 there was a noticeable trend according to which the share of entities announcing bankruptcy was systematically decreasing. As compared to 2012 one could notice a lower rate of over 12 percentage points. In 2010-2012 there was a visible reverse trend which suggested that the construction industry in Poland was worse. At the same time, the attention should be paid to the phenomenon of a systematic increase in the number

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of bankruptcies declared in the services sector (r=0,955, p<0,001). This is the only observable trend throughout the analyzed period 2010-2017, the so-called the full trend. Other sectors: production, transport and sales are characterized by stepped trends.

5 Conclusion

The phenomenon of bankruptcy, its causes and potential consequences are currently an important area of an analysis regarding the subject of risk management in enterprises. Decision-makers are more and more aware of the fact that the reasons for this phenomenon often originate in the company environment, and decision-makers may not be able to influence it. Therefore, the analysis of the phenomenon and the search for tools used as part of the risk management procedures that enable securing oneself against it is an important element within the management processes in enterprises. Despite the fact that the institution of bankruptcy in Poland was introduced relatively late, currently entrepreneurs are more often involved in the work on particular types of risk whose may be bankruptcy, and they use global patterns of action.

The analysis of the phenomenon of bankruptcy of enterprises in Poland shows that the level of this phenomenon varies depending on the region of activity of the surveyed enterprises, the industry they represent and their legal form. The degree of bankruptcy of enterprises is additionally dependent on the number of enterprises operating in specific areas. In terms of volume the larger the number of registered entities, the greater the scale of bankruptcy. At the same time, there are no grounds to demonstrate long-term trends showing the relationship between the number of bankruptcies and the situation in the economy. In most cases, bankruptcies appear with varying intensity at different intervals of time.

An impact of the bankruptcy of enterprises on the economic situation of entities in Poland justifies the need to conduct and expand the scope of further research regarding the issues of bankruptcy.

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ECONOMIC AND WAGE CONVERGENCE WITHIN EU COUNTRIES

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Abstract
The phenomenon of economic convergence in the European Union has been abundant and frequent topic, both in professional circles and among the lay public. Despite the high degree of integration of European regions, the EU is still an area where significant differences in key economic indicators exist across Member States. The aim of the paper is to evaluate the process of economic convergence within the European Union based on the analysis of the economic and wage level development and the evaluation of the Czech Republic's position in this process. Based on econometric modelling of β-convergence, it has been found that the countries surveyed converge to a common steady state, which is defined as the EU average economic and wage level. Empirical results also show that economic level convergence is proceeding faster than wage convergence. The results of the analysis further prove the convergence of the Czech Republic to the average economic and wage level of the most advanced euro area countries (EA-6), although in the terms of speed of the convergence the Czech Republic is lagging behind other CEE countries, especially Estonia, Lithuania, Latvia and Slovakia.

Keywords
β-convergence, Convergence, European Integration, Steady State.

JEL classification
C10, C20, C50

1   Introduction

The subject of real convergence has been widely debated in the context of European integration, with a special emphasis on the convergence of the economic level in recent years. This is related in particular to a large enlargement in 2004 when a total of 10 new states with a relatively low economic level with respect to the old Member States have been joining the European Union. Efforts to reduce the disparity of economic levels between Member States were further enhanced by the accession of the less developed economies of Bulgaria and Romania in 2007 and then Croatia in 2013.

The main aim of this paper is to evaluate the process of real convergence within the European Union based on the analysis of the economic and wage level development and the evaluation of the Czech Republic's position in this process.

2   Literature review

In the economy, there are many theories and ways to measure the performance of different economies or regions. For analysis of economic performance of the unions or integrations, such as the European Union, convergence is a much studied hypothesis. Studying and analysing convergence between EU economies attracts many researchers (Dvoroková, 2014; Haviernikova, 2014; Melecký, 2015; Soukiazis and Castro, 2005; Staníčková, 2015). Economists split the convergence analysis into two categories: nominal convergence and real convergence. In general, nominal convergence can be defined analogously to real - while real convergence is characterized by the approximation of real variables, we understand nominal convergence as the convergence of nominal values (GDP at current prices, nominal wages etc.).

The wage indicator has been selected as an important indicator of living standards in individual countries. Wage convergence is a very frequent topic across practically all Central and Eastern

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European countries, but most analyses are carried out on nominal wages, i.e. in euros - for example, the Office of the Government's analysis of the current institutional development of the euro area and the related new risks and opportunities for the Czech Republic (Úřad vlády České republiky, 2017) or Convergence of wages between old and new members of the EU, the role and objectives of unions in this process (ČMKOS, 2016).

The analysis of wage developments in nominal terms (in euros) then reflects the external purchasing power of wages and the price competitiveness of the economy. However, in the work, we are focusing on the convergence of the standard of living between the countries surveyed, and for this purpose, it is much more appropriate to use wages in real terms, that is, in the parity of the purchasing standard. The Czech National Bank also considers the relative wage level as an important indicator of real convergence in its regular document Analyses of the Czech Republic's current economic alignment with the euro area (CNB, 2017).

3 Methodology and data

The following chapter is divided into two parts. The methodology for economical level convergence research is elaborated separately, as well as the methodology for examining wage convergence, which is elaborated in a separate subchapter also.

3.1 β-convergence of the economic level

The basic approach to convergence research in this paper is a cross-sectional analysis, with the econometric model being compiled for three time periods:
- Base period (1995-2016),
- The period before the Great Enlargement (1995-2004),
- The period after the Great Enlargement (2005-2016).

The logic behind this time division is to gain a closer look at the convergence process in the period before and after most of the Central and Eastern European countries joined the EU. We realize that it would be advisable to specify the periods of the economic crisis, but further fragmentation of the observed time periods would, due to the approach used in the cross-sectional analysis, lead to a reduced propensity of the model.

For the purposes of the cross-section analysis of β-convergence in the empirical part of the paper we use this equation:

$$\frac{1}{T} log \left(\frac{y_{i,T}}{y_{i,0}}\right) = \alpha + \beta log\left(y_{i,0}\right) + \varepsilon_i, \tag{1}$$

where T represents the length of the reference period, $y(i,T)$ is the economic level at the end of the reference period for a given country i, $y(i,0)$ is the economic level at the beginning of the reference period for a given country i, α is the level constant, β is slope parameter, ε is random variable.

Statistical data for the cross-sectional β-convergence model was drawn from the World Development Indicators (The World Bank, 2018). In the model, we are working with a per capita GDP at constant 2010 prices in international dollars, with data freely available in the reference period for all countries and there are no missing observations in the model. Testing the β-convergence concept is carried out on a sample of EU countries26 (all EU28 countries except Luxembourg and Ireland, which we have decided to exclude from the model because of remote values and specific structural parameters of the economy).

To obtain the dependent variable $\left(\frac{y_{i,2016}}{y_{i,1995}}\right)$ it is necessary to calculate the GDP per capita shares in 2016 and 1995 for all the countries separately. The resulting shares are then logarithmized and divided by the number of years of observation, in this case by the number 22. The resulting vector is the dependent variable in the regression equation (1). Similarly, we proceed in the calculation of the dependent variable even in the models representing partial time periods (1995-2004 and 2005-2016).

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SPSS statistical software is used to estimate the model and other calculations. The model is estimated using the Ordinary Least Squares (OLS) method, and the results for all three time variants of the model are summarized in the following chapter.

3.2 β-convergence of the wage level

Unlike the β-level economic convergence model, the model will only be compiled for the base period (1995-2016). Due to the purpose of the work and the character of the studied quantity we consider this approach to be quite sufficient. As in the case of the previous model, even in the framework of the wage level convergence analysis, it is based on the mathematical relationship (1). However, the wording will be adjusted, the variable expressing of the economic level will be replaced by the wage level indicator. We write the adjusted equation as follows:

$$\frac{1}{T} log \left(\frac{w_{i,T}}{w_{i,0}}\right) = \alpha + \beta log w_{i,0} + \varepsilon_i, \tag{2}$$

where the left side of the regression equation expresses the average wage growth in the given country also in the period 0 (beginning of the reference period) to T (end of the reference period), which is negatively dependent on the initial wage level *wi, 0*. Negative dependence between variables is shown by the negative sign of parameter β - in this case we are talking about β-convergence of wages.

For the purposes of measuring wage convergence, the *Compensation of employees per hour worked indicator* was selected from the Eurostat database (Eurostat, 2018). The indicator of average hourly compensation for employees is defined as the total amount of remuneration paid by the employer to the employee for the work performed. Therefore, the wage, employee benefits and social and health insurance paid by the employer are included in the indicator. Including social and health insurance can be a mild disadvantage of this indicator in international comparisons, as the weight of social contributions is different in each country. On the contrary, we consider the fact that the indicator is reported in terms of hour worked, which makes it possible to abstain from differing working hours in individual countries.

In the analysis, the values of this indicator in PPS are used to take into account the purchasing power of wages in the domestic market. The country sample consists of the 25 EU Member States (EU-25), with the exception of Estonia, Poland and Malta, omitted due to lack of observation.

To obtain the dependent variable $\left(\frac{w_{i,2016}}{w_{i,1995}}\right)$ it is necessary to calculate the wage levels in the years 2016 and 1995 for each country separately. The resulting shares are then logarithmized and divided by the number of years of observation, i.e. by number 22. The resulting vector then represents an explanatory variable in the model.

SPSS statistical software was used to estimate the model and related calculations. The model parameters were estimated using the OLS method, and the results of the estimation are summarized in the following chapter.

For statistical verification of both economic and wage level convergence models, we use the F-test and for statistical verification of the individual parameters in the model we use the t-test. In the framework of the econometric verification of the model we proceed the testing based on Gauss-Markov's theorem. It sums up the conditions on the suitability of OLS method for model estimation as well.

4 Empirical results

The following chapter is divided into two parts. The first subchapter summarizes the results of the estimated model for economic level convergence, which was subjected to statistical and econometric verification. The next subchapter is devoted to the results of the model for the convergence of wages. Like the previous model, testing the convergence of wages was subjected to statistical and econometric verification as well.

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4.1 β-convergence of the economic level

SPSS statistical software is used to estimate the model and other calculations. The model is estimated by the OLS method, and the results for all three time variants of the model are summarized in the following table 1.

Table 1. Summary of the β-convergence model of the economic level

Model	R	R^2	Adjusted R^2	SE of the Estimate	R^2 Change	F Change	Sig. F Change	Durbin-Waston
1995-2016	0.861	0.742	0.731	0.002986	0.742	68.942	0.000	1.583
1995-2004	0.767	0.588	0.57	0.003997	0.588	34.201	0.000	1.626
2005-2016	0.714	0.509	0.489	0.004243	0.509	24.914	0.000	1.679

Source: own elaboration, 2018

The value of the correlation coefficient R indicates the force of interdependence between the variables in the model. For the 1995-2016 period, therefore, the average GDP growth per capita of the countries surveyed is 86.1% depending on the explanatory variable, i.e. the GDP per capita.

In terms of model quality, however, it is more important to observe the determinant coefficient R^2, which gives the degree of explanation of variability in the model. For the 1995-2016 model, we can interpret it as an explanatory variable (GDP per capita in 1995) explains the average GDP growth per capita of the monitored countries in the above-mentioned period of 74.2%.

The purpose of the cross-sectional analysis of the β-convergence of the economic level was to find out whether the economic levels of the EU26 countries at a given time intervals were approaching the common steady state. The convergence or eventual divergence of the monitored sample of countries is then signalled by the sign of the estimated parameter β. By performing a regression analysis in SPSS, the following models of economic-level convergence were estimated for each reporting period:

$$\frac{1}{22} log \left(\frac{y_{i,2016}}{y_{i,1995}}\right) = 0{,}103 - 0{,}022 \cdot log(y_{i,1995}), \qquad (3)$$

$$\frac{1}{10} log \left(\frac{y_{i,2004}}{y_{i,1995}}\right) = 0{,}095 - 0{,}019 \cdot log(y_{i,1995}), \qquad (4)$$

$$\frac{1}{12} log \left(\frac{y_{i,2016}}{y_{i,2005}}\right) = 0{,}110 - 0{,}024 \cdot log(y_{i,2005}). \qquad (5)$$

It can be seen from the above relationships that the tested sample of countries in the monitored periods actually converged towards the common steady state, in this case the average economic level of the European Union, because the value of the coefficient β is negative in all three cases.

We also note that the theoretical concept of absolute convergence was confirmed on the tested sample of countries, as the average GDP growth per capita is negatively dependent on the initial economic level of the country in the observed period.

Table 2. Economic convergence rate

Model	N. of countries	β	Sig.	R^2	Convergence rate	Results
1995-2016	26	-0.022	0.000	0.701	1.75%	β-convergence
1995-2004	26	-0.019	0.000	0.490	1.73%	β-convergence
2005-2016	26	-0.024	0.000	0.509	2.09%	β-convergence

Source: own elaboration, 2018

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The results of cross-sectional models of β-convergence of economic level are summarized in Table 2. The value of parameter β is negative for all tested models, indicating the convergence of the monitored sample of countries to a common steady state, which we understand in this context as the EU-26 average economic level.

The table also contains the calculated rate of convergence in the individual reference periods that was obtained on the basis of the following relationship:

$$\frac{1}{T}\log\left(\frac{y_{i,T}}{y_{i,0}}\right) = \alpha - \left(\frac{1-e^{-\beta.T}}{T}\right) \cdot \log y_{i,0} + \varepsilon_i, \tag{6}$$

where the designation of individual variables and parameters is identical to those in equation (1). The coefficient β in the above-mentioned relationship indicates the convergence rate to the steady state, in this case the average EU-26 economic level. Therefore, the rate of convergence can be defined as a percentage reduction of the gap between the current and the steady state in one year.

Table 3. Average rate of economic growth of selected economies in individual periods

Period	Rank	Fastest growing economy	Growth rate	ΔGDP per capita		Slowest growing economy	Growth rate	ΔHDP per capita
1995-2016	1.	Lithuania	5.35%	198.64%	1.	Italy	0.22%	4.67%
	2.	Latvia	5.14%	186.44%	2.	Greece	0.63%	14.01%
	3.	Estonia	4.41%	147.41%	3.	Cyprus	0.81%	18.39%
	4.	Poland	4.05%	130.4%	4.	France	0.99%	23.04%
	5.	Slovakia	3.86%	121.58%	5.	Denmark	1.01%	23.51%
1995-2004	1.	Latvia	7.33%	89.03%	1.	Germany	1.18%	11.19%
	2.	Estonia	6.91%	82.48%	2.	Italy	1.36%	12.91%
	3.	Lithuania	6.8%	80.82%	3.	France	1.77%	17.08%
	4.	Croatia	4.51%	48.73%	4.	Denmark	1.79%	17.27%
	5.	Poland	4.37%	46.95%	5.	Belgium	2.06%	20.2%
2005-2016	1.	Poland	3.84%	51.43%	1.	Greece	-1.79%	-18.05%
	2.	Lithuania	3.81%	50.83%	2.	Italy	-0.73%	-7.72%
	3.	Romania	3.59%	47.48%	3.	Cyprus	-0.65%	-6.93%
	4.	Slovakia	3.49%	45.91%	4.	Finland	0.09%	1.03%
	5.	Bulgaria	3.13%	40.32%	5.	Spain	0.11%	1.27%

Source: The World Bank (2018); own elaboration

The Baltic countries (Estonia, Latvia and Lithuania) are the most successful in this respect, showing the highest average growth in all the monitored economies in the period 1995-2016, see Table 3 (Baltic News Network, 2018). V4 countries achieved the best results in the economy of Slovakia and Poland. If we focus on a group of the most advanced countries, they most outweighed the average growth rate predicted by the Swedish and Dutch economy model.

An interesting addition to the above results could be the estimated time of convergence, i.e. the time horizon during which the Czech Republic will exceed the level of GDP per capita in the country. To estimate the Czech Republic's convergence period to the advanced euro area economies, it is necessary to first define different scenarios that will allow the future development of the convergence process to be predicted. The starting point for the determination of the individual scenarios will be the real GDP per capita development of the Czech Republic and EA-6, on the basis of which we define three starting periods for estimating the convergence time:

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- Scenario 1: The monitored economies will grow at the same rate in the future as in the base reference period 1995-2016,
- Scenario 2: The monitored economies will maintain the average growth rate in the period 1999-2016 in the future - we are abstracted from the economic crisis in the Czech Republic in the second half of the 1990s,
- Scenario 3: The monitored economies will maintain the average rate of growth from the 2010-2016 period.

It is implicitly inferred from the above scenarios that the prediction of the convergence process is based exclusively on past developments in individual periods, and we assume that the past average growth of the surveyed countries will remain constant in the future as well. It should be noted here that such assumptions are quite controversial, and the estimate can, of course, differ from actual future development.

Table 4. Estimation of the time of convergence of the economic level of the Czech Republic to selected countries

	Scenario 1	**Years**	**Scenario 2**	**Years**	**Scenario 3**	**Years**
Czech Republic	2.34%	-	2.60%	-	1.68%	-
Austria	1.30%	33	0.95%	21	0.40%	27
Belgium	1.22%	27	0.93%	18	0.41%	23
EA19	1.18%	18	0.90%	12	0.70%	21
EA6	1.23%	27	1.01%	19	0.96%	41
Finland	1.72%	38	1.05%	15	-0.14%	13
France	0.99%	15	0.70%	10	0.53%	17
Germany	1.32%	34	1.28%	26	1.56%	27
The Netherlands	1.47%	48	0.94%	25	0.63%	40

Source: The World Bank (2018), own elaboration

Table 4 shows the average growth of the monitored economies in the individual scenario periods and the number of years necessary for the Czech Republic to reach the economic level of other surveyed countries at steady growth rates. The most favourable scenario for the Czech Republic appears No 2, which is based on the period 1999-2016. If the average real GDP growth per capita during this period remained constant even in the future, the Czech Republic would reach the average economic level of the euro area member countries within 12 years and the average economic levels of the most advanced euro area members (EA-6) in 19 years.

The least favourable scenario for the Czech Republic is scenario 3, with the period of convergence to the economic level of Germany taking 27 years on the basis of the results for 2010-2016. It should be noted, however, that this is a comparison of the optimistic scenario from the point of view of Germany and pessimistic from the point of view of the Czech Republic. However, it is obvious that the process of convergence of the Czech Republic to the average economic level of the Eurozone and its most advanced members has slowed quite significantly due to the crisis.

4.2 β-convergence of the wage level

SPSS statistical software was used to estimate the model and related calculations. The model parameters were estimated using the OLS method, and the results of the estimate are summarized in Table 5.

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Table 5. Summary of the β-convergence model of the wage level

Model	R	R^2	Adjusted R^2	SE of the Estimate	R^2 Change	F Change	Sig. F Change	Durbin-Waston
1995-2016	0.881	0.777	0.767	0.00271	0.777	80.065	0.000	1.942

Source: own calculations in SPSS, 2018

The correlation coefficient R indicates that the development of wage levels in individual countries is from 88.1% dependent on the evolution of the independent variable in the model, i.e. the initial wage level in the economies under study. The coefficient of determination R^2 is interpreted in such a way that the explanatory variable (wage level in 1995) explains the average wage growth in the analysed economies for the period 1995-2016 of 77.7%. The results of the cross-sectional wage-level convergence model are summarized in Table 6. The negative value of parameter β signals the convergence of wage levels to the common EU-25 sample average.

Table 6. Wage convergence rate

Model	N. of countries	β	Sig.	R^2	Convergence rate	Results
1995-2016	25	-0.018	0.000	0.777	1.49%	β-convergence

Source: own elaboration, 2018

Comparing the results of the β-convergence models, it is clear that the convergence of the economic level to the common average is faster than the convergence of wages - the rate of convergence of the economic level in the 1995-2016 model was 1.75% per annum, while the rate of convergence of wages is only 1.49% per year. For a closer look at wage convergence, it is also worthwhile evaluating the process of converging wage levels to the EU average from country to country. These results are summarized in Table 7.

Table 7. Convergence of selected Member States 'wage levels to the EU-28 average

Country	Wage/hour EU28=100		Δ	Result	Wage/hour EU28=100		Δ	Result	Wage/hour EU28=100		Δ	Result
	1995	2004			2004	2016			1995	2016		
Cyprus	75	80	5	conv.	80	70	-10	div.	75	70	-5	div.
Czech Rep.	45	57	12	conv.	57	62	5	conv.	45	62	17	conv.
Denmark	117	118	1	div.	118	127	9	conv.	117	127	10	div.
France	129	128	-1	conv.	128	131	3	div.	129	131	2	div.
Greece	63	74	11	conv.	74	60	-14	div.	63	60	-3	div.
Hungary	42	49	7	conv.	49	51	2	conv.	42	51	9	conv.
Ireland	95	101	6	conv.	101	112	11	div.	95	112	17	div.
Latvia	24	32	8	conv.	32	52	20	conv.	24	52	28	conv.
Lithuania	25	39	14	conv.	39	54	15	conv.	25	54	29	conv.
Luxembourg	155	154	-1	conv.	154	159	5	div.	155	159	4	div.
Portugal	65	65	0	-	65	61	-4	div.	65	61	-4	div.
Slovakia	34	47	14	conv.	47	64	17	conv.	34	64	30	conv.
Slovenia	80	84	4	conv.	84	86	2	conv.	80	86	6	conv.
Spain	108	93	-16	div.	93	95	2	conv.	108	95	-13	div.

Source: own calculations based on Eurostat (2018)

The wage level in selected countries surveyed in the period 1995-2016 converges to the European Union average. Looking upwards from the EU-28 average, wage levels diverge in four countries - Denmark, France, Ireland and Luxembourg. Greece, Spain, Cyprus and Portugal diverge in the downward direction, Finland's wage level remained unchanged from the EU average.

If the average wage level growth of the 1995-2016 period would be maintained in the future, it would take the Czech Republic for about 33 years to reach the average wage level of the European Union. Noteworthy is the rate of convergence of Slovak wage level, which was the fastest of all the countries surveyed. The Slovak wage level overtaken the Czech one in 2010, and if the growth dynamics of the 1995-2016 period is maintained in the years to come, Slovakia will outperform the EU average wage level at the 15-year horizon (The Slovak Spectator, 2018).

It can be said that wage convergence is much slower than the convergence of the economic levels of the countries surveyed. There is also a disparity between the wage and productivity levels achieved in old and new member states, which exert pressure to further widen differences in wage levels.

5   Conclusion

The convergence of the economic and wage levels of individual Member States to the EU average was demonstrated on the basis of econometric modelling of β-convergence. In the case of the analysis of the β-convergence of the economic level, the model was divided into three sub-periods - the base period (1995-2016), the period before the great enlargement (1995-2004) and the period after the great enlargement (2005-2016). Given the vulnerability of β-convergence to biased values, Luxembourg and Ireland were excluded from the analysis, and the resulting model estimate was therefore performed on a reduced sample of EU-26 member countries. Parameter β was negative in all three cases, resulting in zero rejection and acceptance of the alternative hypothesis set for all three models: parameter β <0 - the EU-26 economic level in the period under review was converging to the EU average.

The econometric model of β-convergence of wage level was compiled exclusively for the base period 1995-2016. Due to missing observations, Poland, Estonia and Malta were omitted from the analysis, and the resulting model estimate was therefore carried out on a reduced sample of EU-25 member countries. Parameter β was negative and a zero rejection and acceptance of an alternative hypothesis for the wage-level β-convergence model: parameter β <0 - the wage level of the EU-25 countries in the reference period (1995-2016) converged to the EU average wage level.

Somewhat controversial is the assessment of the accession to the European Union and its impact on the process of convergence of the economic level for the countries that acceded in 2004. It can be assumed that accession to the EU had a definite positive effect on the development of the economic level in the Czech Republic and Slovakia, as the process of convergence of these countries to the EU average economic level was much faster in 2004-2016 than in the previous reporting period 1995-2004. In the case of Estonia, Hungary and Slovenia, the convergence process has slowed down after 2004, and Cyprus has even rather quickly diverged downwards from the average GDP per capita in the EU. However, it is necessary to emphasize that observations in the period 2004-2016 are distorted by the economic crisis, which has been differentiated by the impact of the impact on individual economies. It can be assumed, therefore, that the positive influence of EU accession was overshadowed in some countries by the strong negative impact of the economic crisis on the convergence process.

6   Acknowledgement

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CHINA IN THE WTO: THE IMPLICATIONS FOR THE CZECH TRADE AND INVESTMENT FLOWS WITH CHINA

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Abstract
Under the influence of its commitments in the World Trade Organization (WTO), China has continued to open up its economy after 2001 in the regime of the most favoured nation. As the Czech Republic is an open economy and also a WTO member, the object of the paper is to depict how the volume and structure of trade between Czechia and China has changed after China's entrance into the WTO and if the trade liberalization between both countries has contributed to more intra-industry trade or extra-industry trade. The results of the trade analysis are correlated with the lowering of tariffs in China and removing other barriers to trade. Besides the analysis, comparison and correlation of statistical data, the Grubel-Lloyd index was used in order to calculate the level of intra-industry trade between the considered countries. The trade analysis showed Czechia's lasting trade deficit with China in goods as well as services, especially due to the significant growth of Czech imports from China. The original hypothesis about intra-industry trade was not confirmed.

Keywords
International trade, Intra-industry trade, Market access, Trade balance, Trade liberalization, WTO.

JEL classification
F41, F53, F60, K33

1 Introduction

When China entered the World Trade Organization (WTO) on 11 December 2001 after 15 years of bilateral and multilateral negotiations, many countries hoped to get better access to China's market counting 1.3 billion people. On the other hand, China got the opportunity to participate in the forming of the multilateral trade rules and to draw advantages from the WTO membership. However, Panitchpakdi and Clifford (2002, p. 144) state that *China promised a great deal of market access, although it gained very little additional access from foreign partners in return*. On the whole, China's commitments in the WTO included lowering tariff barriers, removing non-tariff barriers, increasing transparency, opening its financial services market to foreign companies, enforcing intellectual-property laws and many others.

As the Czech Republic (hereinafter Czechia) is an European Union (EU) member state, the area of foreign trade belongs to the exclusive competencies of the EU institutions and is governed by the Common Commercial Policy. Although Czechia has recorded 76 % of the total trade turnover with the EU member states (UNCTADStat, 2018), China is the leading merchandise exporter in the world and the competitor of many countries with a similar trade structure. Although Czechia, as a part of the former Czechoslovakia, had already developed economic cooperation with China in history, the recent trade and economic cooperation with China is influenced by new factors in the world economy, which have a background in trade liberalization and the integration of markets. The object of this paper is to depict how the volume and structure of trade between Czechia and China has changed after China's entrance into the WTO and if the trade liberalization between both countries has contributed to more intra-industry trade or extra-industry trade. With respect to the fact that machinery and transport equipment is the main tradable commodity group of the Czech as well as Chinese imports and exports, there is the theoretical hypothesis that the bilateral trade

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between Czechia and China is more intra-industry than extra-industry trade. The rest of the paper includes a review of the previous literature published about the Czech-Chinese trade. The description of the methods and data used in the trade analysis is introduced in another part of this paper. The results of the trade analysis are presented and discussed in the fourth section. In conclusion, the main facts from all parts of this paper are summarized.

2   Literature review

When China entered the WTO in December 2001, many papers were published about it in the following years. Thus, the process of the bilateral and multilateral negotiations via the GATT/WTO Working Party was described, for example by Gertler (2002) or Qingjiang (2002). Panitchpakdi and Clifford (2002) have considered China´s entrance into the WTO from the aspect of the changing world under the influence of changing China. While Rumbaugh and Blacher (2004) examine trade and the potential implications of China´s increased role in world trade, Bachus (2011) reflects on the influence of China´s WTO accession on the domestic and the WTO related reforms. From China´s point of view, Walmsley, Hertel and Ianchovichina (2006) assess the impact of China´s WTO accession on foreign ownership. Contrary to this, many other authors, for example Fojtíková (2017), Leutert (2016), Lee, Walker and Zeng (2017), etc., analysed the influence of State-Owned Enterprises (SoEs) in China from different aspects. China´s opening up in the long history of 40 years was also explored by Ju and Ju (2018). Besides trade, these authors also consider foreign investment and global productivity sharing as the other possibilities of the incorporation of China into the world economic system.

Some authors focused only on one area of China´s opening up to the world. Thus, Lai, Qian and Wang (2016) focused on the financial sector in China and examined the relations between the foreign bank entry and the industry level productivity growth of China´s manufacturing sector. They state, among other things, that opening up a region for foreign bank entry has no impact on aggregate productivity growth and argue that the changes that occurred were the results of changes in technical efficiency rather than reallocation. The exploration of China´s compliance with its commitments in the WTO in the area of intellectual property rights was carried out by Thomas (2017) or Fojtíková (2018), who state that although China has implemented its commitments into the Chinese laws, the intellectual property protection has remained a serious problem until now, and they also point out that the implementation of laws is different than the compliance with the commitments, which is also connected with the effective enforcement of intellectual property rights.

While the topic of China in the WTO or the exploration of the Chinese trade from different aspects have been the subject of relatively frequent research, publications about bilateral trade between China and Czechia occur in a small number (see, for example, Fojtíková, Staníčková and Melecký, 2017). The reason for this can be seen in the lower impact on the world economy and also the geographical distance of Czechia from China can lower the interest in this topic.

On the contrary, the trade relations between China and the EU, whose member is also the Czech Republic, have been explored more often (Fojtíková, 2012; 2014; 2016). Zhang and Li (2006) examined intra-industry trade (IIT) between China and the EU-25 in the individual industries with data from 1999 to 2004 and found out that inter-industry dominates their trade. The value of the Grubel-Lloyd index and the level of the Chinese-EU IIT was less than the average level of China and the world. Only the manufactured sector reached a significantly higher IIT, especially in sectors with capital incentive goods. The following study done by Yan (2012) also showed a similar result and the improvement of IIT between China and the EU. Ding and Zhong (2016) examined IIT between China and the EU in services from 2002 to 2012 and their study showed a significant difference of IIT in services in the EU countries.

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3   Methodology and data

The methodology of this paper is based on the idea that trade liberalization enables to get better access to the markets of other countries and, in this way, supports international trade. Thus, the fulfilment of China's commitments in the WTO meant removing barriers to trade on the multilateral principle, i.e. in the regime of the Most-Favoured Nation (MFN). Based on this fact, the companies from the Czech Republic, which is also a WTO member, have got an opportunity to trade with China on an equal base as companies from the U.S., Germany, France, Italy and other countries around the world.

The subject of the analysis of this paper was recording the changes that have occurred in the volume and structure of bilateral trade between the Czech Republic and China after China's entrance into the WTO and finding if their bilateral trade was more inter-industry (IIT) or extra-industry. The size of intra-industry trade was carried out using the Grubel-Lloyd Index (GLI). This is a useful indicator of *how much trade is of the Krugman-type, i.e. two-way trade of differentiated varieties* (WTO, 2012, p. 44). Although there are some modified versions of the GLI (for example Widodo, 2009), the analysis of intra-industry trade in this paper is based on the basic form of the GLI that is constructed as follows (Rojíček, 2010):

$$GLI = \frac{\sum_i (X_i + M_i) - \sum_i |X_i - M_i|}{\sum_i (X_i + M_i)} \tag{1}$$

Where the GLI represents the total value of intra-industry trade of the country in consideration, which is calculated as the share of the total exports from the values of exports (X) and imports (M) for the individual industries (i). If the GLI is one, there is only intra-industry trade, not inter-industry trade. This means the country in consideration exports as much of product i as it imports. Conversely, if the GLI is zero, there is no intra-industry trade, only inter-industry trade. This would mean that the country in consideration either only exports or only imports product i. The Grubel-Lloyd index for the Czech trade with China was calculated for all available two-digit codes in the Standard International Trade Classification (SITC) in the period 2001−2016 and for the services sector in the BPM6 methodology in the period 2008−2017.

The analysis of the trends in the development of the Czech-Chinese trade was carried out using data that were available from the COMTRADE and UNCTADStat database. The data about the Czech-Chinese trade were analysed and compared in the period 2001−2017. The results of the trade analysis were confronted with the gradual implementation of China's commitments in the WTO. As China's accession negotiations in the WTO covered commitments in the area of merchandise trade as well as commercial services trade, the analysis, which was carried out in this paper, covers both types of trade.

4   Results of trade analysis

In compliance with the theoretical presumption, trade liberalization contributed to the growth of bilateral trade between Czechia (CZ) and China (CN) in the period 2001−2017. However, while China's share in the total Czech exports increased by only 1.1 percentage points (pp), China's share in the total Czech imports increased by almost 10 pp. at the same time. Thus, in 2017 more than one tenth of the Czech imports came from China. While in 2005 China was in the 10th position among the main Czech trade partners, its significance gradually grew and in 2016 China was Czechia's 4th main trade partner. This was caused especially by the growth of the Czech imports from China, where China took the 2nd position behind Germany among the other countries, but on the export side China took only the 18th position (ČSÚ, 2018). On the Chinese side, the growth of the share of Czechia in the total Chinese export and import was not as significant as in the previous case, i.e. it was in the range of 0.1−0.4 % (see Table 1). In addition, while the openness of the Czech economy increased from about 122 % in 2005 to more than 151 % in 2016, the openness of the Chinese economy declined from about 62 % to 37 % during the same period (UNCTADStat, 2018).

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Although the size of a country plays an important role in the level of economic openness (Fojtíková, 2009), it is obvious that China's economic growth was followed by a growing demand, which has been satisfied more and more from domestic sources.

Table 1. Share of China/Czechia in Czech/Chinese trade in 2001 and 2017

	2001	**2017**		**2001**	**2016[1]**
Export CZ-CN (mil. USD)	80.6	2,411.3	Export CN-CZ (mil. USD)	523.8	8,058.5
Total CZ export (mil. USD)	33,384.2	180,009.9	Total CN export (mil. USD)	266,098.2	2,097,637.2
CN/CZ (%)	0.2	1.3	CZ/CN (%)	0.2	0.4
Import CZ-CN (mil. USD)	1,068.1	20,473.2	Import CN-CZ (mil. USD)	92.2	2,951.5
Total CZ import (mil. USD)	36,476.7	162,057.8	Total CN import (mil. USD)	243,552.9	1,587,920.7
CN/CZ (%)	2.9	12.6	CZ/CN (%)	0.1	0.2

[1] Data for China are available only up to 2016. Source: COMTRADE, own data processing.

The significant growth of the Czech imports from China that was not followed by the growth of the Czech exports to China at the same level resulted in the growing trade deficits of Czechia with China. The value of the Czech trade deficit with China was 18 times higher in 2017 than in 2001 and accounted for more than 18 billion USD in 2017 (see Fig. 1). Except for 2009 and 2012, the trade deficit had a growing trend. The decline of the trade deficit in 2009 was influenced by the world economic crisis: while the Czech exports to China grew, the import declined due to the lower producers' and consumers' demand. However, in 2010 the revival of the Czech economy was followed by the growth of its exports as well as imports. The best coverage ratio was recorded by Czechia in 2017 and 2013 (see Table 2).
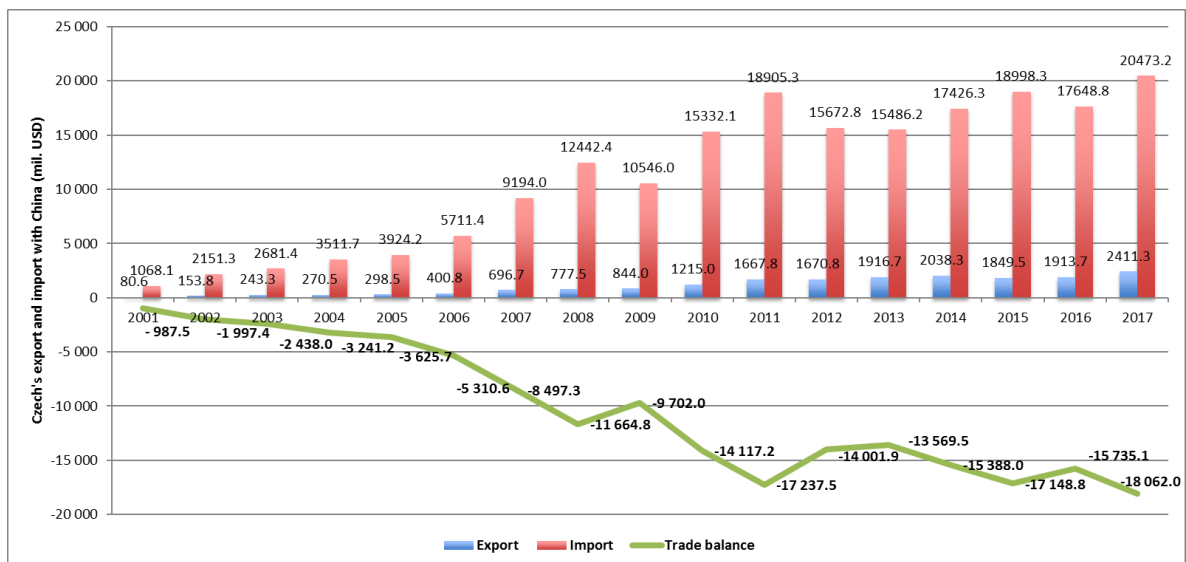

Fig. 1. Development of the Czech trade balance with China in 2001−2017 (mil. USD)
(Source: COMTRADE, own data processing)

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Table 2. Coverage ratio in 2001−2017 (%)

Year	Export (mil. USD)	Import (mil. USD)	Cover ratio (%)	Year	Export (mil. USD)	Import (mil. USD)	Cover ratio (%)
2001	80.6	1,068.1	7.5	2010	1,215.0	10,546.0	7.9
2002	153.8	2,151.3	7.2	2011	1,667.8	15,332.1	8.8
2003	243.3	2,681.4	9.1	2012	1,670.8	18,905.3	10.7
2004	270.5	3,511.7	7.7	2013	1,916.7	15,672.8	12.4
2005	298.5	3,924.2	7.6	2014	2,038.3	15,486.2	11.7
2006	400.8	5,711.4	7.0	2015	1,849.5	17,426.3	9.7
2007	696.7	9,194.0	7.6	2016	1,913.7	18,998.3	10.8
2008	777.5	12,442.4	6.2	2017	2,411.3	17,648.8	11.8
2009	844.0	10,546.0	8.0				

Source: COMTRADE, own data processing.

China's trade surpluses show the fact that although China, in principle, implemented its WTO commitments into its legal system, China was able to use the advantages of the multilateral trade system and export to the world more than Czechia. However, the aspect of the fragmentation of the production around the world fuelled by the free movement of capital has also played an important role. By 2016, the value of China's foreign direct inward stock accounted for 1,590.8 billion USD and the foreign direct investment (FDI) resulted in 31,967 foreign affiliates (FAs) that currently operate in China in comparison with only 2,832 foreign affiliates in Czechia (ITC, 2018a). The share of Czechia in China's total FDI from Europe has reached less than 1 % since 2001 (NBS, 2017). The predominant part of FAs have developed their activities in the secondary or tertiary sector in China, specifically in the following industries – Electrical and Electronic Equipment (almost 8 thousand FAs), Wholesale and Retailed Trade (more than 6 thousand FAs) and Machinery and Equipment (more than 5 thousand FAs). These enterprises, which are managed by foreign owners, produce in China and sell their production around the world, but with the label "Made in China". However, China currently not only produces and exports, but also invests in the world in compliance with the strategic government actions, such as *the One Belt One Road initiative*, which are aimed, as Baláž (2014) states, at strengthening the international position of the Chinese economy. China's SoEs multinational enterprises play an important role in this area.

Another important fact, which could play an important role in recording the Czech trade deficit with China, is the level of tariffs applied by China to its imports. China gradually lowered its MFN tariff on its bound level. This means that while in 2001 China's simple average tariff reached 15.6 %, it declined to 9.9 % in 2015 (WTO, 2017). The results of the correlation analysis also confirmed the positive relation between the growth of export and the decline of tariffs, i.e. the growth of the Czech exports to China can be explained from about 60 % by the decline of China´s import tariffs at a 5% significance level. However, in comparison with China, the simple average MFN tariff applied by Czechia and the EU reached only 5.1 %. These differences in tariff incidence in China and Czechia/EU are more visible on the sectorial level. For example, while the applied tariff on the import of motor vehicles is currently 25 % in China, the tariff that is applied on the same products in the EU is only 10 % (ITC, 2018b). As Czechia exports to China especially machinery and transport equipment (see Fig. 2), the tariff incidence in this area is more important for Czechia than China´s average MFN tariff. The high tariffs applied on the import of motor vehicles in China have motivated the producers of "Škoda Auto Volkswagen Group" to move a part of their production of cars to China and to avoid tariff barriers. Besides motor vehicles, also textiles, clothing and leather and other manufacturing are more sensitive and protected areas in China. In addition, in the EU it is possible to import more than 27 % of tariff lines duty free, but only 6.9 % of the lines of China´s Customs Tariff is duty free. Thus, from the point of view of tariffs, the Czech economy is less protected than the Chinese economy. Besides tariffs, also non-tariff measures, such as subsidization to agriculture,

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licence regimes, different technical and sanitary requirements, etc., are applied in both economies. In addition, the subsidization of SoEs in China has remained a serious problem until now (OECD, 2016), although the Chinese authorities have already announced the reform of SoEs, in which the mixed ownership of SoEs in China is preferred. In addition, some state enterprises have a monopoly to export or import some products, such as tobacco (Fojtíková, 2017). However, in some cases Czechia or the EU is the source of their own barriers to trade. For example, the minimum wage, which is considered as an important economic and social tool in the EU (Palíšková, 2016), increases the production costs and also the collective bargaining about increasing wages usually motivates the EU entrepreneurs to move their production to Asia or some low-salary countries.

In terms of the changes in the commodity structure of the Czech exports and imports from China, the group of Machinery and Transport Equipment (SITC 7) was the main tradable group in 2001 as well as 2017. It shared in the Czech exports to China by more than 60 % for the whole monitored period. Besides SITC 7, Miscellaneous Manufactured Articles and Manufactured Goods created together more than 87 % of the Czech exports to China in 2017. The share of crude materials in the Czech exports to China increased by almost 6 pp., but the share of chemicals, manufactured goods and food in the Czech exports to China declined in the range of 2−3 pp. However, these groups, except manufactured goods, created a negligible share in the total Czech exports to China (see Fig. 2).

Fig. 2. Commodity structure of the Czech exports to China in 2001 and 2017 (%)
(Source: COMTRADE, own data processing).

On the import side, Machinery and Transport Equipment, Miscellaneous Manufactured Articles and Manufactured Goods created almost 98 % of the total Czech imports from China in 2017. During the monitored period especially SITC 7 increased its share in the Czech imports from China by more than 23 pp. (from about 53 % in 2001 to more than 76 % in 2017), while the share of the other commodity groups declined (see Fig. 3). As has been stated, industries such as machinery and equipment, motor vehicles and other transport equipment, etc. are managed by FAs in China, they have new technologies and are competitive in the world markets.

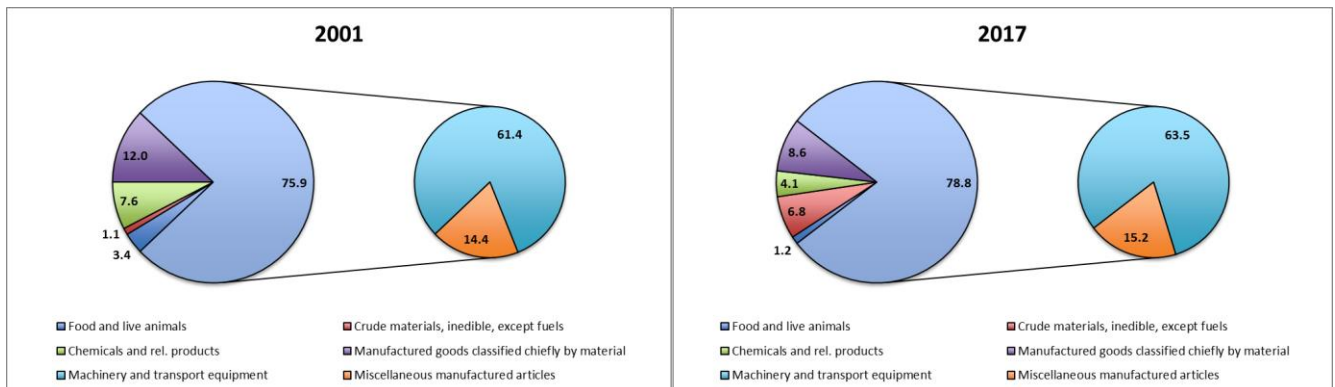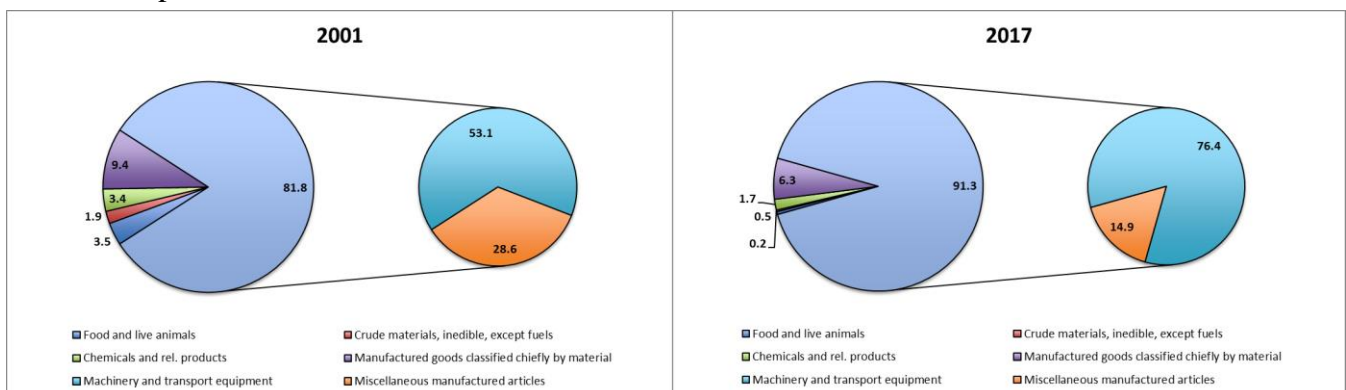**Fig. 3.** Commodity structure of the Czech imports from China in 2001 and 2017 (%)
(Source: COMTRADE, own data processing).

The significant and growing share of Machinery and Transport Equipment in the imports from China contributed to the Czech deficit with China on the most part. In 2001−2017, the trade deficit of SITC 7 increased by about 13.6 billion USD (see Table 3). A positive change in the Czech trade balance occurred in Crude Materials and Mineral Fuels, Lubricants and Related Materials. While in 2001 Czechia recorded a trade deficit in these areas, in 2017 it changed into a trade surplus. The share of these commodity groups in the total Czech imports from China declined, but their share in the total Czech exports to China increased (see Fig. 2 and Fig. 3).

Table 3. Czech trade balance with China by commodities in 2001 and 2017 (mil. USD)

	2001 (mil. USD)	2017 (mil. USD)	Change
Food and live animals	-34.22	-63.06	-28.8
Beverages and tobacco	-0.05	-1.07	-1.0
Crude materials, inedible, except fuels	-19.60	113.70	133.3
Mineral fuels, lubricants and rel. materials	-0.27	6.83	7.1
Animal and vegetable oils, fats and waxes	-0.01	-2.20	-2.2
Chemicals and rel. products	-30.39	-241.48	-211.1
Manufactured goods class. chiefly by material	-90.61	-1085.68	-995.1
Machinery and transport equipment	-517.98	-14114.16	-13,596.2
Miscellaneous manufactured articles	-294.40	-2674.75	-2,380.4

Source: COMTRADE, own data processing.

Although the main export groups of both countries in consideration are Machinery and Transport Equipment and Miscellaneous Manufactured Articles, the results of the GLI were near zero, and thus show more inter-industry than intra-industry trade (IIT) that exists between Czechia and China. The previous research of Ou and Gao (2016) also showed inter-industry trade between China and Czechia from 2000 to 2014, but the Machinery and Transport Equipment sector had a higher index of IIT. In general, according to the WTO (WTO, 2013), China's GLI against the world achieved the value of 0.40 in 2011. Despite the fact that China is considered to be a developing economy, it is more similar in structure to developed economies and thus the value of the GLI against the developed world was 0.38, while against the developing world it was only 0.36 (WTO, 2013, p. 70). The results of the GLI for the Czech-Chinese trade are recorded in Table 4. It is obvious that the Czech GLI against China was on average 0.15 for trade in goods in 2001−2016 and 0.37 for trade in services in 2008−2017. Thus, trade in services recorded a higher level of GLI than trade in goods, but both results show more inter-industry trade than IIT between Czechia and China.

Table 4. Results of the Grubel-Lloyd index

Year	GLI - goods	GLI-services	Year	GLI - goods	GLI-services
2001	0.161	-	2010	0.157	0.440
2002	0.143	-	2011	0.153	0.396
2003	0.171	-	2012	0.164	0.377
2004	0.129	-	2013	0.170	0.345
2005	0.133	-	2014	0.155	0.340
2006	0.127	-	2015	0.145	0.474
2007	0.133	-	2016	0.154	0.349
2008	0.133	0.390	2017	-	0.314
2009	0.157	0.307			

Source: own calculation.

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In 2008−2017, commercial services trade shared in the total Czech-Chinese trade by an average of five percent, but it had a growing tendency, i.e. from 4.7 % in 2008 to more than 6 % in 2017. On the export side, while in 2008 Transport dominated in the Czech exports to China, in 2017 it was Other Services that accounted for about 40 % of the total Czech services exports to China (UNCTADStat, 2018). Other Services cover, among other things, Insurance and Pension Services, Financial Services and Construction. These areas were liberalized in China later than trade in goods and generally trade in services is still protected by non-tariff measures. However, it is in compliance with China's Accession Protocol and its specific commitments on services in the WTO. On the import side, Transport shared by more than 90 % in services imports for the whole period. This services category had the highest influence on the total Czech deficit in services trade with China for the whole period (see Fig. 4).
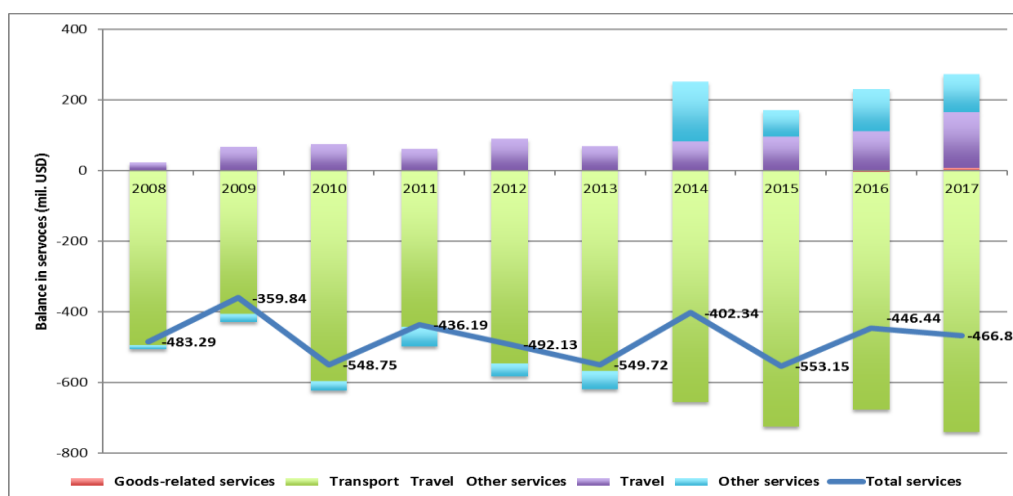
Fig. 4. Czech balance with China in services trade by category in 2008-2017 (mill. USD)

(Source: UNCTADStat, own data processing).

5   Conclusion

Although China's entrance into the WTO opened foreign companies the door to the Chinese market, and created an assumption for the support of trade with China, the standing deficit that Czechia had recorded in the trade with China in the area of goods as well as services shows that China was able to use the advantages of free trade more than Czechia. In addition, although the Czech trade structure is similar to the Chinese one, their bilateral trade is extra-industry. Thus, the original hypothesis about intra-industry trade between them was not confirmed. As the space for trade complementarity between Czechia and China is not large (Fojtíková and Vahalík, 2015), China is a significant competitor for Czechia, as China's growing position in world trade also shows. However, it is obvious that other factors, such as the growth of the Chinese economy, FDI flows, etc., also had an impact on the Chinese trade in this time. In the case of the Czech foreign trade it was also its membership in the EU and the application of a uniform trade strategy to China as well as the Common Customs Tariff and other non-tariff measures.

In the future, the Czech membership in the EU and using the Common Trade Policy against China can help Czechia to increase its export to China through Germany, which is an important trade partner for Czechia as well as China. However, the whole environment in the EU can also be changed in the future due to the reform of the EU governance (see, in more detail, Navrátil, 2018). Another change in increasing the Czech export to China could occur in services in connection with the beginning of the reform process and the opening-up of the Chinese economy in this area. On the whole, the role of the WTO on this scale is currently limited, and thus a deep liberalization between

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Czechia/EU and China could only occur after the creation of a free trade zone, which would remove tariffs and support their trade.

6 Acknowledgement

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SENIORS, LONELINESS AND THE ROLE OF MUNICIPALITIES

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Abstract
The year 2012 was declared internationally as the Year of Active Ageing. Population ageing is impacting all the world's developed countries and, in general, it is accepted that the solution to the problems surrounding ageing is to be found at the municipal rather than the central level since the former is directly involved with senior citizens. In addition to the health and economic situation of seniors, a further significant problem affecting the elderly is that of social isolation (loneliness). The aim of the article is to determine the extent of the risk of the social isolation of seniors in the Czech Republic employing data obtained from the Czech Statistical Office, studies conducted abroad and the authors' own questionnaire survey. It was concluded that the most important role of municipalities with concern to active ageing lies in the coordination of the various interested actors and organisations. Well-tuned measures exert a direct impact on improving the quality of life of both seniors themselves and the local communities in which they live as well as on the balanced development of a socially responsible society.

Keywords
Active Ageing Programmes, Municipalities, Loneliness, Senior Citizens, Social Isolation.

JEL classification
D71, H42, H75, I38

1   Introduction

Retirement usually represents a major turning point in the life of an individual which is perceived differently by every senior citizen. The senior population is often presented as a homogeneous group; however, this is not the case. Statistical data consistently confirms the relatively significant differentiation of the living conditions of the senior age cohort. Different groups have different lifestyles and priorities. The situation of seniors in the Czech Republic varies according to gender, place of residence, the amount of the pension and other socio-economic characteristics (Czech Statistical Office, 2016).

With respect to the senior population, a number of topics are currently being subjected to intensive debate, e.g. the financial situation of seniors, housing issues, health problems and the availability of health care. According to Kalvach (1986), however, it is also essential that attention be devoted to maintaining social contacts. Municipalities should work to encourage those approaching retirement to adopt an active and purposeful approach to life. It is important that older persons and seniors maintain a certain life tempo and a lively interest in their surroundings and continue to actively participate in society. Equally importantly, municipalities should work to build and encourage intergenerational connections within society.

Contact with other people is one of the most natural of human needs; indeed, according to Maslow's hierarchy of needs, contact with others makes up the third degree of the five-degree scale of basic human needs. Social isolation and loneliness are the result of not fulfilling this basic need. Confusion often arises with respect to the difference between the terms solitude and loneliness; whereas, solitude is an objective state, loneliness is a subjective emotional state. Someone who feels lonely longs for contact with other people, which is either unavailable or which occurs only very infrequently. While everyone needs to be alone from time to time, this is not a state that can be maintained over the long term without negative consequences arising.

Thus, loneliness is a "silent killer" to which insufficient attention has been devoted to date. With the increased use of social networks, it is reasonable to assume that loneliness will pose an even more

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serious problem in the future. Instead of learning how to establish new contacts in the real world, young people escape the feeling of loneliness via virtual reality or social networks. However, the rules that apply to social networks are completely different from those valid in the real world. Thus, rather than developing the ability to establish new contacts in the real world, social networks tend to further deepen the sense of isolation from society. In addition to establishing new contacts, it is necessary to be able to maintain these contacts; however, those who depend on social networks often have neither of these skills. Thus, there is a significant risk that future generations will be condemned to solitude and loneliness without the skills required to actively participate in society.

This paper aims to determine the extent of the risk of loneliness (social isolation) with respect to seniors in the Czech Republic, based on the results of which the authors provide recommendations on healthy ageing for the purposes of decision-makers. A comprehensive and systemic approach to the creation of active ageing programmes will exert a direct impact on both improving the quality of life of all local community members and the balanced development of a socially responsible society. Even though the paper is situated in the Czech Republic, the problem of aging and therefore the threat of loneliness applies to all developed countries of the world. Sharing good practice can therefore work not only within the state itself but internationally.

2   Literature review

Psychologists have warned of the dangers of solitude and particularly the involuntary form thereof, i.e. loneliness for more than half a century. However, only in recent years have studies emerged that examine the influence of loneliness on physical health. For example, research conducted by Julianne Holt-Lunstad (2017) revealed that loneliness is more deadly than obesity; indeed, loneliness was found to increase the risk of premature death by 50% compared to 30% with respect to obesity. A further example concerns a study conducted by six co-authors led by S. W. Cole (2015), which revealed similar findings, albeit with concern to different factors, i.e. that people who suffer from loneliness die earlier than those with a "healthy" level of social contact.

From the afore-mentioned, it is clear that loneliness is widespread among seniors, the main reason for which is that retirement essentially leads to the loss of albeit often involuntary work contacts and other persons connected with them (Tosnerová, 2009). Regular surveys conducted in other countries such as France (Daguet, 2017) and the United Kingdom (Beach and Bamford, 2014) have even revealed increasing levels of loneliness among younger people. This appears to present a paradox in that advances in technology have made it possible for people to be closer than at any time in human history. The fact thus remains that contact between people through technological means cannot compete with face-to-face contact. Since the ability to make and maintain contacts with others diminishes with age, it can only be concluded that the current generation of persons of economically active age will face even greater psychological and physical problems in the future than do today's seniors.

This finding is valid more for men than for women. Men tend not to change their societal role during their lifetimes to the same extent as do women. At the same time, the need for social contact is generally lower with respect to men than for women. Thus, men and women perceive loneliness in different ways. The general assertion that elderly women behave in an active and social manner as opposed to the passivity of elderly men has been confirmed elsewhere. For example, a study by Beach and Bamford (2014) asserts that in the UK when a man's partner dies, his social life shrinks to a minimum, i.e. women facilitate men's connections to the social sphere. A similar idea on men's attitudes was formulated by Tošnerová (2009); the social life of the family over time is ensured by women and it remains a female role even into old age. This does not mean that men experience a worse kind of loneliness, rather that men face a higher risk of loneliness than do women.

However, Borys and Perlman (1985) assert that although loneliness is experienced by both sexes with roughly the same frequency, women are far more likely to talk about their loneliness. Men tend to deny their loneliness, which is probably related to the fact that lonely men are less accepted and

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more socially rejected than are lonely women. At the same time, it can be stated that men tolerate loneliness to a much lower extent than do women; while lonely men are twice to three times more likely to suffer premature deaths than are men with close social ties, the corresponding risk for women is half that of men (Červený, 2001).

3   Methodology and data

As indicated in the previous chapter, with respect to the analysis of the senior population it is possible to use data obtained from the Czech Statistical Office - the Household Budget Survey, the Survey on Income and Living Conditions (EU-SILC), the international comparison of Eurostat (2017a) data and administrative data provided by municipalities. However, none of the publicly available data known to the authors was able to provide summary answers to questions related to active ageing programmes or the value attitudes of seniors. Thus, the authors conducted a special sample survey on this issue in selected municipalities as part of the TD03000156 Preferences of Seniors and the Reality of their Economic Situation in Comparison with the Activities of Municipalities within the Active Ageing Programme – Manual for the Social Departments of Selected Municipalities project.

The sample survey was conducted in the cities of Prague and Ostrava in the period May to June 2016. The quota technique was employed for the selection of respondents with the condition that it comply with the representation of the main socio-demographic groups of the population. In addition to the regional distribution, the selection process also considered the structure of the population in terms of gender and age; thus, only residents of Prague and Ostrava aged 60 to 84 were included in the sample. The collection of the data was performed via the face-to-face interview method involving trained interviewers conducting interviews with selected individuals in their homes. The research involved a total of 724 respondents (78% from Prague, 22% from Ostrava).

The sample survey was designed so as to elicit the subjective answers of seniors themselves on their perception of their leisure time and social activities, their level of engagement and overall health situation, i.e. factors that influence the degree of loneliness of seniors. The survey also addressed issues of importance both with respect to the personal lives of the respondents and for society as a whole. Finally, the survey also covered socio-demographic and economic variables.

In addition, the conclusions of the DIPEx project were employed as a complementary research resource. The project was directly oriented towards senior respondents and their life experiences such as health issues, their everyday lives, the social aspects of old age and, on a less positive level, the approach of the end of life (Social Health Institute, 2016).

3.1   Data on seniors

In 2015 the Czech Republic had a total population of just over 10.5 million inhabitants, of which those over 65 made up 17.8% of the population, i.e. 1.9 million persons (Eurostat, 2017b), a number which is set to increase substantially in the future. Moreover, population ageing is not only an issue for the Czech Republic, with the senior populations of all the EU countries having seen significant growth over the last 10 years - the old-age dependency ratio[1] increased by more than 4 percentage points on average between 2005 (25%) and 2015 (29%), see Fig. 1 (the Czech Republic compared to the EU countries). According to Eurostat forecasts (2017c), the Czech Republic will move from 15th position in this respect in 2020 to 11th position by 2050.

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[1] Old-age dependency ratio - % of the population aged 65 and over relative to the population aged 15–64 years.

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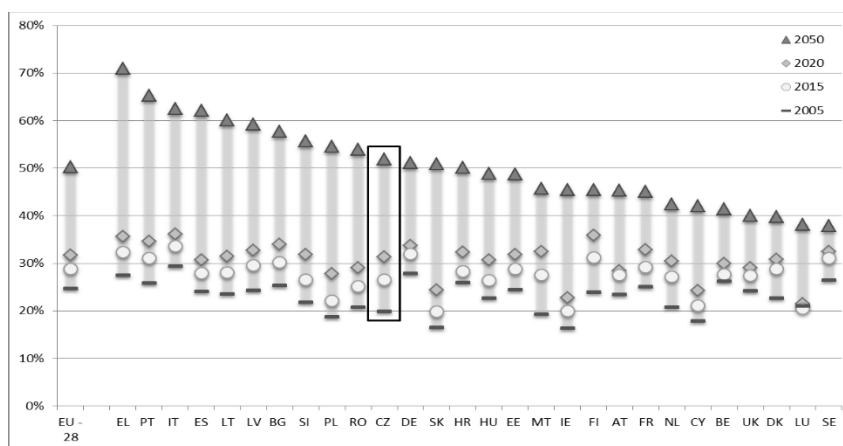
Fig.1 Old-age dependency ratio in the EU (2005, 2015, 2020, 2050)
(Source: Authors, based on Eurostat, 2017 b, c)

The prolongation of life expectancy represents one of the most important achievements of the last few decades and is the result of a fundamental improvement in health care and the raising of the overall standard of living (World Health Organisation, 2002). Ageing does not always have to be perceived with respect to its negative connotations as a burden on public systems (Sýkorová, 2006); indeed, the public should begin to perceive ageing in terms of untapped potential, a source of knowledge and experience, guardians of the nation's collective memory and a resource for filling voluntary work positions (Siegrist, Wahrendorf, 2010). It is also important to emphasise the value of seniors with respect to intergenerational relationships within both the family and the local community and their importance in the overall cultural concept of society.

In addition to the increase in the number of seniors, their economic situation also often forms a topic for expert discussion. According to international statistics (European Commission, 2015), the Czech Republic has long ranked among those countries in which the senior population is at minimum risk of income poverty, credit for which must be attributed to a functioning pension system that provides the majority of retirees with an income that exceeds the income threshold as defined by Eurostat (CZK 10 220/EUR 379 in 2015). This is particularly true if one applies the international AROP(60) indicator[2]. However, if the threshold is increased from 60% to 70% (application of the AROP(70) indicator), the proportion of seniors exposed to income poverty increases from 9.4% to 24.3% (EU-SILC data 2015). Thus, it is clear that a significant proportion of seniors live just above the internationally-defined income poverty level. The analysis of Household Budget Survey data revealed that more than 50% of total income is used by seniors to pay for essential commodities: food and non-alcoholic drinks and housing, water, energy and fuel (Beran, Godarová, 2017). Moreover, a breakdown of senior households identified one-person predominantly female households as the group most vulnerable to income poverty (AROP(60) 20.8%, AROP(70) 53.7%).

4   Seniors, loneliness and municipalities – empirical results

As mentioned in the introduction, seniors form a very heterogeneous group and, therefore, vary in terms of the need to interact with other people; moreover, their attitudes in this respect often change significantly following the death of a life partner. That said, complete isolation always exerts a destructive effect on human beings. Social isolation is not irreversible, with concern to which a number of factors play an important role, e.g. the family and the opportunity to engage in those

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[2] AROP(60) - the at-risk-of-poverty rate is the share of people with an equivalised disposable income (after social transfers) below the at-risk-of-poverty threshold which is set at 60% of the national median equivalised disposable income after social transfers. The threshold may also be set at 50% or 70%.

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activities and hobbies that allow them to enjoy the company of other people (Social Health Institute, 2016).

Table 1. Person with whom the respondent spends the most of his/her free time dependent on the presence of a partner

	Is there a partner in the household?		Total
	NO	YES	
with husband/wife	2.5%	75.2%	43.1%
with children/grandchildren	27.4%	11.2%	18.3%
with friends	31.1%	7.4%	17.9%
with neighbours	7.5%	0.5%	3.6%
alone	29.9%	5.0%	16.0%
with another person	1.6%	0.7%	1.1%
Total	100.0%	100.0%	100.0%

Source: Authors based on own sample survey (2016).

According to our survey (Tables 1 and 2), the most significant influences on who seniors spend their leisure time with are age and the presence of a partner. Seniors who live in one-person households (without a partner) stated that they spent almost 30% of their leisure time alone, which is almost 25 percentage points higher than senior households in which the respondent has a partner. No differences were detected with respect to gender, the cities selected or the presence of a household pet. A higher proportion of women respondents were found to spend time with their grandchildren.

Table 2. Person with whom the respondent spends the most of his/her free time dependent on the age of the respondent

	Age of respondent				Total
	60-64	65-69	70-74	75-79	
with husband/wife	51.7%	45.7%	36.0%	29.1%	43.1%
with children/grandchildren	17.2%	17.8%	19.9%	19.4%	18.3%
with friends	17.6%	18.7%	19.3%	14.6%	17.9%
with neighbours	1.3%	3.2%	5.0%	7.8%	3.6%
alone	11.8%	14.2%	17.4%	27.2%	16.0%
with another person	0.4%	0.5%	2.5%	1.9%	1.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Authors based on own sample survey (2016).

In addition, it is was determined that respondents with lower levels of education spend more time alone, i.e. approximately 26% versus 13.5% of tertiary educated respondents. Those potentially most at risk of loneliness and social isolation were found to be one-person households of men with a basic level of education, of whom around one third reported that they spent most of their free time alone. Nevertheless, the reported influence of the amount of the pension, which positively correlates with the education level achieved, was not found to differ significantly between the respondents.

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4.1 Recommendations for municipalities

Individuals distinguish between 7 living space zones, the closest of which are room/apartment and home and the most distant the world[3]. It is important to consider that with advancing age, a person's living space is reduced to shopping, visits to the doctor's, friends and places of remembrance, walking the dog etc. (Vidovićová et al., 2013). With age and more and more serious health issues, it becomes increasingly difficult for seniors to leave their closest living zones (home/apartment). The barriers are not only physical but also psychological such as safety concerns, the fear of falling and subsequent injury, insufficiency of open green spaces etc. If seniors are unable to leave these close zones, the risk of social isolation increases, and the resulting negative consequences are further exacerbated. The authors further state that taking the first imaginary step to escape from these zones is often the most difficult aspect for seniors.

Municipalities must consider that the non-uniformity of the local architecture renders it difficult for seniors to orientate themselves in the surroundings of their homes and living environment. Barriers to public spaces and "rapidly" changing landmarks (e.g. changes regarding local shops or the reconstruction of familiar buildings) also complicate the orientation of seniors. Thus, through their construction permission policy, municipalities are able to stimulate the orientation of and contact between people (positively and negatively)[4]. While there will always be issues that limit the potential of municipalities in this respect (funding, approval according to territorial plans, etc.), we can already see examples of good practice aimed at easing the lives of seniors. For example, the cities of Prachatice and Plzen have produced brochures that facilitate local orientation (other examples can be found on the Senior-Friendly City (Města přátelská seniorům) portal, 2017).

Municipalities can also reduce the risk of the social isolation of the elderly by offering the appropriate leisure activities or constructing community centres and senior clubs. Our survey revealed that seniors without a partner were primarily inclined towards more passive activities such as reading (63.7% of respondents), listening to the radio/watching TV (88%); interest in the public screening of films (21.8%) and lectures on health issues (20.1%) compared to respondents with a partner who, in addition to these pastimes, also mentioned more physically demanding activities such as gardening (43.7%), maintaining the country cottage (34.6%); interest in tourist tours (26.2%), group visits to art galleries, theatres or concerts (21.4%), visits to spa facilities (19.7%) and swimming (19.4%). A strong inclination towards passive activities, which are often conducted at home, may further exacerbate social isolation.

Municipalities should, therefore, focus on activating these seniors through gradual steps building upon their existing hobbies such as establishing readers' clubs and so-called "chatter and natter" spaces. Assistance might also be enhanced through cooperation with organisations that provide leisure activities or local businesses such as cafes and restaurants. The results of our survey of seniors in Prague and Ostrava revealed the very low frequency of membership of such organisations, which have real potential for reducing the risk of social isolation. However, the survey results also showed that approximately one-third (32.5%) of respondents are not interested in participating in any type of leisure activity (a more detailed breakdown of this indicator is provided in Table 3). However, the format of the survey did not allow for the identification of the reasons for their lack of interest. This high level of disinterest represents a "wake-up call" for municipalities to focus more on identifying the causes and helping to eliminate involuntary solitude and the problems and barriers faced by seniors.

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[3] The 7 living space zones - room, home, home surroundings, neighbourhood, community/field of action, wider surroundings, world.

[4] This does not concern only the barrier-free reconstruction of theatres, social and public institutions and municipal offices, the reconstruction of pavements with access ramps, repairs to public transport stops, etc. but also the creation of new spaces: cycling routes that are also suitable for electric bicycles and scooters, parks and public spaces that take into account the needs of seniors: benches, active recreation areas (petanque, bowling and chess facilities) and nordic walking routes.

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Table 3. Not interested in leisure activities according to selected criteria

gender		household composition	
male	40.9%	1-person household	37.7%
female	25.6%	2-person household	31.8%
place of residence		3+ person household	17.6%
Prague	34.9%	amount of pension	
Ostrava	23.7%	less than CZK 7 000	19.0%
education		CZK 7 000 – 9 000	32.5%
basic	44.2%	CZK 9 000 – 11 000	28.6%
apprenticeship	34.9%	CZK 11 000 – 13 000	32.6%
secondary	30.2%	more than CZK 13 000	45.4%
tertiary	23.1%		
Total		32.5%	

Source: Authors based on own sample survey (2016).

Municipalities are able to influence the perception of the elderly population through the provision of intergenerational activities and projects which will act to break down the various barriers perceived by seniors. According to our survey, seniors are discouraged from interacting with younger people for the following reasons:

- I do not identify with their lifestyle and life values - 32.9% (men 36.9%, women 29.6%);

- I do not think that we have any common interests/hobbies - 31.9% (men 33.8%, women 30.3%)

- I do not feel that younger age groups are interested in me - 28.9% (men 28.9%, women 28.8%),

With respect to social interaction, the overwhelming majority of seniors prefer interaction with people of the same age. A higher incidence of willingness to interact with young people was expressed by those respondents with grandchildren (35.7% versus 20.9% of those with no grandchildren).

5   Conclusion

The aim of healthy ageing programmes provided by public administration authorities should be to ensure the prolongation of an active life, in accordance with the values and way of life of seniors and in their natural and familiar surroundings. According to the principle of subsidiarity, such programmes are delegated to the municipality level in the Czech Republic. It is important to remember that, with the passage of time, senior issues and problems associated with an ageing population will require ever increasing attention; this issue simply cannot be ignored and all the Member States of the EU, including the Czech Republic, must make the appropriate preparations.

The outputs of the paper are based on both statistical data obtained from the Czech Statistical Office and a representative sample survey conducted in 2016 under the auspices of the Research Institute for Labour and Social Affairs. The survey recorded both the perception of leisure time and the content thereof and those values perceived as important both in terms of the personal lives of the respondents and society as a whole. The results of the survey provided a unique opportunity to examine this issue from the viewpoint of seniors themselves.

It is already recommended that those who will retire in the next few years prepare both financially and socially for this important life step. Our survey shows that the most potentially endangered by the involuntary solitude are those of lower education (men in a greater extent), and the risk increases

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with increasing age when two-member households become single-member households. On the other hand, the positive influence can bring intergenerational activities and close ties to the grandchildren. Seniors who experience involuntary solitude are unable to help themselves to escape from this situation. Solitude quickly becomes a feeling of unbearable loneliness accompanied by boredom and sadness. A failure to tackle loneliness often results in passivity, resignation, the inability to comprehend one's surroundings and, consequently, depression, the deepening of the feeling of exclusion, and loneliness that may even lead to suicide. Social isolation can be remedied through the efforts of social workers at the municipality level that raise awareness among seniors and that break down the barriers that they perceive and that prevent them from engaging in activities organised by the municipality and non-profit organisations. However, the most important role for municipalities consists of the coordination of active ageing issues, the activation of seniors to become involved and facilitating their interconnection with the local community.

Municipalities should not fall into the trap of creating active ageing programmes that stereotype or adhere to the myths that surround old age. While municipalities may provide a wide range of services and events for their citizens, it does not necessarily mean that they satisfy the needs of the senior risk group. Our survey shows that about one third of respondents are not interested in participating in any leisure activities in the municipality. However, the format of the survey unfortunately does not reveal the cause of their lack of interest. Programmes should be aimed at developing leisure activities specifically for the elderly. The social interaction of seniors requires the provision of activities other than those that are purely family based, i.e. babysitting grandchildren and looking after a pet, etc.

The implementation of intergenerational projects is also important in this context, e.g. cultural and sports programmes designed to involve nursery and primary schools and homes for the elderly and senior clubs. Younger generations could be provided with demonstrations of the skills of retired craftsmen/women (lace-making, machining, knitting, carving, joinery, etc.) including the opportunity for young persons to learn these skills. Public authorities should actively share good practice including, for example, information available on the National Network of Healthy Cities of the Czech Republic (Národní sítě zdravých měst ČR) (2017) or Senior-Friendly City (Města přátelská seniorům) (2017) etc. websites. Municipalities use methodology of World Health Organisation (2007), which promotes a positive view of the senior population.

6   Acknowledgement

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Appendix

Breakdown of respondents according to household and gender

	Gender of respondent		Total
	Male	Female	
1-person household	29.8%	46.9%	39.2%
2-person household	57.8%	41.9%	49.0%
3+ person household	12.3%	11.3%	11.7%
Total	100.0%	100.0%	100.0%

Source: Authors based on own sample survey (2016).

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TRANSMISSION OF INTEREST RATES: THE CASE OF THE CZECH REPUBLIC

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Abstract
The paper examines the interest rate pass-through in the Czech Republic. Specifically, I focus on the pass-through from the main monetary policy rate to consumer, mortgage, SME and corporate lending rates in period from January 2004 to September 2016. The empirical literature suggests that the pass-through varies across countries and across type of loans. After the global financial crisis, however, researchers mostly confirm a lesser pass-through. The goal of this paper is to find out whether spill-over effects of the global financial crisis have somehow influenced the interest rate pass-through in the Czech Republic. In addition, I test the role of credit risk and government bond yields in the setting of lending rates. To do so, I employ the Autoregressive Distributed Lag (ARDL) modelling approach. The baseline results suggest that the interest rate pass-through is complete for all lending rates. Those results, however, neglect the effect of the global financial crisis. In order to address this concern, I create a shift crisis dummy variable. The results of the model with the crisis dummy variable show that after the crisis, the efficiency of the pass-through significantly dropped for mortgage and SME lending rates but not for corporate lending rates, for which the pass-through remained complete.

Keywords
ARDL model, Global financial crisis, Interest rate pass-through, Monetary policy rate.

JEL classification
E43, E52, C22

1   Introduction

In recent years, there have been hold serious discussions about the efficiency of monetary policy transmission mechanisms. After the global financial crisis, monetary policy authorities in the EU lowered the main monetary policy rate in order to stimulate the economy. However, even 'zero' policy rate did not lead to the recovery, and the EU countries still faced to the threat of deflation. Therefore, the European Central Bank (ECB) decided to use an unconventionally monetary policy tool in form of quantitative easing. The Czech National Bank reacted similarly using the interventions on the foreign exchange (FX) market. According to Lízal and Schwarz (2013), quantitative easing through FX interventions works highly efficiently for small open economies such as the Czech Republic.

The use of unconventional monetary policy may imply to a reduced efficiency of traditional tools of monetary policy in the post-crisis environment. Thus, the goal of the paper is to find out whether spillover effects of the global financial crisis have somehow influenced the transmission of interest rates in the Czech Republic. In addition, I test whether the credit risk and government bonds as an alternative form of lending affects the transmission process.

The literature focusing on the interest rate pass-through shows that the size of the pass-through varies across the EU countries an across type of loans (Hofmann, 2006; Sorensen and Werner, 2006; Égert, Crespo-Cuaresma and Reininger, 2007; Van Leuvensteijn, Sorensen, Bikker and van Rixtel, 2008; Belke, Beckmann and Verheyen, 2012; Holton and d'Acri, 2015; Gambacorta, Illes and Lombardi, 2015). After the global financial crisis, however, researchers mostly confirm a weaker transmission of interest rates. For instance, Hristov, Hülsewig and Wollmershäuser (2014) using the VAR and DSGE models find a substantially lower interest rate pass-through in the post-crisis period. The same result is confirmed by Gambacorta, Illes, and Lombardi (2015), who examine the long-run relationship between the money market rate and bank lending rates in Italy, Spain, the UK and US. They argue that the lower size of the pass-through is caused mainly due to the higher uncertainty and higher perception of risk.

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For the analysis of the interest rate pass-through in the Czech Republic, I use the ARDL modelling approach. The sample starts in January 2004 and ends in September 2016. For the estimation, I use two different models. First, I examine the size of the pass-through from the main monetary policy rate to banks' lending rates including the credit risk and spread between government bonds rate and the policy rate. Second, I employ an extended model with an interaction post-crisis dummy variable to control for a possibility of structural breaks.

Results suggest that the interest rates pass-through is weaker after the global financial crisis for mortgage and SME lending rates but not for corporate lending rates. Moreover, I find that the credit risk substantially affects the corporate lending rates, which shows that banks charge a higher risk premium on corporate lending rates to cover for possible losses.

The rest of the paper is organized as follows: Section 2 includes data and model description. Section 3 shows the results of the estimation, and finally, section 4 concludes.

2   Methods and Data

Data for the research are obtained from the Czech National Bank's ARAD database in monthly frequency. The sample starts in January 2004 and ends in September 2016. I use four different lending rates as the dependent variable, namely: consumer lending rates, mortgage lending rates, small corporate lending rates (SME) and large corporate lending rates. Table 1 shows the description of lending rates.

Table 1. Banks' interest rates

Consumer lending rates (LRCONS)	Aggregated bank interest rate on consumer credit
Mortgage lending rates (LRMORT)	Aggregated bank interest rate on loans granted to households for house purchase
Small corporate loans lending rates (LRSME)	Aggregated bank interest rate on loans up to 30 million CZK granted to non-financial corporations.
Large corporate loans lending rates (LRCORP)	Aggregated bank interest rate on loans over 30 million CZK granted to non-financial corporations.

Source: Czech National Bank.

As a reference rate, I use the two-week repurchase rate (repo rate) set by the Czech National Bank. Although the literature prefer to use a money market rate instead of monetary policy rate as a reference rate, the use of the repo rate allows me to determine the direct impact of a shift in the monetary policy rate on banks' lending rates. In addition, the money market based approach assumes a fixed relationship between the monetary policy rate and the money market rate. After the global financial crisis, however, the relationship could have been disturbed. Therefore, I use following specification of the interest rate pass-through:

$$banks\ lending\ rate = \alpha + \beta repo\ rate + error\ term, \tag{1}$$

where α represents the mark up between rates and β shows the size of the interest rate pass-through. If β equals to one, then the interest rate pass-through is complete, which means that banks fully adjust their lending rates. Figure 1 shows the relationship between the repo rate and banks' lending rates.
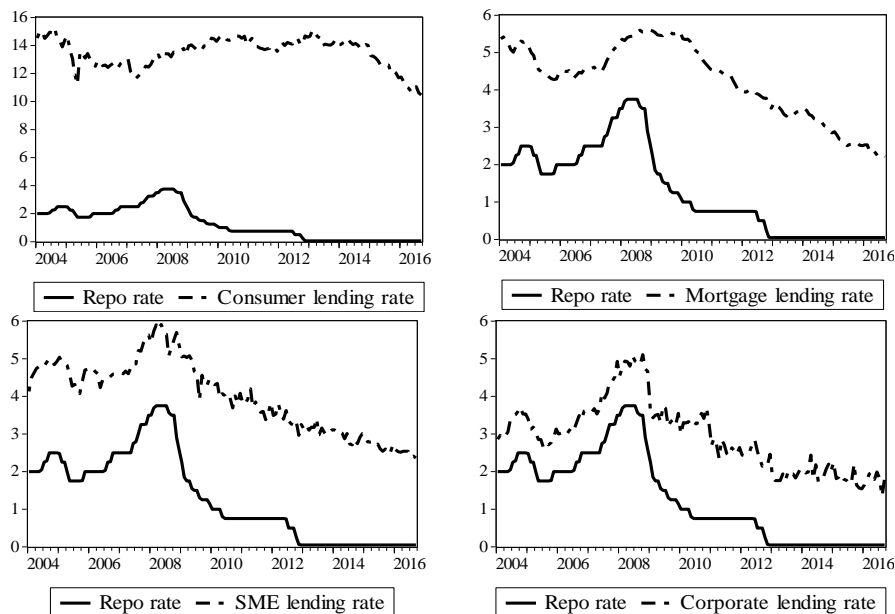
Figure 1. Repo rate against banks' lending rates (Source: Czech National Bank).

To capture other effects, which may play a significant role in the setting of lending rates, I extend the theoretical equation (1) in the following form:

$$banks\ lending\ rate_t = \alpha + \beta repo\ rate_t + \gamma X_t + error\ term_t, \tag{2}$$

where vector X_t covers factors such as credit risk and government bonds as the alternative return from investing.

The credit risk has two sides. First, there is a borrowers' credit risk, which can be measured by the ratio of non-performing loans to total loans (*NPLR*). I collect the *NPLR* for each segment of loans: non-financial corporate loans[1], consumer loans and mortgages. Second, there is a credit risk on the side of banks, which is connected to banks' balance sheet. Several indicators can be used to measure this effect. The most appropriate seems to be a credit default swaps (CDS). Nevertheless, the date of CDS are not available for this research. As an alternative, one can use indicators such as the bank Z-Score published by the World Bank, which measures stability of banks, or indicators based on the bank balance sheet. Unfortunately, the Z-Score time series are not available in monthly frequency, which excludes their use. Thus, to capture the credit risk on the side of banks, I use simple ratio of banks capital to total banks assets (*CAPTOASSETS*). It should provide a basic information about the condition of banks.

The government bonds serve as an alternative asset to loans, which may shift a bank decision from commercial lending to government lending, especially in the post GFC period. The alternative return from investing in government bonds is reflected by the spread between the government bond rate and the repo rate. It captures the impact of fiscal policy and time varying sovereign risks. In addition, government bonds rate reflects the expectations about the future path of short-term rates, which further affects the setting of long-term lending rates (Hofmann and Mizen, 2004).

Figure 2 shows the repo rate against the *NPLR*, capital to assets ratio, and the spread between government bonds rate and the repo rate. Table A1 in the appendix provides the summary statistics of those variables.

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[1] The ratio of non–performing loans for non-financial corporations serves as the measure of a credit risk for small corporate loans as well as for large corporate loans.
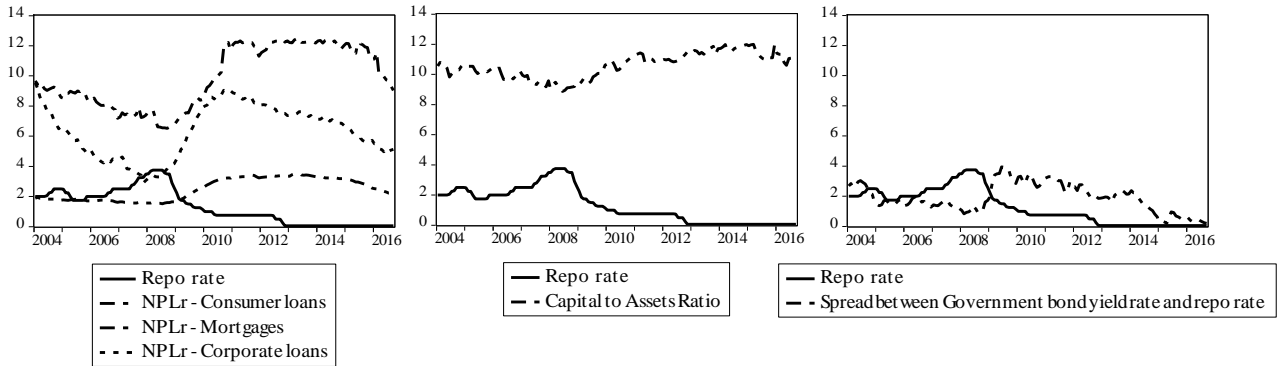
Figure 2. Repo rate against NPLR, Capital to Assets ratio and Spread between G-bond rate and Repo rate (Source: Czech National Bank).

2.1   Model

For the estimation of the interest rate-pass through, I use the Autoregressive Distributed Lag (ARDL) model developed by Pesaran and Shin (1999) and further extended by Pesaran, Shin and Smith. (2001). The ARDL model allows using a stationary time series I(0) as well as first order integrated time series I(1). However, the use of second order integrated time series I(2) is not recommended. Moreover, thanks to the ARDL model, one can distinguish between the long-run co-integration relationship effect and short-run dynamic effect.

The long run co-integration relationship is defined as:

$$lr_t = \alpha_0 + \alpha_1 trend_t + \beta_1 repo_t + \gamma_1 nplr_t + \gamma_2 captoassets_t + \gamma_3 spread_t + u_t, \quad (3)$$

where lr is a banks' lending rate, α_0 is a constant, which represents the long term mark up between the repo rate and the individual lending rate, α_1 is the coefficient of time trend ($trend$), $repo_t$ is the repo rate and β_1 represents the coefficient of long-run pass-through. Further, $nplr_t$ is the ratio of non-performing loans, $captoassets_t$ is the ratio of banks capital to total banks assets, and $spread_t$ is the spread between the government bond rate and the repo rate. Finally, u_t is the error term.

For the estimation of the ARDL model, it is necessary to choose an appropriate lag length structure. For this purpose, I use the Schwarz information criterion. Nevertheless, to simplify the model description, I now assume the ARDL (1,0,0,0,0) model written as:

$$lr_t = \delta_0 + \delta_1 trend_t + \omega_1 repo_t + \mu_1 nplr_t + \mu_2 captoassets_t + \mu_3 spread_t + \varphi y_{t-1} + \varepsilon_t. \quad (4)$$

The equation (4) can be rewritten in form of error correction model (ECM):

$$\Delta lr_t = \omega_1 \Delta repo_t + \mu_1 \Delta nplr_t + \mu_2 \Delta captoassets_t + \mu_3 \Delta spread_t$$
$$- \theta(lr_{t-1} - \alpha_0 - \alpha_1 trend_{t-1} - \beta_1 repo_{t-1} - \gamma_1 nplr_{t-1} \quad (5)$$
$$- \gamma_2 captoastsr_{t-1} - \gamma_3 spread_t) + \varepsilon_t,$$

where

$$\theta = 1 - \varphi, \alpha_0 = \frac{\delta_0}{1-\varphi}, \alpha_1 = \frac{\delta_1}{1-\varphi}, \beta_1 = \frac{\omega_1}{1-\varphi}, \gamma_1 = \frac{\mu_1}{1-\varphi}, \gamma_2 = \frac{\mu_2}{1-\varphi}, \gamma_3 = \frac{\mu_3}{1-\varphi}.$$

The ECM equation shows the short-run dynamics (terms with delta symbol) as well as long-run relationship (terms in parenthesis). In addition, the parameter θ represents the speed of adjustment, which shows the responsiveness of lending rates to a shock from the long-run equilibrium.

The ADF and PP unit root tests confirm mostly non-stationarity of time series (see Appendix, Table A2). The exception seems to be the lending rate for mortgages (*LRMORT*) and ratio of non-performing loans for the corporate loans segment (*NPLRNFC*). Zivot-Andrew test, which accounts for a structural break in the time series, confirms the same results (see Appendix, Table A3). As I stated before, the advantage of the ARDL modelling approach is the possibility of using stationary as well as non-stationary time series. Nevertheless, it is necessary to check the existence of the long run co-integration relationship. For this purpose, I use the Engle-Granger and Phillips-Ouliaris co-integration test. Both tests assume first order integrated time series, which might be in some cases problematic. Thus, I also apply the ARDL Bound test. The Bound test compares the value of estimated F-statistic with the border critical value for I(0) and I(1) time series provided by Pesaran, Shin and Smith (2001). One can confirm a long-run co-integration relationship if the value of estimated F-statistic is higher than the upper bound value.

3   Results and Discussion

As a first step, I check the existence of the co-integration relationship between the individual bank lending rate and the repo rate, using the Engle-Granger and Phillips-Ouliaris test. Table 2 provides the results of both tests.

Table 2. Co-integration tests[2]

	Engle-Granger		Phillips-Ouliaris	
	Prob. (tau-stat)	Prob. (z-stat)	Prob. (tau-stat)	Prob. (z-stat)
Consumer lending rate and repo rate	0.8548	0.7095	0.9960	0.9966
Mortgage lending rate and repo rate	0.8063	0.6662	0.2663	0.4860
SME lending rate and repo rate	0.3711	0.2066	0.0028	0.0089
Corporate lending rate and repo rate	0.1854	0.1428	0.0012	0.0013

Source: Czech National Bank.

For all lending rates, the Engle-Granger test fails to reject the null hypothesis that series are not co-integrated. The Phillips-Ouliaris test, however, confirms the existence of the long-run co-integration relationship for the SME and corporate lending rates but not for the consumer and mortgage rates. The Phillips-Ouliaris co-integration test lies on the assumption of the first-order integrated time series. Since the mortgage lending rates series is stationary in level (see Table A2 and A3 in the appendix), the result of the co-integration test might be biased. Nevertheless, as I mentioned in the previous section, the ARDL modelling approach allows using the stationary as well as first order integrated time series. In such a situation, the long-run co-integration relationship between I(0) and I(1) time series can be verify by the ARDL Bound test.

I begin the estimation of the interest rate pass-through with the baseline model specified by equation 5. The results show significantly high interest rate pass-through in the long-run for all lending rates except the consumer one. The pass-through coefficient is almost one for mortgages, SME and corporate lending rates, which implies to a complete long-run pass-through. For consumer lending rates, however, the value of the ARDL bound test falls in the indeterminate region suggesting an inconclusive long-run co-integration relationship. Thus, I reject the existence of the co-integration

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[2] For detailed description of the cointegration tests see Engle and Granger (1987), and Phillips and Ouliaris (1990).

relationship between the consumer lending rate and the repo rate. Apparently, commercial banks set their consumer lending rates according to different criterions than the repo rate.

The short-run effect of the pass-through seems to be much weaker in compare to the long-run, especially in case of the SME and mortgage lending rate. For corporate lending rate, however, the short-run pass-through is significantly high (0.88). Therefore, to keep large customers, banks tend to adjust the corporate lending rate almost completely right in the short-run. The speed of adjustment toward the long-run equilibrium is the highest for the SME lending rate. The corporate lending rate are adjusted a bit slower and the mortgage rate by far the slowest.

The delinquency rate (*NPLR*) significantly increases the risk premium over the corporate rate. Therefore, banks secure themselves against potential losses by adding the risk premium to the price of corporate loans. The capital position of banks (*CAPTOASSETS*) affects the SME lending rates. The causality, however, is counterintuitive because the positive relationship implies that less leveraged banks increase the lending rate for small and medium enterprises. This might be associated with the higher capital requirement proposed by Basel Committee on Banking Supervision (Basel III). Banks, facing to higher capital requirements, might reduce the supply of loans and thus increase the price of loans.

The spread between the government bond rate and the repo rate significantly affects the mortgage and SME lending rates. It means that banks rather invest in risk free government bonds than in the mortgage or SME loans, which reflects the crowding out effect.

Table 3. The interest rate pass-through: Baseline model

Dependent Variable	CONS	MORT	SME	CORP
Long-run relationship				
REPO	0.2405	0.9611***	0.9958***	1.0368***
	(0.5391)	(0.1485)	(0.0636)	(0.1133)
NPLR	0.4135	-0.2468	-0.0143	0.1561**
	(0.2474)	(0.2007)	(0.0420)	(0.0625)
CAPTOASSETS	-0.8388	-0.0496	0.3065***	-0.2980*
	(1.1415)	(0.1710)	(0.1060)	(0.1658)
SPREAD	1.0532***	0.7656***	0.2727***	0.1216
	(0.3112)	(0.0967)	(0.0586)	(0.0932)
CONSTANT	15.7261	1.8001	-0.9884	2.7436
	(10.8606)	(1.9514)	(1.1168)	(1.8053)
TREND		0.0093***		0.0102***
		(0.0034)		(0.0016)
SPEED OF ADJ.	-0.1167	-0.1014***	-0.4512***	-0.3559***
	(0.0748)	(0.0164)	(0.0576)	(0.0990)
Short-run dynamics				
ΔLR (-1)		0.1381*	-0.2015***	-0.2104**
		(0.0751)	(0.0663)	(0.0853)
ΔREPO	0.0281	0.0975***	0.4493***	0.8828***
	(0.0723)	(0.0183)	(0.0500)	(0.1717)
ΔNPLR	0.0483	-0.0250	-0.0064	0.0555**
	(0.0327)	(0.0197)	(0.0189)	(0.0221)
ΔCAPTOASSETS	-0.0979	-0.0050	0.1383***	-0.1060*
	(0.1012)	(0.0174)	(0.0435)	(0.0577)
ΔSPREAD	-0.2016	0.0095	0.3126***	0.0433
	(0.1260)	(0.0243)	(0.0615)	(0.0369)
Num. Of obs.	152	151	151	151
ARDL Bounds Test	2.8702	11.686	9.9645	5.3310
[Crit. value for 5 % sig.]	[2.86-4.01]	[3.47-4.57]	[2.86-4.01]	[3.47-4.57]
Heteroscedasticity correction	WHITE			WHITE

Notes: ***, **, * - shows statistical significance at the 1%, 5%, and 10%. The sample covers period from January 2004 to September 2016. The lag length structure is chosen according to the Schwarz Criterion (SC) while the maximum lag length is set at twelve lags. We include the linear trend into the equation only if it is statistically significant. Values in parentheses show standard errors and values in brackets are critical values for the ARDL Bound test. Term WHITE means that I used the White covariance matrix to deal with an observed heteroscedasticity in the model.

Source: Czech National Bank.

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To test the possibility of a structural break caused by the spillover effects of the global financial crisis, I include an interaction post-crisis shift dummy (D^s) into the model. The dummy variable takes value of 0 before the crisis (from 2004M01 to 2008M08) and value of 1 thereafter. The extended model of the long-run cointegration relationship with the shift dummy variable is defined as:

$$lr_t = \alpha_0 + \alpha_1 trend_t + \beta_1 repo_t + \gamma_1 nplr_t + \gamma_2 captoassets_t \\ + \gamma_3 spread_t + \psi_1 D_t^S \cdot repo_t + \chi_1 D_t^S \cdot nplr_t + \chi_2 D_t^S \cdot captoassets_t \\ + \chi_3 D_t^S \cdot spread_t + u_t,$$

(6)

where the total post-crisis effect is computed as a sum of the variable with and without the crisis dummy (e.g. total post-crisis effect of the repo rate $= \beta_1 + \psi_1$). For the estimation of the extended model, I use the ARDL modelling approach. The results are shown in table 4.

The ARDL bounds test again rejects the co-integration relationship for the consumer lending rate, which suggests that consumer lending rates are independent on monetary policy rate in the long run. For mortgage and SME lending rates, the size of the pass-through significantly dropped. Therefore, in the post-2008 period, commercial banks responded on the changes in the repo rate only in limited extend considering the mortgage and SME lending rates. In contrast, the pass-through to corporate lending rates remained complete even after the crisis.

Interestingly, the estimated parameter of the speed of adjustment is higher with the inclusion of the interaction shift dummy variable. Thus, banks react faster on the shock from the long-term equilibrium.

The capital to assets ratio plays a significant role only for SME lending rates, which confirms the results of the baseline model. The credit risk, in form of the non-performing loans ratio, affects only the corporate lending rates. Apparently, after the crisis, banks increased the prices of corporate loans by the risk premium to cover for possible losses. Interestingly, the model also captures a significant negative impact of *NPLR* on SME lending rates in the pre-crisis period. It demonstrates that before 2008, banks underestimated the credit risk and charged lower rates on riskier SME loans. The spread between the government bond rate and the repo rate become insignificant with the inclusion of the interaction dummy for all lending rates. Therefore, the post-crisis activity of the government sector did not affect the commercial banks' lending rates.

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Table 4. The interest rate pass-through: Model with the post-crisis dummy

Dependent Variable	CONS	MORT	SME	CORP
Long-run relationship				
REPO	1.4540***	0.9627***	0.9391***	1.0451***
	(0.4436)	(0.0789)	(0.0518)	(0.0878)
NPLR	-0.0542	-0.8178	-0.0798**	-0.0517
	(0.7167)	(0.7895)	(0.0353)	(0.0634)
CAPTOASSETS	-0.7273	-0.2241	0.0292	-0.1644
	(0.5499)	(0.1394)	(0.0720)	(0.1060)
SPREAD	0.3102	0.2217	-0.0278	0.2319
	(0.8537)	(0.1396)	(0.0726)	(0.1544)
D^S*REPO	-2.6919***	-0.8130***	-0.4804***	-0.1023
	(0.6080)	(0.1908)	(0.1109)	(0.0954)
D^S*NPLR	0.2935	0.4479	-0.0293	0.2267***
	(0.7324)	(0.7942)	(0.0456)	(0.0744)
D^S*CAPTOASSETS	0.9593**	0.2592*	0.2198***	0.0095
	(0.4695)	(0.1426)	(0.0465)	(0.0411)
D^S*SPREAD	-0.7866	0.0766	0.0902	-0.2731*
	(0.7704)	(0.1139)	(0.0882)	(0.1599)
CONSTANT	19.0055***	6.3488***	3.2691***	2.5040**
	(4.8007)	(1.2352)	(0.8249)	(1.0654)
TREND	-0.0853***	-0.0245***	-0.0207***	
	(0.0174)	(0.0068)	(0.0032)	
SPEED OF ADJ.	-0.2687**	-0.2103***	-0.7465***	-0.5990***
	(0.1309)	(0.0418)	(0.0787)	(0.0683)
Short-run dynamics				
ΔLR (-1)		0.1626**		
		(0.0726)		
ΔREPO	0.3906***	0.2025***	0.7010***	0.6260***
	(0.1392)	(0.0416)	(0.0747)	(0.0853)
ΔNPLRC	-0.0146	-0.1720	-0.0596**	-0.0310
	(0.1875)	(0.1741)	(0.0267)	(0.0374)
ΔCAPTOASSETS	-0.1954	-0.0471	0.0218	-0.0985
	(0.2023)	(0.0312)	(0.0529)	(0.0647)
ΔSPREAD	0.0833	-0.0297	0.1830**	0.1389
	(0.2013)	(0.0334)	(0.0804)	(0.0896)
Δ(D^S*REPO)	-0.7232**	-0.1710***	-0.3586***	-0.0613
	(0.3140)	(0.0634)	(0.0959)	(0.0568)
Δ(D^S*NPLR)	0.0789	0.0942	-0.0219	0.1358***
	(0.1706)	(0.1708)	(0.0344)	(0.0438)
Δ(D^S*CAPTOASSETS)	0.2577	0.0545	0.1641***	0.0057
	(0.2212)	(0.0334)	(0.0411)	(0.0246)
Δ(D^S*SPREAD)	-0.2113	0.0161	0.0674	-0.1636*
	(0.1494)	(0.0239)	(0.0675)	(0.0924)
Num. Of obs.	152	151	152	152
ARDL Bounds Test	2.2469	7.8500	11.900	7.4032
	[2.55-3.68]	[2.55-3.68]	[2.55-3.68]	[2.22-3.39]
Heteroscedasticity correction	WHITE	WHITE	WHITE	

Notes: ***, **, * - shows statistical significance at the 1%, 5%, and 10%. The sample covers period from January 2004 to September 2016. The lag length structure is chosen according to the Schwarz Criterion (SC) while the maximum lag length is set at three lags. We include the linear trend into the equation only if it is statistically significant. Values in parentheses show standard errors and values in brackets are critical values for the ARDL Bound test. Term WHITE means that I used the White covariance matrix to deal with an observed heteroscedasticity in the model.

Source: Czech National Bank.

4   Conclusion

In this paper, I examine the interest rate pass-through in the Czech Republic using the ARDL modelling approach. The goal of the paper is to find out, whether spillover effects of the global financial crisis influence the interest rate pass-through in the Czech Republic. Moreover, I analyze the effect of the credit risk and government bonds on the pass-through process.

I can summarize the conclusion in four steps. First, the interest rate pass-through has weakened since the outburst of the global financial crisis for the mortgage and SME lending rate. For the corporate lending rate, the interest rate pass-through has remained complete even after the crisis. This result contradict the earlier assessment by Havránek, Iršová and Lešanovská (2016). They find the evidence of a weaker interest rate pass-through for corporate loans after the onset of the GFC. Nevertheless, I cover much longer period in compare to their sample. Presumably, the corporate lending rate pass-through temporarily dropped after the crisis but recovered to the complete level thereafter. Further, I could not confirm any significant long-run relationship between the consumer lending rate and the main monetary policy rate. It suggests that banks set the consumer lending rates independently from the monetary policy stance.

Second, the credit risk, measured as the ratio of non-performing loans to total loans, increases the mark up between the monetary policy rate and the corporate lending rate. The effect is even more pronounced in the post-crisis period. This is in line with the results of the studies by Hristov, Hülsewig and Wollmershäuser (2014) and Gambacorta, Illes, and Lombardi (2015). Apparently, after the crisis, banks increased the corporate lending rates by a risk premium to cover for expected losses. On the other hand, before the crisis, there is an opposite effect of the credit risk on SME lending rates. Therefore, banks tended to charge lower rates on riskier SME loans. It shows possible underestimating of the risk in the pre-crisis period.

Third, I conclude that less leveraged banks charge higher rates on the SME loans. The effect is more pronounced after the crisis. The explanation might be associated with the regulatory requirements of the macroprudential policy (e.g. the systematic risk buffer, the capital conservation buffer and the countercyclical buffer). The willingness of banks to grant new loans is reduced in faced of higher capital requirements, which is reflected by higher prices of loans.

Finally, the spread between the government bond yield rate and the repo rate largely affects the mortgage and SME lending rates. The effect, however, is not robust. It disappears with the inclusion of the interaction dummy variable.

To summarize, the central bank may expect an effective pricing of loans in the corporate loan segment but less effective in case of the consumer, mortgage and SME loan segment. Therefore, to achieve a desirable increase or decrease of the consumer, mortgage and SME lending rates, the central bank should consider implementing other accompanying measures such as the loan to value (LTV) ratio, debt-to-income (DTI) ratio, or debt service to income (DSTI) ratio.

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Appendix

Table A1 – Summary Statistics of Used Variables

	LR CONS	LR MORT	LR SME	LR CORP	REPO	NPLR CONS	NPLR MORT	NPLR NFC	CAPTO ASSETS	GBY spread
Mean	13.50	4.25	3.99	2.92	1.30	9.93	2.48	6.33	10.61	1.91
Median	13.79	4.47	4.07	2.88	0.80	9.54	2.46	6.63	10.69	1.85
Max.	15.23	5.60	5.91	5.11	3.75	12.52	3.48	9.66	12.00	3.95
Min.	10.47	2.21	2.36	1.35	0.05	6.52	1.52	2.91	8.87	0.20
Std. Dev.	1.06	1.01	0.96	0.92	1.16	2.03	0.73	1.74	0.83	0.94
Obs.	153	153	153	153	153	153	153	153	153	153

Source: Czech National Bank

Table A2 – Unit Root Test

	Level		First Difference	
Variable	**ADF test stat.**	**PP test statistic**	**ADF test stat.**	**PP test statistic**
LRCONS	-1.01	-1.10	-12.98***	-12.99***
LRMORT	-2.17**	-2.03**	-8.21***	-8.42***
LRSME	-2.35	-2.94	-16.80***	-16.82***
LRCORP	-2.10	-2.33	-15.85***	-15.86***
REPO	-2.92	-1.18	-3.44***	-8.48***
NPLRCONS	-0.30	-0.31	-11.81***	-11.91***
NPLRMORT	-0.28	0.04	-2.98***	-7.39***
NPLRNFC	-2.96**	-2.23	-4.09***	-9.40***
CAPTOASSETS	0.11	0.23	-13.01***	-13.41***
GBY spread	-1.18	-1.28	-8.74***	-8.57***

Notes: ***, **, * - shows statistical significance at the 1%, 5%, and 10%. The null hypothesis of Augmented Dickey-Fuller (ADF) test and Philips-Perron test (PP) states that time series have a unit root.

Source: Czech National Bank

Table A3 – Unit Root Test with a structural break

	Level				First Difference	
Variable	**ADF test statistic**	**Break Date:**	**Zivot-Andrews test statistic**	**Break Date:**	**ADF test statistic**	**Break Date:**
LRCONS	-2.93	2014M12	-3.37	2014M12	-14.69***	2005M06
LRMORT	-1.97	2010M03	-4.62*	2007M06	-8.73***	2009M12
LRSME	-2.91	2008M11	-3.68	2007M05	-17.92***	2008M08
LRCORP	-3.02	2010M11	-3.37	2006M08	-17.25***	2009M01
REPO	-4.80**	2008M10	-4.35	2008M11	-4.48**	2008M11
NPLRCONS	-2.98	2009M06	-3.23	2010M01	-13.69***	2010M09
NPLRMORT	-2.76	2008M12	-3.51	2009M03	-3.94	2013M03
NPLRNFC	-3.65	2007M04	-4.92*	2009M01	-4.51**	2007M11
CAPTOASSETS	-3.71	2009M05	-3.32	2009M07	-13.75***	2015M12
GBY spread	-2.56	2014M01	-5.53***	2008M11	-9.68***	2009M02

Notes: ***, **, * - shows statistical significance at the 1%, 5%, and 10%. The null hypothesis of Augmented Dickey-Fuller (ADF) test and Zivot-Andrew test states that time series have a unit root with a structural break in the intercept.

Source: Czech National Bank

THE CJEU ELABORATES ON THE CONCEPT OF CONSUMERS WITH RESPECT TO INTERNATIONAL JURISDICTION FOR CLASS ACTIONS

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Abstract
In its *Schrems* judgment (C-498/16) delivered on 28 February 2018 the Court of Justice of the European Union (CJEU) was called upon to decide whether a consumer may benefit from his/her privileged access to a local court when lodging a class action against a business established in another EU Member State under Brussels I Regulation. The judgment was preceded by an opinion of the Advocate General, Michal Bobek. The fundamental aim of this paper is to assess the possible consequences of this judgment with respect to the enforcement of collective interests of consumers. The paper will set out with a brief summary of the facts of the case. It will be followed by a comparison of the legal arguments made by the Advocate General and the intervening Member States as well as the legal reasoning adopted by the CJEU in its judgment. Subsequently, the availability of class action in selected Member States and plans to introduce it at EU level will be addressed. Finally, an overall assessment will be provided based on the analysis of the above issues.

Keywords
CJEU, Class action, Consumers, Facebook Ireland, Jurisdiction, Schrems.

JEL classification
D18, K33, K41, K42

1   Introduction

There are mainly two questions analyzed in the *Schrems* judgment (C-498/16) delivered on 28 February 2018 by the Court of Justice of the European Union. The first one consists in deliberating whether a consumer, who receives an enhanced protection under EU as a weaker contractual party, may, under certain circumstances, lose his or her status of consumer due to becoming a professional.

The second issue raised in the judgement discussed addresses the possibility of bringing a class action by an individual who has invited consumers residing in his or her own jurisdiction or elsewhere to assign identical claims to that consumer. The aim of this paper is to compare the judgment of the Court of Justice to the opinion of the Advocate General and to discuss the need for introducing class action, or collective redress as the European Commission terms it, at EU level, since EU law is mostly enforced and interpreted at the level of national courts which apply different national procedural rules. These have been left largely untouched by EU law and national courts often find it difficult to apply EU concepts, especially the case law of the Court of Justice of the European Union using national procedural rules (Galeta, 2011).

There is a reasonable volume of literature dealing with the need of introducing class action or collective redress at EU level (Nuyts and Hatzimihail, 2014; Tang, 2015; Fairgrieve and Lein, 2012), however, comments on the *Schrems* judgment published in printed journals have been rather scarce so far, as the limited time between delivering the judgment and writing this paper has not allowed for most review procedures applied by journals to be completed. The author was able to consult printed comments on the *Schrems* judgment published in German (Schmitt, 2018; Paulus, 2018). The literature database of the Court of Justice of the European Union has recorded twelve case-notes concerning the *Schrems* judgment as of the end of August 2018, two of them being written in Latvian, five in French and another five in German. Nevertheless, most of them do not exceed one page, the longest one (Paulus, 2018) discusses the judgment in six pages.

On the other hand, a number of online comments published mainly on consumer law blogs (Weber, 2018) have been made available at the time of writing. The online case notes, however, mostly

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summarize the judgement of the court and their analysis is rather limited in scope. The present paper will therefore rely mainly on primary sources, *i.e.* the opinion of the Advocate General, Michal Bobek, and the final judgment delivered by the Court of Justice of the European Union.

3   Facts of the Case

The reference for a preliminary ruling to by delivered by the Court of Justice of the European Union is a tool introduced by Article 167 of the Treaty on Functioning of the European Union which is aimed at assisting national courts interpreting EU law to provide its correct assessment. If a national court applying EU law is unsure whether its decision would comply with EU law if may ask the Court of Justice of the European Union for its binding legal judgement on the interpretation of EU law. First instance court have the liberty of raising a reference for a preliminary ruling whereas appeals courts have an obligation to refer the case to the Court of Justice should uncertainties about the meaning of EU law persist (Craig and de Búrca, 2015; Mathijsen, 2010).

The applicant, Mr. Schrems, an Austrian citizen, sued Facebook Ireland, the defendant for breaching his right to data protection. The proceedings brought before the first instance Austrian court were special inasmuch it was not an individual claim, but a class action in which Mr. Schrems tried to claim rights of other consumers, residing either in Austria, Germany or India, who assigned their claims to the applicant. The first instance Austrian court decided that Mr. Schrems was not a consumer and hence he could not rely on the privileged access to an Austrian court, but should sue the defendant in the state where it was domiciled, that is in Ireland. Article 16 of the Brussels I Regulation No 44/2001 gives consumers a choice of jurisdiction between the place of their own residence and the domicile of the defendant. Article 16(1) of the said regulation reads as follows:

"A consumer may bring proceedings against the other party to a contract either in the courts of the Member State in which that party is domiciled or in the courts for the place where the consumer is domiciled."

To qualify for the choice of jurisdiction, the applicant shall be a consumer. Mr. Schrems used his Facebook account, in his own words, for private purposes, however, he also posted information on the legal action he took against Facebook to attract numerous followers and friends worldwide. The defendant, on the other hand, claimed that Mr. Schrems used his Facebook profile for professional purposes and therefore cannot benefit from consumer protection foreseen in Brussels I Regulation. The first instance court agreed with the Defendant´s line of reasoning. However, when Mr. Schrems appealed the first instance judgment, the appeals court believed that Mr. Schrems keeps the status of consumer, even if he has acquired some professional experience in the field of data protection and was writing his Ph.D. thesis on the legal aspects of data protection. However, the appeals court was only willing to admit an individual consumer action brought by Mr. Schrems, not a class action (in Austrian law termed as "Sammelklage") as the conditions for the class action laid down in the Austrian Code of Civil Procedure (Zivilprozessordnung) were not met.

One of the conditions for bringing a class action before Austrian courts requires all application to share the same territorial jurisdiction. That is to say, that if all the applicants made their individual claims, all of them would be dealt with by the same court. As this was not the case, the appeals court turned down the class action proposal (Schmitt, 2018). "Both parties have challenged the appeal decision before the Oberster Gerichtshof (Supreme Court). That court has stayed the national proceeding and referred two preliminary questions to [the Court of Justice of the European Union]" (CJEU, 2018b).

4   Opinion of the Advocate General

The opinion of the Advocate General precedes the judgement of the Court of Justice of the European Union. The aim of the opinion of the Advocate General is to provide an impartial and independent assessment of the case which is not binding upon the court formation deciding about the case. The

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opinion of the Advocate General basically replaces an inexistent second instance of a court, since the judgments on preliminary references are decided by the highest EU court and there is nowhere to appeal against them. Most of the time, the Court of Justice of the European Union follows the proposals of the Advocate General and this was the case at hand as well.

The first question the Advocate General was called upon to reply was whether the concept of consumer is static or whether it is dynamic in time. Can a consumer lose his or her status of consumer when he stops using his or her Facebook account for private purposes only and starts using it for professional purposes as well? Previous case law of the Court of Justice (especially the *Gruber* judgement) suggests that a marginal use of products or services acquired for private use for professional purposes does not deprive the consumer from his or her consumer rights. The Advocate General thus had to assess whether the activities pursued by Mr. Schrems fell mostly outside his professional activities. Also, another issue at stake would be the applicable date for assessing the quality of consumer. Shall the status of consumer be qualified as of the date of bringing an action or shall it be evaluated as of the date of concluding the contract between the customer and the service provider?

The Advocate General insists that the assessment of the consumer status is always contract-specific (CJEU, 2018b, at point 30). Looking at the nature of a Facebook account, the Advocate General believes that it is rather common to be used for "self-promotional purposes with a professional impact or purpose. Any individual may post about his professional achievements and activities of a (quasi-)professional nature and share them with a community of ´friends´" (CJEU, 2018b, at point 46). While assessing the status of consumer, the Advocate General goes on to say that "Knowledge, experience, civic engagement or the fact of having acquired certain renown due to litigation do not in themselves prevent someone from being a consumer" (CJEU, 2018b, at point 56) to conclude that "carrying out of activities such as publishing, lecturing, operating websites, or fundraising for the enforcement of claims does not entail the loss of consumer status for claims concerning one´s own Facebook account used for private purposes" (CJEU, 2018b, at point 62). To sum up the Advocate General´s answer to the first questions, he believes that using Facebook for self-promotion does not convert a consumer to a professional. Mr. Schrems should thus benefit from the choice of jurisdiction for the purpose of bringing an individual action against Facebook Ireland.

As for the second question, the Brussels I Regulation does not lay down any rules for applicable jurisdiction with respect to assigned claims or with respect to class actions. Some *amici curiae* statements were made by the Austrian, German and Portuguese Governments in this respect. Whereas these governments believe that the enhanced consumer protection should also apply to assigned claims irrespective of the domicile of the consumers who have assigned their claims, the European Commission was only willing to concede this privilege to those consumer sharing the same domicile as the applicant to whom the claims were assigned. The Advocate General is convinced that there is no legal basis for such a reasoning and that the Court of Justice should by no means act as a legislator allowing for enhanced protection of consumers in class actions which are not mentioned in the Brussels I Regulation. This holds particularly true in a situation where the European Commission is well aware of the fact that national procedural rules matter when it comes to enforcing EU substantive rules and it has already proposed a legal framework for collective redress at EU level where the legislative process has not been completed yet. Hence, at present there is no binding legislative instrument at EU level governing class actions or collective redress available to consumers in cross border claims (CJEU, 2018b, at points 121 and 122). Having said that, the Advocate General concludes that Austrian courts should not be authorized to admit a class action unless it complies with the national procedural rules of class actions under Austrian law (CJEU, 2018b, at point 124).

5   Judgment of the Court

Whereas the opinion of the Advocate General contains an in-depth analysis of the legal points raised by the Austrian Supreme Court covering 25 pages, the judgment of the Court of Justice of the

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European Union is much shorter, not exceeding ten pages of text. The judgment sets out with an extensive quotation of the principles on which Brussels I Regulation is based, in particular the predictability of jurisdiction and the strict reading of the exceptions to the rule of basing the jurisdiction in the defendant's domicile. The judgment recalls that Brussels I Regulation is still applicable even though it had been repealed and replaced by Brussels I Regulation Recast, since the latter only applies to proceedings initiated (at national level) after 10 January 2015. The judgment then summarizes the facts of the case in a similar vein to that done by the Advocate General to further discuss the notion of a consumer with respect to the activities carried out by Mr. Schrems.

By analogy to what the Advocate General expressed in his opinion, the judgment stresses the need to assess the status of a consumer with respect to a particular contract, "having regard to the nature and objective of that contract and not to the subjective situation of the person concerned, since the same person may be regarded as a consumer in relation to certain transactions and as an economic operator in relation to others" (CJEU, 2018a, at point 29). Also, the judgment makes reference to the *Gruber* judgement cited in the opinion of the Advocate General, with respect to contracts having a dual purpose (both private and professional), recalling that consumer protection may only by invoked if the professional use of goods of services is so marginal that it can be practically neglected (CJEU, 2018a, at point 32). The Court goes on to examine the dynamic nature of a consumer when reflecting on the possibility of converting an initial consumer status of using a Facebook account to a purely professional use of this social network (CJEU, 2018a, at point 38). In this context, the Court agrees with the reasoning of the Advocate General that the activities carried out by Mr. Schrems on his Facebook account have been no means had a predominantly professional nature and therefore Mr. Schrems has not lost his condition of consumer over time. He should therefore be not deprived of his consumer status for the purpose of choosing the international jurisdiction of the court when bringing his action against an economic operator (CJEU, 2018a, at point 39).

While assessing the second legal question on the applicability of Brussels I Regulation to class actions, the Court recalls its earlier case-law by saying that "the consumer is protected only in so far as he is, in his personal capacity, the plaintiff or defendant in proceedings. Consequently, an applicant who is not himself a party to the consumer contract in question cannot enjoy the benefit of the jurisdiction relating to consumer contracts" (CJEU, 2018a, at point 44). The Court goes on to cite the opinion of the Advocate General who stressed that an assignment of claims is not capable of establishing "a new specific forum for a consumer to whom those claims have been assigned" (CJEU, 2018a, at point 48).

Summarizing the judgment of the court, it is clear that the court has thoroughly followed the legal reasoning offered by the Advocate General. It recognized the status of a consumer to a person who uses his Facebook account for the purpose of promoting his activities of publishing, lecturing and running websites. Yet, it has not conceded a special forum for class actions in transnational cases where claims have been assigned to a single applicant. This is a task for a legislator rather than for a law court to fulfill, as correctly pointed out by the Advocate General.

6   Reception of the Judgment

The judgment of the Court of Justice in the *Schrems* case has also received media attention outside the European Union. The judgment was reported in an American legal digest (Bilgic, 2018). It is also likely to speed up the European Commission´s effort to push its published proposal for collective redress at EU level through the legislative process. However, time seems to be the Commission´s enemy as the term of office of the present Commission will expire in the spring of 2019. If the legislative procedure has not been completed by then, the proposal may fail to be adopted. Given the time stress accompanying the Commission´s preparatory works, it is questionable whether a speedy proposal lacking a thorough general discussion will be the one which best suits the collective interests of European consumers with respect to avoiding the most serious shortcomings of the American style class actions where consumers seem to be the losers. In American class actions lawyers benefit from

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these legal instruments much more than consumers. Whereas lawyers manage to earn a very high income if the class action is successful, consumers benefit from very little money, if any. A well balanced proposal, avoiding abusive class litigation and favoring consumers more than those representing their legal interests will be of more value that a fast-track regulation adopted at all costs.

The access of consumers to class actions or lack of it has become very topical in relation to the Volkswagen emissions scandal which demonstrated that consumers were misled about the amount of emissions emitted by the cars they purchased. Whereas consumers in some EU Member States were able to obtain access to justice via collective redress, many EU Member States do not foresee this avenue of mass compensation of damages. This obviously creates certain room for taking action at EU level. The European Commission adopted its first recommendation on common principles for injunctive and compensatory collective redress mechanisms in the Member States concerning violation of rights granted under Union law in 2013 (European Commission, 2013). Since this recommendation lacks a binding nature, its follow-up in the Member States has been rather modest. An implementation study commissioned by the European Commission (European Commission, 2018a) revealed, that nine Member States still have not put in place any collective redress mechanisms to date, whereas those EU Member State where class actions are available apply some principles which may not always follow the those stated in the 2013 Commission Recommendation. Following the adoption of the 2013 Recommendation new or amended legislation on compensatory collective redress has been adopted in four Member States. The resulting picture of available judicial recourse to collective redress is thus very diverse in a number of issues, such as the standing to bring an action for collective redress, its admissibility criteria, as well as the national legislator´s option for an opt-in or an opt-out system. For the sake of clarity, some of the most essential divergences in national regulation of collective redress have been summarized in the following table below:

Table 1. (Un)availability of compensatory collective redress mechanisms in EU Member States as of January 2018

Collective redress *available*	Collective redress *available*	Collective redress *unavailable*
Austria	Lithuania*	Czech Rep.**
Belgium*	Malta	Slovakia
Bulgaria	The Netherlands	Slovenia**
Germany	Poland	Cyprus
Denmark	Portugal	Estonia
Finland	Rumania	Latvia
France	Spain	Croatia
Greece	Sweden	Ireland
Hungary	United Kingdom	Luxembourg
Italy		

* New acts governing collective redress have been adopted as a follow-up to the Commission recommendation.
** These countries published proposals for new acts governing collective redress, but the respective legislation has not been adopted yet at the time of writing.

Source: Own compilation based on the data provided by the European Commission in European Commission, 2018a; updated by more recent information covering the Czech Republic..

Given the limited impact of the 2013 Commission Recommendation mentioned above, the European Commission decided to take a more rigorous action with respect to class action available to consumers across the EU by announcing its "New Deal for Consumers" in April 2018 (European Commission, 2018b). One of the legislative promises made by the New Deal is to introduce a representative class action to dissuade businesses from applying misleading practices to consumers.

"Under the New Deal for Consumers it will be possible for a qualified entity, such as a consumer organization, to seek redress, such as compensation, replacement or repair, on behalf of a group of consumers that have been harmed by an illegal commercial practice. In some Member States, it is already possible for consumers to launch collective actions in courts, but now this possibility will be

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available in all EU countries" (*Ibidem*). It remains to be seen if the European Commission manages to push through a clear and acceptable wording of the corresponding legislative proposal (European Commission, 2018c) published on the same day as the New Deal for Consumers by the end of its term of office.

7   Conclusion

Even though the *Schrems* judgment has not opened the way for a privileged international jurisdiction with respect to consumer class actions concerning assigned claims, it has served as model for those wishing to bring an individual action against a big company. Thus, individual applicants in all EU Member States should not be discouraged from brining legal action against a big economic operator, such as Facebook Ireland. The judgment of the CJEU basically reflects the outcome of the legal reasoning provided by the Austrian appeals court, which conceded Mr. Schrems consumer status, but disallowed his class action for the assigned claims. Had the Austrian Supreme Court not referred the case to the CJEU and had it confirmed the reading of the judgment delivered by the Austrian appeals court, the legal result would have been the same.

Also, the judgment has reopened the political debate on the need to regulate class action at EU level or at least at national level as collective redress is currently not available in all EU Member States. However, only proposals striking a fair balance between the rights of consumers and their legal representatives will be worth adopting, since fast tract legislation is unlikely to improve the procedural position of European consumers who often struggle with national procedural rules trying to enforce their substantive rights derived from EU law.

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RESEARCH AND DEVELOPMENT EXPENDITURE IN CONTEXT OF EUROPE 2020 STRATEGY

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Abstract
The paper focuses on R&D expenditure in EU countries as a target of the Europe 2020 strategy. Expenditure on research and development (R&D) is analysed and evaluated more deeply by the sectors of performance and type of R&D activity in 19 selected EU countries, as the average of the period 2010-2015. The relations among the respective categories of R&D expenditure in the selected countries were tested by means of correlation analysis. The evaluation of R&D expenditure (total GBAORD as a % of total general government expenditure; R&D expenditure in the government sector % of GDP; R&D expenditure on basic research % of GDP; R&D expenditure on applied research % of GDP and R&D expenditure on experimental development % of GDP) as the average of the period 2010-2015 in the selected EU countries was performed by means of cluster analysis. Based on the selected indicators, the countries were divided into four clusters by their internal similarity. The biggest similarities were found in all countries in R&D expenditure in the government sector and R&D expenditure on basic research.

Keywords
Cluster analysis, Development**,** Evaluation, Europe 2020,Expenditure, Research.

JEL classification
C38, H59, H76, O32, O39

1   Introduction

To implement the strategy Europe 2020 in the field of research and development (R&D), areas to focus on are better conditions for financing research, development and innovations, where financial capabilities of the EU countries are an important prerequisite. In R&D, member states should begin investing 3% of their GDP (1% public resources, 2% resources from the private sector) by no later than 2020 (European Commission, 2010). Total expenditure on R&D (GERD) in % of GDP includes all investment- and non-investment expenditure allocated to R&D in the area of a given country over the observed period, regardless of the source of financing. International comparison mostly measures total expenditure on R&D (GERD) towards GDP. This financial relation is called "research and development intensity" and belongs to the group of elementary structural indicators evaluating the progress of strategy Europe 2020 objective-fulfilments in individual EU countries. The indicator of expenditure on R&D in relation to GDP enables a view on a country's innovation capacity and allows for assessing the effort of a country in generating new knowledge and using the results of research with verifiable positive externalities (OECD, 2015; Voigt and Moncada-Paternò-Castello, 2012).

Total R&D expenditure (R&D Intensity) and its structure can be evaluated from the functional perspective by performance sectors, type of research and development activity, type of cost or economic area (NACE classification). The paper focuses on total R&D expenditure in EU countries as one of the Europe 2020 strategy targets. The paper aims to evaluate total R&D expenditure and its structure by performance sectors and type of research and development activity in the selected EU countries. Similarities and differences in the selected categories of R&D expenditure over the years 2010-2015 are evaluated by means of cluster analysis.

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2   Literature review

Expenditure on R&D are a significant indicator for the evaluation of one target of the Europe 2020 strategy, and a number of authors argue it is also key for the evaluation of competitiveness of economies and innovation performance (Majerová, 2015; Šoltés and Gavurová, 2015; Staníčková and Melecký, 2014). Priede and Neuert (2015) address issues of the competitiveness gap of the European Union member countries in the context of Europe 2020 strategy's smart growth and examine R&D expenditure and its impact on patents and high-technology share in exports as one of the indicators of competitiveness. Innovation performance in EU countries with focus on the individual categories of innovators (Innovation Leaders, Strong Innovators, Moderate Innovators, Modest Innovators) is dealt with by Prokop and Stejskal (2017). Conte et al. (2009) review innovation performance of different EU Member States and provides estimates of the relative efficiency of their R&D spending. Juricková (2014) analyses and compares R&D expenditure of five of the most innovative countries of the European Union, measured by the number of patent applications ranked in 2012, and people's innovation potential. Gardocka-Jalowiec (2012) analyses and assesses R&D activities and the structure of R&D expenditure in Poland in comparison to EU-27 states in the years 2004-2010, and their impact on the innovativeness of their economies.

Other research evaluate R&D expenditure in EU countries in the context of the Europe 2020 strategy, its relation to economic growth or efficiency of R&D expenditure. Albu (2011) focuses on research and development spending in the EU and their growth in the perspective of the Europe 2020 Strategy. Tkač et al. (2017) deal with the structure of R&D expenditure in selected countries formulated in the Strategy Europe 2020 and will predict the expected development of the indicator expressing the share of expenditure on R&D in GDP of the countries in order to determine whether the targets set for each country are achievable by 2020. Torrecillas et al. (2017) assess a potential dual role of public expenditure in R&D upon economic growth and employment, using these dimensions as partial representations of the socioeconomic state of affairs in European Union's Member States. Szarowská (2016b) investigates the influence of R&D expenditure on economic growth in 20 selected EU member states in the period 1995-2013. Results confirm positive and statistically significant impact of government R&D expenditure, which is the main driver for economic growth during the analysed period. The same author Szarowská (2016a) quantify effect of public R&D expenditure on economic growth in 8 selected Central and Eastern European countries (Bulgaria, Czech Republic, Hungary, Latvia, Poland, Romania, Slovak Republic and Slovenia) in the period 1995-2014. Kokko et al. (2015) examine the link between R&D spending and economic growth in the EU and other regions. The results suggest that the growth-enhancing effect of R&D in the EU15 countries does not differ from that in other countries in general, but it is less significant than that for other industrialized countries.

Many authors focus on changes to the structure of R&D expenditure by sector performance and other actual problems. Freimane (2016) asses the effect of private and public research and development expenditure on the economic growth in European Union countries. Author show that policy in EU countries should put more focus on the distinction between private and public R&D, and governments should stimulate private R&D. Other author Corea (2014) evaluate of public expenditure in science, technology, and innovation (STI) in developing countries. Author show that developing economies have been paying more attention to the contribution of STI policies to their development strategies and consequently investments in research and innovation by developing nations have increased substantially in the past decade. Guellec and Van Pottelsberghe de la Potterie (2003) attempts to quantify the aggregate net effect of government funding on business R&D in 17 OECD Member countries over the past two decades. Bojnec and Ferto (2014) examine the effects of research and development (R&D) spending on merchandise export by low, medium-low, medium-high, and high technological intensity of the products between OECD countries. Ragwitz and Miola (2005) give a critical picture of the expenditure in research, development and demonstration (RD&D) for renewable energy sources (RES) in the EU-15 Member States.

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3   Methodology and data

The paper uses data available from Eurostat Statistic database (Statistic on research and development-R&D expenditure at national level) in years 2010–2015. For the sake of the assessment, 2010 was chosen as the first year of the application of the Europe 2020 strategy in research and development and 2015 as the half of the strategy period. The selected group comprises 19 EU countries (Bulgaria-BG, Czech Republic-CZ, Denmark-DK, Estonia-EE, France-FR, Croatia-HR, Italy-IT, Cyprus-CY, Latvia-LV, Lithuania-LT, Hungary-HU, Malta-MT, Netherlands-NL, Poland-PL, Portugal-PT, Romania-RO, Slovenia-SI, Slovakia-SK, United Kingdom-UK). The selected countries were chosen on the basis of available data in relation to the structure of total R&D expenditure. Total R&D expenditure is analysed and evaluated, as well as its structure by performance sectors and the type of research and development activity as average of the period 2010-2015. Applying correlation analysis and Pearson correlation coefficient (r), mutual correlations between indicators of R&D expenditure, and cluster analysis is used for the evaluation of similarities and differences of selected categories of R&D expenditure. The correlation analysis aims to determine the intensity of the linear correlation between the points X and Y. The points then comprise a set which demonstrates characteristic features of correlations of both areas (Lynch, 2013).

Cluster analysis is a multi-dimensional statistical method used for classification of objects. (Hennig, et al., 2015). It sorts units (19 selected EU Member states the present example) into groups (clusters) so that units belonging in the same group are more similar then objects from other groups. Hierarchic clustering was applied, which generates a system of sub-sets: branching, softening of the classification. Thus, hierarchical tree diagram (i.e. dendrogram) is widely applied for depiction of final distances between objects. A dendrogram indicates that the larger the size on the horizontal axis (x), the less similar, in the present case, the EU Member states are. Conversely the smaller the distance on the x axis, the larger the similarity between countries. Box plot is one way of visualizing numerical data by means of their quartiles. The middle "box" part of the diagram is delineated by the third quartile from the top, and the first quartile from the bottom, whilst the mean is expressed by a line in-between. Box plots can also contain lines beginning in the middle part of the diagram vertically up and down, the so-called whiskers, which express variability of data below the first and above the third quartile. Cluster analysis was applied in connection to the evaluation of the targets of the Europe 2020 strategy and in evaluating R&D expenditure in EU in research by Bere and Bucerzan- Precup (2015); Bubanić and Detelj (2017). The calculations in the following part are the output of the SPSS Statistics 24.0 software.

4   Empirical results and discussion

This part of the paper deals with the evaluation of total R&D expenditure in the context of the target of the Europe 2020 strategy, the structure of total R&D expenditure by sector performance and by the type of R&D activity in selected EU countries. Next, correlations between R&D are observed and selected categories of R&D expenditure evaluated, using cluster analysis as average of years 2010-2015.

4.1   Total expenditure R&D in the context of the Europe 2020 strategy

Total R&D expenditure as % of GDP over the period 2010-2015 in selected EU countries and target till 2020 is seen in Figure 1. Only Denmark, Cyprus and the Czech Republic (regarding public expenditure) fulfilled the defined target of the Europe 2020 strategy in R&D over the observed period. Data regarding TARGET is not available for the UK (Fig. 1).

Total expenditure on R&D (GERD) includes expenditure in four sectors of R&D (business enterprise, government, higher education, and private non-profit sector). The share of expenditure on research and development in the private non-profit sector is none or very small in many countries, these were not included, as a result.
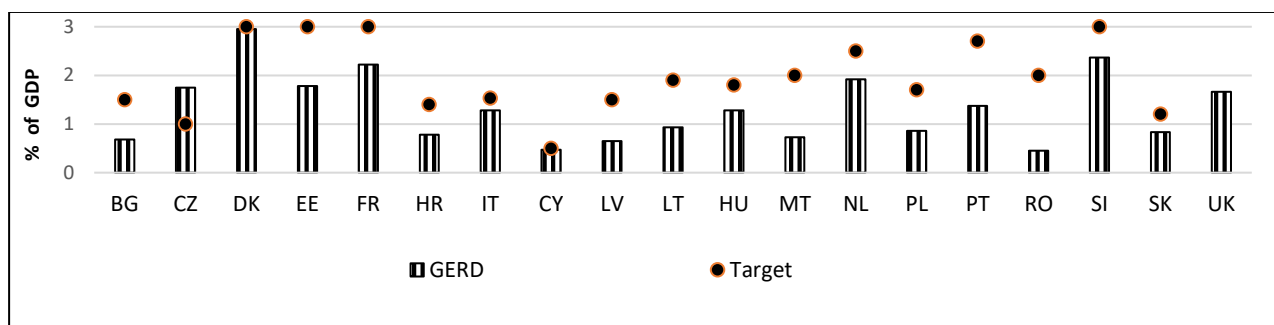
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Fig. 1. Total R&D expenditure in 2010-2015 and target 2020 as % of GDP (Source: Eurostat)

Figure 2. shows total R&D expenditure and structure R&D expenditure by sector performance over the period 2010-2015 in selected EU countries as % of GDP.

	BG	CZ	DK	EE	FR	HR	IT	CY	LV	LT	HU	MT	NL	PL	PT	RO	SI	SK	UK
GERD	0,68	1,75	2,95	1,78	2,22	0,78	1,28	0,47	0,65	0,93	1,28	0,73	1,92	0,86	1,37	0,45	2,37	0,83	1,66
BERD	0,44	0,97	1,91	0,90	1,43	0,37	0,72	0,10	0,18	0,27	0,87	0,41	1,07	0,38	0,6	0,19	1,7	0,32	1,07
GOVERD	0,19	0,33	0,07	0,17	0,3	0,2	0,18	0,07	0,16	0,18	0,19	0,06	0,2	0,21	0,09	0,18	0,32	0,21	0,13
HERD	0,05	0,43	0,96	0,6	0,47	0,21	0,35	0,24	0,28	0,48	0,20	0,25	0,6	0,28	0,56	0,09	0,26	0,28	0,43
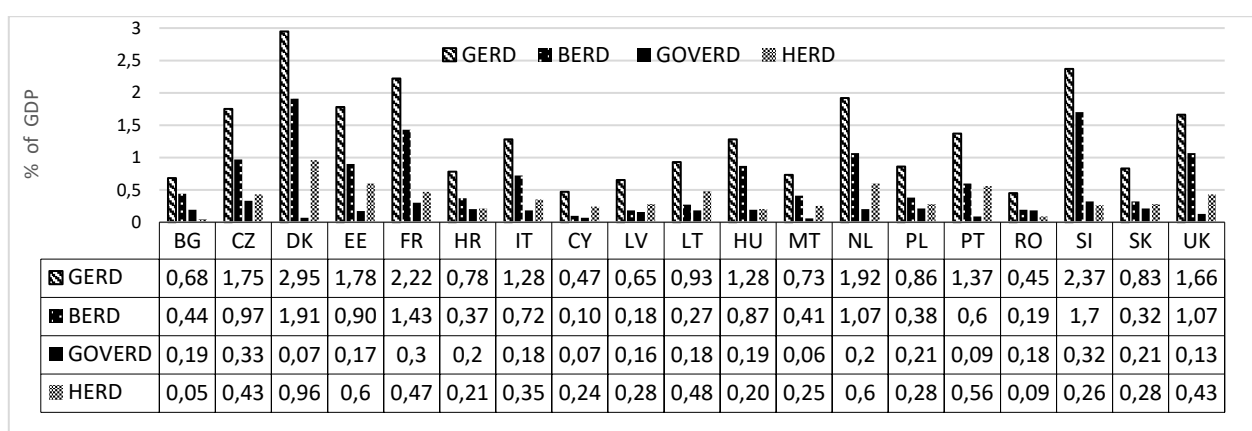
Fig. 2. Total R&D expenditure and their stucture by sector performance as % of GDP in 2010-2015 (Source: Eurostat)

The highest total R&D expenditure as % of GDP (R&D intensity) were found in Denmark (2.95%), Slovenia (2.37%) and France (2.22%), and these countries also allocated the highest resources and R&D expenditure in the business enterprise sector (BERD) as % of GDP (DK-1.91; SI-1.7; FR-1.43). The results make it clear that these countries approached the target of the Europe 2020 strategy in R&D in the period 2010-2015. By contrast, the lowest total R&D expenditure as % of GDP is seen in Romania and Cyprus (around 0.45 %). These countries and Latvia also allocated the lowest R&D expenditure as % of GDP in the business enterprise sector (CY- 0.10; RO- 0.19; LV- 0.18). Public R&D expenditure also include expenditure in the government and higher education sector. Over the observed period, Czech Republic (0.33) and Slovenia (0.32) allocated the highest R&D expenditure in the government sector (GOVERD) as % of GDP, and the lowest GOVERD were observed in Malta (0.06), Denmark and Cyprus (0.07). The highest R&D expenditure in the higher education sector (HERD) as % of GDP was reached in Denmark (0.96), followed by the Netherlands and Estonia (0.6). The lowest HERD as % of GDP were found in Bulgaria (0.05) and Romania (0.09), which can be partially explained by very low total R&D expenditure in these countries, compared to the other countries. The results show that the observed period 2010-2015, only Denmark fulfilled the allocated public R&D expenditure of 1% GDP, and the Netherlands, France and the Czech Republic approach the set target of the Europe 2020 strategy in R&D (Fig. 2). Similar results are seen also in other research (e.g. Conte et al., 2009; Corea, 2014; Freimane, 2016; Szarowska, 2016a, b).

Evaluation of the structure of total R&D expenditure according type of R&D activity in the selected EU countries over the period 2010- 2015 expressed in % is seen in Figure 3. According to OECD (2015) R&D activities include basic research, applied research and experimental development.

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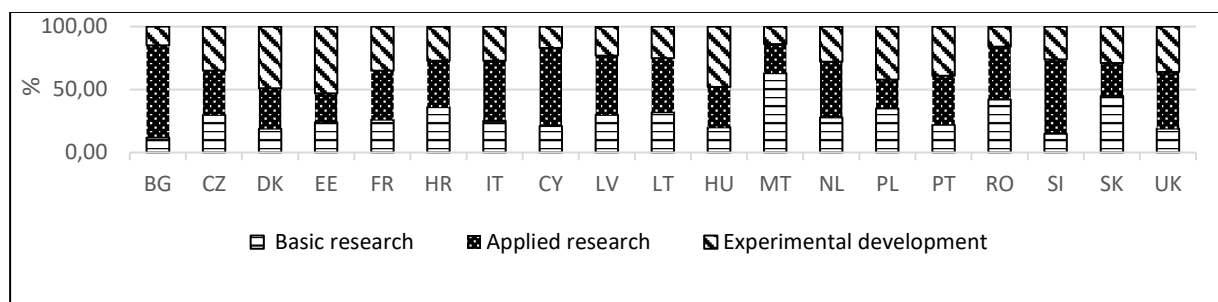"Economic Policy in the European Union Member Countries"
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Fig. 3. Total R&D expenditure by type of R&D activity in selected EU countries in 2010-2015 (%) (Source: Eurostat)

Regarding the observed countries, the highest share of expenditure on basic research as % of total R&D expenditure was seen in Malta (63%) and Slovakia (45%). The lowest share of expenditure on basic research was seen in Bulgaria (12%) and Slovenia (15%). The most significant representation of expenditure on applied research as % of total R&D expenditure, from the observed countries, was seen in Bulgaria (73%), Cyprus (62%) and Slovenia (59%), compared to Estonia, Malta and Poland (around 23%). The highest representation of expenditure on experimental development as % of total R&D expenditure is seen in Estonia (53%), Denmark (49) and Hungary (48). By contrast, the lowest share of expenditure on experimental development was allocated by Malta (14%), Bulgaria (15%) and Romania (16%) over the observed period. The results clearly show that the allocated total R&D expenditure vary markedly between the EU countries, which is reflected on in their structure. To some extent, trends and defined priorities of national R&D policies are also reflected, as well as financial capabilities for the development of R&D in the countries. The types of R&D activities are dealt with in other research also, for instance by Gulbrandsen and Kyvik (2010).

4.2 Evaluation of R&D expenditure by used cluster analysis

At first, testing of R&D expenditure indicators in selected EU countries is performed, using correlation analysis and Pearson correlation coefficient. Results of testing and correlation of the individual R&D is seen in Table 1. A strong, statistically significant correlation at ($p < 0.01$) was found between 1) Total GBAORD as % of total general government expenditure and R&D expenditure on experimental development as % of GDP (0.675); 2) between R&D expenditure on experimental development and R&D expenditure on basic research as % of GDP (0.667); 3) between R&D expenditure on experimental development (% of GDP) and R&D expenditure on applied research % of GDP (0.620). Another statistically significant correlation was found at ($p<0.05$) in total GBAORD a R&D expenditure on basic research as a % of GDP (0.560).

Table 1. Correlation of indicators R&D in selected EU countries (2010-2015)

	GBAORD	GOVERD	R&D Exp. BR	R&D Exp. AR
GOVERD (% of GDP)	-0.032			
R&D Exp. BR (% of GDP)	0.560[*]	0.210		
R&D Exp. AR (% of GDP)	0.381	0.372	0.448	
R&D Exp. ED (% of GDP)	0.675[**]	0.056	0.667[**]	0.620[**]

Note 1: GBAORD - Total GBAORD (as a % of total general government expenditure); GOVERD- R&D expenditure in government sector (% of GDP); R&D Exp. BR - R&D expenditure on basic research (% of GDP); R&D Exp. AR- R&D expenditure on applied research % of GDP; R&D Exp. ED- R&D expenditure on experimental development (% of GDP). Note 2: * Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

Source: Author calculation according to Eurostat.

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Further, R&D indicators of expenditure are evaluated in the selected EU countries (Total GBAORD as a % of total general government expenditure; R&D expenditure in government sector as % of GDP; R&D expenditure on basic research as % of GDP; R&D expenditure on applied research as % of GDP; R&D expenditure on experimental development as % of GDP) over the period 2010-2015 using cluster analysis. Results of similarities and differences by categories of R&D expenditure in the countries is depicted in the dendrogram (Fig.4a). The selected EU countries were divided into four clusters based on their internal similarity. The first cluster comprises five countries (BG, LT, MT, PL, RO), which show a high similarity of all observed R&D expenditure. The second cluster comprises six countries (CZ, DK, EE, FR, NL, PT), where the highest similarity is seen in the Czech Republic, the Netherlands and France, and Estonia and Portugal. The third cluster comprises seven countries (HR, CY, HU, IT, LT, SK, UK) with the highest similarity of R&D expenditure in Lithuania, Slovenia and Cyprus, and Italy, United Kingdom and Hungary. A specific position and an independent cluster is formed by Slovenia, with high expenditure on applied research as % of GDP and low expenditure on basic research % of GDP and expenditure R&D in the government sector.
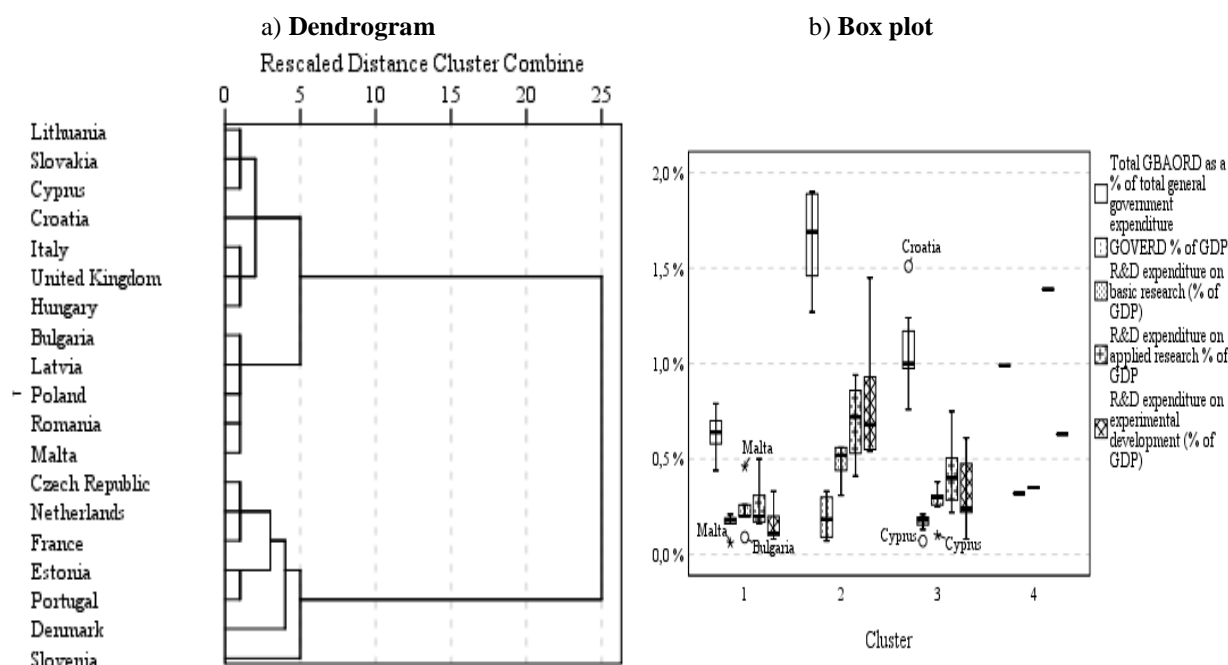
Fig. 4. Evaluation of R&D expenditure in selected EU countries by using Dendrogram and Box plot (Source: Author)

More detail about the differences and similarities by the selected categories of R&D expenditure in the respective clusters of countries is provided in the box plot (Fig. 4b). The inter-quartile range is the difference between percentile 75 and 25 and equals the length of the box. **The first cluster** is typical of countries with low expenditure in the government sector and expenditure on basic and applied research and expenditure on experimental development as % of GDP. The extreme value (indicated with an asterisk), which is higher than three quartile range from the end of the box, is seen in Malta in the case of low R&D expenditure in the government sector (only 0.06% of GDP) and with notably higher R&D expenditure on basic research compared to the median in the remaining countries in the first cluster. The outlier (indicated by a circle), which lies between 1.5 quartile range and 3-quartile range from the beginning of the box, is represented by Bulgaria from the countries of the first cluster regarding expenditure on basic research (only 0.09% of GDP). **The second cluster** is characteristic of countries with the highest total GBAORD as % of total general government expenditure and low R&D expenditure in the government sector (GOVERD) as % of GDP. **The third cluster** includes countries with the second highest expenditure on GBAORD as % of total general government expenditure of all EU countries observed and with relatively low other categories of

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R&D expenditure. The outlier was found in Croatia with the highest expenditure GBAORD as % of total general government expenditure (1.51%). Conversely, the lowest expenditure on GBAORD was found in Hungary (0.76%). In Cyprus an outlier was found (the lowest R&D expenditure in GOVERD, only 0.07% of GDP) and an extreme value in R&D expenditure on research (only 0.10% of GDP) compared to the other countries of the third cluster. **The fourth cluster** comprises Slovenia, with comparable total GBAORD as % of total general government expenditure with the median value of the third cluster and with the highest expenditure on applied research as % of GDP (1.39%) from all observed countries and relatively low GOVERD expenditure and expenditure on basic research as % of GDP.

Over the period 2010-2015, the largest differences were found in the observed categories of R&D expenditure between the countries of the first and second cluster, mainly in total GBAORD as % of total general government expenditure. Other significant differences were proved in countries of the first cluster with Slovenia, mainly in R&D expenditure on applied research as % of GDP. Conversely, the highest similarities were found in countries of the first and third cluster in the case of GOVERD and R&D expenditure on basic research as % of GDP.

5   Conclusion

Research and development are important sources of economic growth and social welfare and play a key role in creating new knowledge, products and technological processes. The analysis of total R&D expenditure as % of GDP over the period 2010-2015 in the observed EU countries showed that the highest R&D intensity is in Denmark, Slovenia and France, as opposed to Romania and Cyprus with the lowest. The target set in the countries in terms of the Europe 2020 strategy in R&D over the observed period is fulfilled by Denmark and Cyprus. The Netherlands, France and the Czech Republic approach the set target. In Denmark and Slovenia, the highest allocated R&D expenditure in the business enterprise sector. By contrast, the highest public R&D expenditure (government and higher education sector) was allocated by Denmark, Estonia, Netherlands, France and Czech Republic over the observed period. Evaluation of the structure of total R&D expenditure according to the type of R&D proved that the highest share of R&D expenditure on basic research was allocated by Malta and Slovakia, by Bulgaria, Cyprus and Slovenia on applied research, and by Estonia, Denmark and Hungary on experimental development.

On the basis of testing of correlation between R&D indicators in the observed countries over the period 2010-2015, a strong, statistically significant correlation was proved in total GBAORD as % of total general government expenditure and R&D expenditure on experimental development and on basic research as % of GDP, and other strong, statistically significant correlation was found between R&D expenditure on experimental development and R&D expenditure on basic and applied research as % of GDP. The evaluation of R&D expenditure indicators using cluster analysis proved the largest differences mainly in total GBAORD as % of total general government expenditure, and other significant differences were found in R&D expenditure on applied research as % of GDP. In contrast, the strongest similarity in the observed countries are seen in R&D expenditure in the government sector as % of GDP. The structure of R&D expenditure can be analysed by different criteria, also applying other methods. In the paper, only selected categories of R&D expenditure were chosen, since an in-depth analysis would extend the range of the paper, which could be a theme for further research.

6   Acknowledgement

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ANALYSIS OF SOCIAL PROTECTION EXPENDITURE IN RELATION TO POVERTY AND SOCIAL EXCLUSION IN EU COUNTRIES

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Abstract

In tackling social risks, such as poverty and social exclusion, social policy in EU countries stems from the economic potential of countries, national systems of social protection and the extent of processes of redistribution defined by the volume of social protection expenditures. The paper aims to evaluate social protection expenditure by functions with emphasis on similarities and differences and in relation to poverty and social exclusion. The research was carried out in EU countries in the period 2007-2015, using cluster and correlation analysis. The results of the cluster analysis showed a similar structure, but also marked differences of social benefits by functions. The results revealed the largest differences in the structure of social benefits between countries in the second and fourth cluster (by social benefits on old age and survivors) and countries in the first and second cluster (by social benefits on sickness/healthcare and disability and benefits on old age and survivors). The results of correlation analysis showed moderate negative relation between social protection benefits (all functions and by selected functions - sickness/healthcare, family/children, housing, social exclusion) on the one hand and income poverty and social exclusion on the other.

Keywords

EU countries, Expenditure on social protection, Poverty, Social benefits by functions, Social exclusion.

JEL classification

C38, H53, I30, I38

1   Introduction

Current concepts of poverty develop towards a broader view on living conditions, not concentrating solely on income poverty. In 2002 Eurostat proposed a conceptual framework for measuring social exclusion, which presented income poverty as one of the aspects of social exclusion. A number of studies deal with not only analyses and evaluation of public expenditure and public service from various perspectives (Halásková, 2015) or expenditure on social protection (Izák and Dufková, 2006; Bontout and Lokajičková, 2013; Molina-Morales et al, 2013; Sucur, 2016), but also the relationship between government expenditure and poverty (Mehmood and Sadig, 2010) or relation total expenditure on social protection and income poverty or social exclusion (Caminada and Goudswaard, 2012; Nottenand Guio, 2016; Celicay and Gumus, 2017).

From our perspective, the subject of research is expenditure and its analysis in selected social policy area in relation to social risks represented by poverty and social exclusion. The paper aims to evaluate social protection expenditure by functions with emphasis on similarities and differences, and in relation to poverty and social exclusion in EU countries. Cluster analysis is applied to analyse eight functions of social protection benefits by similarities and differences, and correlation analysis to test the relation between social protection benefits by functions on the one hand, and income poverty and social exclusion on the other, in the period 2007-2015.

2   Literature review

Poverty and social exclusion is dealt with from a variety of perspectives (Devicienti and Poggi, 2011; Fliegner, 2011). Aaberge and Brandolini (2014) examined different approaches to the measurement of multidimensional inequality and poverty, and Whelan and Maitre (2010) compared poverty indicators in the European Union. Other authors, such as Marlier and Atkinson (2010) or Whelan et al. (2014) focused on multidimensional approaches of the measurement of indicators of poverty and social exclusion. On the regional level, poverty and material deprivation was investigated by Kraftová

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and Duriová (2017), who carried out an interregional comparison of risk of poverty and material deprivation in the conditions of the Czech Republic.

Reduction poverty and social exclusion are often analysed in relation to social expenditure. The evaluation of social protection expenditure in connection to redistribution effects was dealt with by Goudswaard and Caminada (2010) or Wang et al. (2012), who analysed the redistributive effect of social expenditure with focus on public and private social programs and social transfer programs and taxes. Molina-Morales et al. (2013) carried out an analysis of economic and institutional factors influencing, to a greater or lesser degree, social spending in the 27 EU countries. Also Roženský (2014) analysed the level of social expenditure in 30 European countries (EU 27 states, Norway, Iceland and Switzerland) and explaind the development of social expenditure levels in the period 1990-2010.

The impact of social expenditure on income poverty and material deprivation in four EU countries (Germany, Greece, Poland and the United Kingdom) was studied by Notten and Guio (2016). Reducing poverty trough social transfers was investigated Cantillon and Van Mechelen (2013). Study by Caminada et al. (2012) was dedicated to the impact of social expenditure on poverty rate for the period 1985–2005, where demographic and macroeconomic differences across countries were considered. Results of this study verified a negative, but quite a strong correlation between the level of social expenditure and poverty rate. Other authors Caminada and Goudswaard (2012) analysed the relationship between gross total social expenditure and poverty rates across 28 countries (15 EU countries and 13 non-EU countries), in 2003-2007 with the use of regression analysis. Also Dolinová (2015) examined the impact of social security spending of a state on reducing poverty in thirty European countries. The analysis of relations between selected indicators used correlation analysis and subsequent cluster analysis. The relationship between level of social transfers and poverty rate indicate surprising results. In several countries poverty rate has been deepened, even though the level of expenditures on social policy has increased.

Visser et al. (2014) investigated to what extent macro-economic circumstances and social protection expenditure affect economic deprivation. Their results of linear multilevel regression analyses indicate that in countries that perform worse economically, individual experience with economic deprivation is more prevalent, the stronger the rise in the unemployment rate and the lower a country's wealth, the more economic deprivation individuals experience. Van Vliet and Wang (2015) analysed social investment and the distributional effects arrangements in fifteen European countries for the period 1997–2007. Their results suggest that the detrimental effect of social investment policies, in some specific cases, cannot be generalised across a larger group of European countries. However, for European countries other than the Nordic countries, the results provide some evidence for a linkage between stagnating or increasing poverty trends and shifts in expenditure to new welfare state programmes.

3   Methodology and data

For the purposes of the empirical analysis were used data from the Eurostat database for the selected period 2007-2015, with 2007 as the default year and 2015 as the last year when data on all EU countries were available for the analysed variables (*Population and social conditions - social protection:* expenditure on social protection, social benefits by functions, *Europe 2020 indicators – poverty and social exclusion:* the at-risk-of-poverty rate, people at risk of poverty or social exclusion).

Expenditure on social protection is divided into four categories. The first one is expenditure on social benefits, which are resources in the form of cash, products or services. The second category relates to administrative expenses, connected with the system of the provision of social protection. The third and fourth category deal with transfers into other systems and various expenditure. ESSPROS defines social protection as encompassing all interventions from public or private bodies intended to relieve households and individuals of the burden of a defined set of risks or needs, defined through eight functions of social protection: sickness/health care (sick/health), disability (disa), old

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age (old), survivors (surviv), family/children (fam), unemployment (unemploy), housing (house), social exclusion not elsewhere classified (exclu) (Eurostat, 2012; Eurostat, 2018a, 2018b).

The object of the quantitative analysis is a set of 28 EU Member States, comprising: Belgium (BE), Bulgaria (BG), the Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), France (FR), Croatia (HR), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), the Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI), Sweden (SE), the United Kingdom (UK).

Key methods of the scientific paper are analysis, comparison and abstraction, in creation of the theoretical framework and the review of literature, content analysis and synthesis and partial induction in drawing conclusions are used. **The correlation analysis** (the Pearson's correlation coefficient) was applied to test correlations of the observed variables - social benefits by functions: 1) sickness, healthcare and disability, 2) old age and survivors, 3) family and children, 4) unemployment, housing and social exclusion) in the period 2007-2015 for the following cluster analysis. The correlation analysis was applied also in statistical testing of the relation between the social benefits by functions on one side, and income poverty (evaluated by the at-risk-of-poverty rate-APOP) and social exclusion (evaluated by the people at risk of poverty or social exclusion-APOPE) on the other. This method is used to measure the strength of linear correlation between two random variables. Values range within the interval $<-1, 1>$; where the positive or negative value indicates the direction of correlation (positive in the case of correlation, negative in the case of anti-correlation) and its absolute value indicates the strength of correlation (Lynch, 2013). The analysis of similarities and differences between EU countries by functions of social benefits was performed through **cluster analysis**. Cluster analysis is a multi-dimensional statistical method used for classification of objects. It sorts units (EU member states the present example) into groups (clusters) so that units belonging in the same group are more similar then objects from other groups. Hierarchic clustering was applied, which brings about a multitude of alternative solutions how to cluster objects on the basis of their distance or similarity, its outcome can be expressed by means of a dendrogram (Garson, 2014). In this paper, the furthest neighbour method (the determining factor is the maximum distance between objects) was applied. The distances of objects are measured by squared Euclidean distance (Řezanková et al., 2009). A dendrogram indicates that the larger the size on the horizontal axis (x), the less similar, in the present case, the EU countries are. Conversely the smaller the distance on the x axis, the larger the similarity between countries. Box plot is one way of visualizing numerical data by means of their quartiles. The middle "box" part of the diagram is delineated by the third quartile from the top, and the first quartile from the bottom, whilst the mean is expressed by a line in-between. Box plots can also contain lines beginning in the middle part of the diagram vertically up and down, the so-called whiskers, which express variability of data below the first and above the third quartile (Pavlík, 2005). Cluster analysis was applied for example in papers by Melecký and Staníčková (2014); Majerová and Nevima (2016) or Drastichová (2018), which evaluates selected indicators of the sustainable development, but the special focus is on the crucial indicators in the social pillar.

The calculations in the following part are the output of the SPSS Statistics 24.0 software.

4   Empirical results and discussion

In EU countries in the period 2007-2015 is 1) evaluated the development of expenditure on social protection, 2) performed the analysis of social benefits by functions according to similarities and differences, 3) tested the relation between social benefits by functions and income poverty and social exclusion.

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4.1   Trend of Expenditure on social protection in EU in the period 2007-2014

The development of expenditure on social protection in the EU27 in the period 2007-2014 is shown in the left axis, where between 2008 and 2009 the EU27 showed a significant growth in expenditure on social protection in terms of percentage of GDP. This growth is related to the economic crisis connected with a decrease in GDP and GDP per capita. The extent of changes in GDP per capita and rate of changes in expenditure is captured in the right axis Fig. 1.
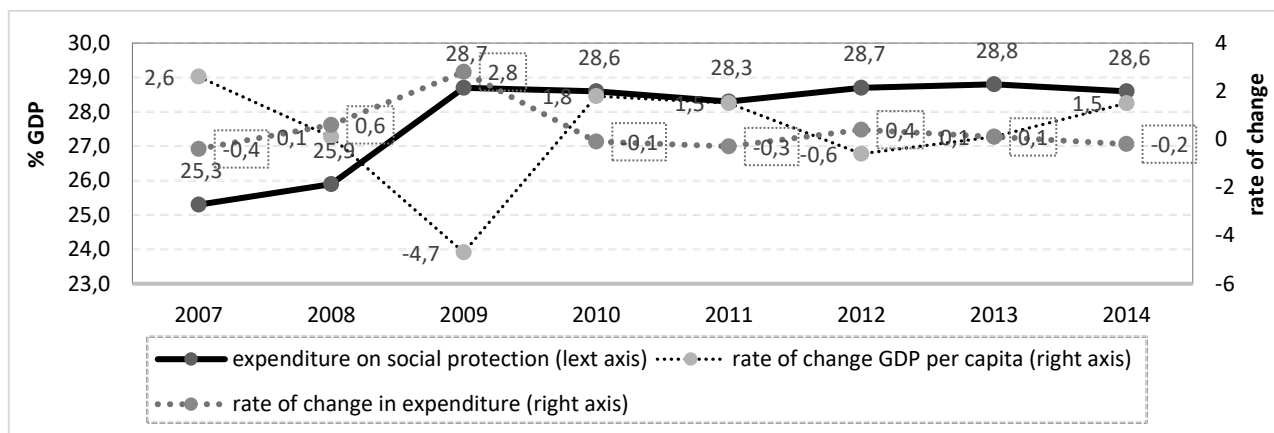
Fig. 1. Expenditure on social protection as a percentage of GDP, rates of change in expenditure and GDP per capita, EU-27 (note: 2014 last available year for EU-27); (Source: Author according to Eurostat)

In connection with the development and trends of expenditure on social protection, Bontout and Lokajičková (2013) reviewed social protection expenditure developments in the crisis, focusing on expenditure trends in volumes following the peak of the crisis (2009), on changes in the distribution of incomes and, notably, on the distributional impact of austerity packages. Also Sucur (2016) examined the role of social protection and social expenditure in the financial and economic crises and analysed the trends in social expenditure developments in EU countries since the beginning of the last economic crisis (2008). His results confirmed that social protection expenditure has increased in almost all EU countries since the beginning of the crisis and that in the crisis most countries rely on redistributive effects of the so-called automatic stabilisers.

4.2   Similarities and differences EU Countries by social protection benefits by functions in the period 2007-2015 – results of cluster analysis

Applying the method of cluster analysis and box-plot, 28 EU countries are analyzed regarding social protection benefits by selected functions (1) sickness/healthcare and disability, 2) old age and survivors, 3) family and children, 4) unemployment, housing and social exclusion) in period 2007-2015 as average. The 28 EU countries by the evaluated functions of social protection benefits are seen in Figure 2. The dendrogram (Fig. 2a) shows the results of the cluster analysis, and the box-plot (Fig. 2b) presents the division of countries into four clusters by similarity (dissimilarity) of the evaluated functions of social benefits.

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a) **Dendrogram**   b) **box-plot**

Fig. 2. Dendrogram and box-plot of EU countries by social benefits in 2007-2015 (Source: Author)

The first cluster is composed of 9 countries, BE, DK, DE, ES, FI, FR, NL, SE, UK. The highest internal similarity in social protection benefits by functions is seen between FI and SE, as well as FI and DE, DK and FR. A lower similarity in social protection benefit is seen in UK and NL, BE and ES. The countries are characterised by the highest social benefits on sickness/healthcare and disability and a relatively high representation of social benefits on old age and survivors. Countries in the first cluster also have the highest representation of social benefits on unemployment, housing an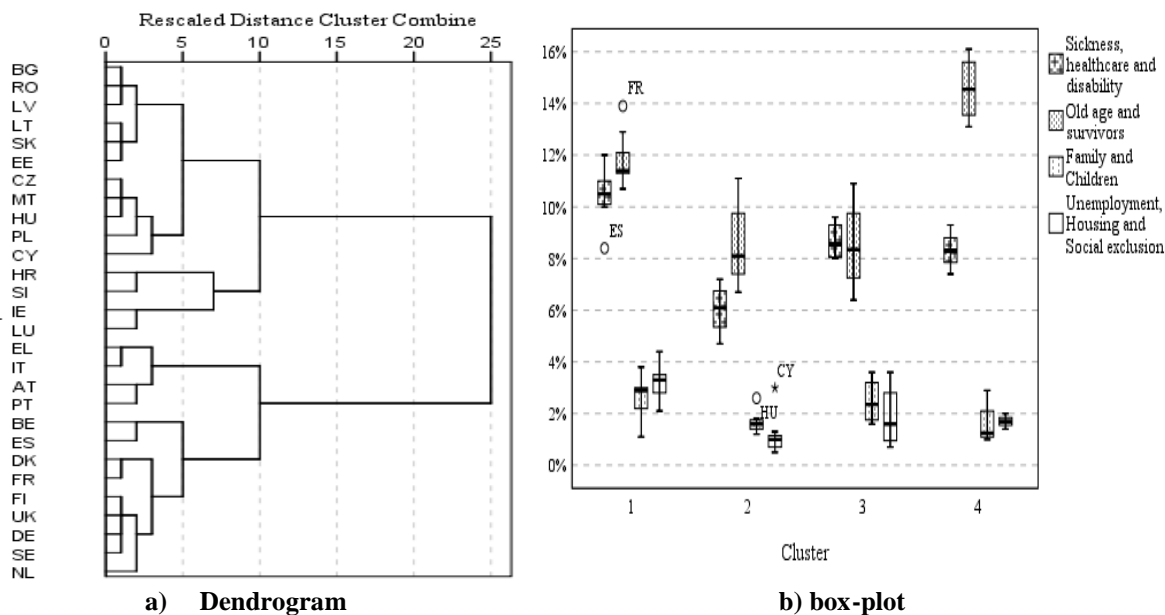d social exclusion (median of 3.3% GDP) and social benefits on family and children (median of 2.9% GDP) compared to the remaining EU countries. As regards social benefits on sickness/healthcare and disability (ES) and pro social benefits on old age and survivors (FR), these represent an outlier (indicated by the circle), that is found between the 1.5 and 3 quartile range from the end of the box.

The second cluster is composed of 11 countries (BG, CY, CZ, EE, HU, LV, LT, MT, PL, RO, SK). The highest internal similarity by social protection benefit is seen in BG and LV, LT and EE, CZ and HU. A lower similarity in RO and SK, and MT and PL. These countries are characterised by the lowest representation of social protection benefits by functions. In the structure of social benefits by functions prevail benefits on old age and survivors, sickness/healthcare and disability. Countries in the second cluster are characterised by the lowest social benefits on unemployment, housing and social exclusion in comparison to the remaining EU countries. The largest dispersion of values is seen in social benefits on old age and survivors (% of GDP), from 6.7 in EE to 11.1 in PL. In case of social benefits on family/children, HU is an outlier (indicated by the circle) and CY reaches for social benefits on unemployment, housing and social exclusion an extreme value (indicated by an asterisk) is higher than 3 quartile range from the end of the box.

The third cluster is composed of IE, HR, LU, SI, where the highest similarity in social protection benefits by functions is seen in HR and SI, IE and LU. In the structure of social benefits prevail benefits on sickness/healthcare and disability and benefits on old age and survivors. The countries are characterised by lower social benefits on old age and survivors, but higher social benefits on family and children (median of 2.4% GDP) compared to the other EU countries. The largest dispersion of values is seen in social benefits on old age and survivors (% GDP) from 6.4 in IE to 10.9 in SI.

The fourth cluster consists of EL, IT, AT, PT. The highest internal similarity in social protection benefits by functions is seen in EL and IT, lower is seen in AT and PT. In the structure of social benefits, benefits on old age and survivors prevail. These countries are characterised by the highest

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social benefits on old age and survivors (median of 14.6% GDP) and dispersion of values from 13.1 in PT to 16.1 in IT, but the lowest social benefits on family and children (median of 1.3% GDP).

Table 1. Median of social protection benefits by selected function in clusters EU Countries in the period 2007-2015

Country / median of benefits (% GDP)	sick/health + disa	old+ surviv	fam	unemploy, house + exclu
cluster 1	10.5	11.4	2.9	3.3
cluster 2	6.1	8.1	1.6	1.0
cluster 3	8.6	8.4	2.4	1.6
cluster 4	8.3	14.6	1.3	1.7

Source: Author

When comparing EU countries by similarity (dissimilarity) of the extent and structure of social protection benefits by functions, it can be said that based on the median values (Table 1), countries in the second and third cluster are among the most similar by social benefits on old age and survivors, and countries in the third and fourth cluster by social benefits on sickness/healthcare and disability an and by commonly evaluated social benefits on unemployment, housing and social exclusion. By contrast, the largest differences (dissimilarities) are seen in the countries in the second and fourth cluster by social benefits on old age and survivors, and countries in the first and second cluster by social benefits on sickness/healthcare and disability and benefits on old age and survivors. Mossuti and Asero (2012) argue that differences between countries' expenditure levels partly reflect diverse levels of wealth, but also diversity in social protection systems, welfare policy, demographic trends, unemployment rates and other social, institutional and economic factors and specificities of each country.

4.3 Relation between social protection benefits by functions, income poverty and social exclusion in EU countries in the period 2007-2015

In EU countries in the period 2007-2015, as the average, is, by means of correlation analysis (the Pearson's correlation coefficient), statistically tested the relation between social protection benefits by functions on one side and income poverty (evaluated by risk of poverty rate - APOP) and social exclusion (evaluated by people at risk of poverty or social exclusion - APOPE) on the other.

The results of the correlation analysis (table 2) showed statistically significant moderate negative correlation between social benefits (all functions) and income poverty ($p < 0.05$) and between social benefits (all functions) and social exclusion ($p < 0.01$). Statistically significant moderate negative correlation was also found between social benefits in the selected areas of social protection (sickness/healthcare, family/children, housing and social exclusion) and income poverty, and between social benefits by functions (sickness/healthcare, housing and social exclusion, disability, family/children) and social exclusion. On the contrary, only a weak negative correlation was found between social protection benefits on old age and unemployment in connection to income poverty and social exclusion (see Table 2).

Table 2. Relation social protection benefits, income poverty and social exclusion in EU countries in 2007-2015

	social benefits all func.	sick/ health	disa	old	surviv	fam	un-employ	house, exclu
APOP	-0.421[*]	-0.483[**]	-0.313	-0.173	-0.001	-0.445[*]	-0.168	-0.514[**]
APOPE	-0.584[**]	-0.615[**]	-0.441[*]	-0.302	-0.134	-0.431[*]	-0.306	-0.460[*]

** Correlation is significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2-tailed).

Source: Author

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It can be said that previously carried out research reached similar results (e.g. Caminada et al., 2012; Caminada and Goudswaard, 2012; Notten and Guio, 2016). In particular, Caminada and Goudswaard (2012), who investigated the relationship between gross total social expenditures and poverty rates across 28 countries (15 EU countries and 13 non-EU countries), in 2003-2007 with the use of regression analysis, found a strong negative relationship between the level of gross public social expenditures and poverty. Countries with higher gross public social expenditure ratios tend to have lower poverty rates than countries with lower expenditure ratios. Furthermore, the results also confirmed that correlation is less strong in EU countries compared to non-EU countries. Notten and Guio (2016) analysed the impact of social expenditure on income poverty and material deprivation in four selected EU countries. Their results showed that income transfers can not only reduce income poverty but they can also substantially reduce the extent and depth of material deprivation.

5   Conclusion

Economic and social policy mutually initiate, determine and stimulate. In tackling social risks, such as poverty and social exclusion, social policy in EU countries stems from the economic potential of countries, national systems of social protection and the extent of processes of redistribution defined by the volume of social protection expenditures. The paper aimed to evaluate social protection expenditure by functions with emphasis on similarities and differences and in relation to poverty and social exclusion in EU countries. The research analysed the period 2007-2015 using cluster and correlation analysis for a selected set of 28 EU countries.

The results from cluster analysis showed a similar structure, but also marked differences in social benefits by functions. Among the most similar are countries in the second and third cluster by social benefits on old age and survivors, and countries in the third and fourth cluster by social benefits on sickness/healthcare and disability. By contrast, the largest differences in the structure of social benefits appeared between countries in the second and fourth cluster (by social benefits on old age and survivors), and the countries in the first and second cluster by social benefits on sickness/healthcare and disability, and benefits on old age and survivors. Using correlation analysis (Pearson's correlation coefficient), the relation between social protection benefits by functions and income poverty and social exclusion was statistically tested. The results showed a moderate negative relation between social benefits (all functions) and by selected functions (sickness/healthcare, family/children, housing and social exclusion) and income poverty and social exclusion. The topic for further research can also be the impact of selected categories of general government expenditure (social protection, health, education, housing) on poverty and social exclusion.

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INNOVATION IN THE ENTREPRENEURIAL EDUCATION ON THE EUROPEAN LEVEL – EXPERIENCES ACQUIRED IN AN INTERNATIONAL PROJECT ECMT+

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Abstract
One of the much-debated topics of educational policy in the European Union is entrepreneurial education. According to the European Union directives, the entrepreneurial learning should develop business knowledge and essential skills and attitudes including creativity, initiative, tenacity, teamwork, understanding of risk and a sense of responsibility. The goal of the paper is to evaluate innovative methods in teaching business on European level from students´ perspective using the example of the international cooperation within Erasmus+ programme. The article tackles an international project which significantly contributes to the development of entrepreneurial, intercultural and communicative competence. The main result of the project should be modernised higher education, which supports graduate employability and entrepreneurship. The evaluation of innovative teaching methods will be based on the students self-reflective journals and essays. Self-reflective essays may challenge students to think critically about what they are doing well and what needs to be changed as a result of the described experience.

Keywords
Educational Policy, Entrepreneurship Education, Intercultural Communication, Teaching Methods.

JEL classification
I23, I25, M13

1   Introduction

The process of European integration and economic development affect changing forms of the EU educational policy. The emphasis on education was declared at the beginning of European integration. The nature of educational systems remained in the competence of national states for a long time. The common educational policy has been significantly developed on the European Community level since the 1980s. At that time, the first common educational programmes were commenced. Fist educational program was Comett programme for cooperation between universities and enterprises. In 1980, Eurydice was established as a network of education and information to collect and spread reliable information in Europe about education systems and policies. The influence of the EU on education increased after signing further integration agreements. The European Union member countries are still responsible for its education systems; the role of the EU is supportive and coordinating. Cooperation in educational policy develops in the framework of the forum Education and training 2020 (ET 2020). In 2009, this forum declared four common EU goals: "Making lifelong learning and mobility a reality, improving the quality and efficiency of education and training, promoting equity, social cohesion, and active citizenship, enhancing creativity and innovation, including entrepreneurship, at all levels of education and training" (Strategic framework – Education & Training 2020).

Also the impacts of economic development contributed to the fact that one of priorities of the European educational policy became the support of entrepreneurship. The development of common educational programmes was connected with the EU economic policy even on this level.

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Recommendation of the European Parliament and of the Council from 2006 defined one of the key competences the sense of initiative and entrepreneurship, which should include „creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives". (Recommendation of the European Parliament and of the Council, 2006). Erasmus+ Programme, which was performed in 2007-2013 under the framework of Lifelong Learning Programmes, mentions increased sense of initiative and entrepreneurship as one supported outcome of the learning mobility (Erasmus+ Programme Guide, 2018). Approaches to the business education in Europe are different. For example, the Czech Republic belongs to the countries with no official definition of entrepreneurship education. (Eurydice Report, 2016) For Entrepreneurial Education in the Czech Republic, there is also still typical dominance of the traditional teaching methods – lectures and seminars (Procházková, 2015). The need to implement new educational methods is emphasized in documents of European institutions. The European Commission in the area of entrepreneurial education recommends "experiential learning and breaking down the more traditional hierarchies between teachers and students so that the teacher becomes more of coach and/or moderator." (Building Entrepreneurial Mindsets and Skills in the EU, 2012). Also European Entrepreneurship Action Plan 2020 emphasizes, that "education should be brought to life through practical experiential learning models and experience of real-world entrepreneurs" (Entrepreneurship Action Plan 2020, 2013).

Such trends are also developed in international projects within the Erasmus+ programme. The success rate related to enforcing of the new methods in entrepreneurial education as part of the European educational policy can be demonstrated on the example of a particular international project. The following article presents the views of students who participated in the International Project Entrepreneurship and Communication in Multicultural Teams (ECMT+) within Erasmus+. The main goal of the project is promotion of business education realized during common English workshops for students developing knowledge and skills in the area of management, marketing, communication, etc., using innovative teaching methods like for example case studies, critical incidents, and other interactive methods of teaching (Heinz and Orszulik, 2014). The main result of the project should be modernised higher education, which supports graduate employability and entrepreneurship. Partners in the project are Karelia University of Applied Sciences, Joensuu (Finland), Technische Hochschule, Wildau (Germany), Institute of Technology Roanne, Jean Monnet University, Saint Etienne (France), University of the West of Scotland, Paisley (UK), VIVES University College, Kortrjik (Belgium), Politechnika Poznanska, Poznan (Poland), and Silesian University, School of Business Administration Karvina (Czech Republic). The project involves a broader community of students and teachers from various European countries who will be able to use the course related output, which will definitely contribute to interconnecting of the theoretical and practical levels of business education. The outcomes of the project should be joint modules and resource package, accessible for bi -and multilateral use, intensive courses, book for the Community of practice and research publications. Key component of the project are two-week intensive programs that take place once a year at a selected partner university. The second Intensive Program (IP) was held in Wildau, Germany. Students take part in thematic workshops and prepare their own business plans in international teams. Each of the aforementioned universities chose six students, who then formed nine international teams according to the business ideas they wanted to work on. Students in the first week of the IP could develop their own business idea in the multicultural team and verify it on potential customers in Berlin. In the second week, they were able to further develop it using the Lean Canvas model and a detailed financial and marketing strategy. The culmination of the second week was the pitching of all teams in front of a commission composed of German start-upists and coaches from across Europe.

The presented feedback is related to students´ teams affiliated to four following higher education institutions: Karelia University of Applied Sciences, Joensuu (Finland), Technische Hochschule,

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Wildau (Germany), VIVES University College, Kortrjik (Belgium), and School of Business Administration in Karviná, Silesian University in Opava.

2   Literature review

Changes in the EU educational policy and entrepreneurial education are the subject of many publications and scientific articles. EU presents history of European educational policy in official publication (The history of European cooperation in education and training, 2006). Cankaya et al. (2015) reminds that the progress of educational policy in the EU is related to the economic crises and its consequences. How McMurtry (2013) shows, European Commission in 2006 included the entrepreneurship in the key competences for lifelong learning. But the interest in entrepreneurship and education has much longer tradition. Chosen articles represent various approaches to the entrepreneurial education. Kuratko (2005) analyses history, current state of entrepreneurial education and its future challenges.

Raposo and do Paço (2011) brings the basic overview of main research lines in the area of entrepreneurial education. Current trends in entrepreneurial education are mapped by Procházková (2016), who primarily deals with entrepreneurship education approaches at selected universities in the Visegrad Group countries. She also presents several examples of good practice from USA and Finland, which can be used as an inspiration especially for universities in the post-communist regions. Welsh et al. (2016) mention specifics of entrepreneurial education and emphasis the importance of the evaluation of the teaching effectivity. Čapiené and Ragauskaité (2017) remind the gap between teaching methods and students in the entrepreneurship education and recommend cooperation with successful entrepreneurs as one the way to improving entrepreneurship teaching model.

3   Methodology and data

The analysis of innovative methods of entrepreneurial education during the intensive program is based on the student´s self-reflective essays. Using reflective learning practices as part of reflective learning methodology has become a very effective way of students´ reflection on their learning experiences and making them engaged in the learning process. Reflective techniques shows how students perceive what they are learning and how they connect the new knowledge to the old one and what their attitude to that they are learning is (Zelenková, 2016). One of the reflective methods involve a self-reflective essay which is a brief paper where students describe an experience and how it has changed them or helped them to grow. Self-reflective essays often require students to reflect on their academic growth from specific projects or assignments, though others might require thinking about the impact of a specific event in your life. Self-reflective essays´ goal is to reflect on writers´ academic growth acquired in the mentioned projects and their impact on participants´ lives by describing overall experience, discussing current strengths and weaknesses, and sharing future plans for using acquired knowledge and skills in the area of entrepreneurship. Self-reflective essays could serve as a valuable feedback for teachers, who can rethink their methods and teaching strategies (Frydrychová Klímová 2014).

The IP held in Wildau in February and March 2018 involved two weeks of working together both of students and teachers from seven different institutions and different disciplines in order to develop their entrepreneurial communication skills while working in multicultural workgroups on international start-ups. The project was aimed at providing a hands-on experience over a ten-day period to enable all the participants to develop and reflect on the necessary skills and strategies to achieve effective intercultural communication, using case studies, critical incidents, educational games and other innovative teaching methods. At the same time, participants of the course received input from teachers and practitioners from various backgrounds, who encouraged them to adopt a wide range of approaches suitable for completing their projects and to acquire adequate ways of presenting it to potential investors.

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The participants of the course were obliged to answer several questions related to their feedback so that the evaluators were able to process valuable information and incorporate it into the next IP preparation as well as into the online syllabi presenting one part of the project dissemination, and other activities related to the project output. Students were recommended to write 1 000 words and deliver their works to their coordinators after the IP course had finished.

The respondents were given instructions on how to complete a self-reflective diary and they were asked to follow the fixed structure of the document. The article focuses especially on answers provided in questions related to new methods of entrepreneurial education:

- What new teaching methods have you experienced in entrepreneurial and intrapreneurial approaches and how have they changed during team working?
- Did you change your entrepreneurial idea? If yes, how? What did you abandon? What was reinforced?

The analysis is related to the feedback provided by the Czech, German, Finnish, and Belgian teams of students.

4   Evaluation of students´ self-reflective essays

The following evaluation involves teams of students coming from 4 project partner universities, the Czech Republic, in Germany Finland, and Belgium. Although opinions expressed by students have varied in a number of points, generally all the surveyed students have agreed that the ECMT IP course was a significant contribution to the development of their entrepreneurial knowledge and skills, and especially to professional networking.

4.1   Evaluation of the Czech team´s feedback

Czech students were amazed at a different environment and equipment at Technische Hochschule in Wildau, suitable for creative working on projects, which in their opinion reflects economic differences between the Czech Republic and Germany. As potential entrepreneurs students have been able to learn that working on start-ups means hard working people, a risk, and a good luck as well. They have also come to the conclusion that business planning and validation of ideas is crucial when working on a start-up.

Czech students have highly appreciated an opportunity to acquire information from tutors through teaching the Lean Start-up, the Pretotyping and Prototyping, and the Business Canvas Model, the Persona, the Brainstorming Method, and the Six Hats, which seem to be very useful for their future work as it is closely interconnected with practice. Participants of the IP course were recommended to use the mentioned methods in their own start-ups.

The Czech students have stated that their business ideas changed several times during the course, in some cases teams even abandoned the original business ideas and adopted other ones, very often under the influence of a new coach. Generally, changing of coaches has been criticized by all the respondents as teams were missing a single direction and team members felt puzzled by different approaches.

However, Czech students feel that they have developed their skills related to entrepreneurship a lot and they were able to get to know themselves in terms of their potential to cooperate in multicultural teams, but especially they could experience how much they were able to concentrate on work and react in stressful moments.

4.2   Evaluation of the German team´s feedback

German students in their very detailed self-reflection have stated that the IP gave them an insight into the knowledge about entrepreneurship. They have mentioned useful strategies related to creating a business, various marketing and business strategies, and business models they were presented with.

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They have expressed their positive opinions about an interactive way of teaching, which seems to be goal leading.

Setting milestones is considered to be a very good idea as they helped team members to show what different tasks had to be done to pitch the business idea in a successful way. Most of students´ attention focused on problems related to developing the start-up ideas in the teams as they had to filter the acquired information and prepare the final pitch. They also appreciated information about start-up failures. Some students have become aware of the fact that they underestimated the process of building a business and they were working on a product that had already existed before, which led to losing a lot of time as the business idea had to be abandoned.

German students have admitted that they have gained a new perception of business especially in terms of overtaking responsibilities in a team as well as creating hierarchy that can be established more naturally during the process of team working when the whole potential of team members can be revealed.

The students have agreed that it is very valuable to know how much work it is to build up a business, how hard it is to calculate, to make a business plan, to interview people, but it is also very difficult to be creative for two weeks. The IP experience has opened students´ eyes about what it is means to be an entrepreneur and how hard it is to run a business.

4.3   Evaluation of the Finnish team´s feedback

As Finland belongs to the countries with the innovative tertiary education, students from Finland, including the Asian ones, have not been surprised at using innovative methods of teaching business. There have been more critical remarks and strong recommendations related to the organization and content of the course, but in case of Asian students they have been expressed in an implicit way.

Some members of the Finnish team have realized that teaching styles vary a lot among the universities involved in the project and they have also been critical to the level of coaching. The Finish students consider making Pretotypes and Prototypes of a Business idea and testing it afterwards with a potential customer the most exciting and challenging part of the project. They also appreciate the study trip to Berlin which helped to improve the team spirit and brought new information about potential customers, and find using business models like the Canvas Model and the Six Hats crucial for developing a start-up. A lot of attention has been devoted to the Lean Start-up as students were taught that testing was necessary in every phase of the product development.

The students have reported that the business ideas due to the lack of consensus sometimes returned to the beginning and the only solution was to proceed with the pitch preparation to meet the deadline or the team members had to reduce working on some aspects of the start-up implementing only its parts by voting.

4.4   Evaluation of the Belgian team´s feedback

Belgian students have reported in excellent English that the organization and content of the project need improving. Nevertheless, it was an interesting experience for them to work on a product or service from the initial idea until the pitch inform of investors.

They appreciated the idea of workshops combined with the practicality of the start-ups and some of them feel that it was only an introduction to the topic. The tutors who presented both practical and theoretical approaches gave their personal and cultural touch when they were teaching new entrepreneurial insights. The Belgian liked the course on pretotyping and prototyping very much, but they would be happy to have more time for team working. Ice-breakers leading to team formation have also been highly evaluated as very original.

The coaches seemed to be very helpful at first, but became disinterested in the second week, which made working on a start-up more and more difficult, so teams often ended up with their original ideas.

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5   Conclusion

Having evaluated responses submitted by Czech, German, Belgian, and Finnish students, it can be stated that the Czech students have made the biggest progress in numerous aspects of the business idea development as they had not had many opportunities to participate in similar European programmes before. Finnish, German, and Belgian students had been offered more courses focusing on start-ups and relating to communicative and intercultural skills. Consequently, Czech students perceived teaching methods and business models implemented during the IP course as very useful. Respondents have realized that teaching styles vary a lot among the universities involved in the project and majority of them has been critical to the level of coaching, especially to changing of the coaches during the IP, which as a result led to frequent changes of business ideas. The students have reported that teams often returned to the initial idea at the end of the IP course and did not have time enough for the pitch preparation.

The analysis of students' reflections shows several unsurprising differences when experiencing different forms of entrepreneurial education. Despite these differences, the vast majority of students appreciated the overall concept of the intensive programme, the contribution of individual workshops and, above all, the possibility to work in international teams on their own business plans. Students' partial critical remarks show that the basic prerequisite for successful international cooperation in the field of entrepreneurial education is thorough staffing and sophisticated organization of intensive programmes. Innovative education requires not only active students, but also motivated and competent lecturers. However, almost all the respondents advise participating in the IP in the future as it presents a hands-on experience in international environment.

6   Acknowledgement

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THE RISKS ASSOCIATED WITH THE "DANISH SCENARIO" FOR THE PARTICIPATION OF THE CZECH KORUNA IN THE ERM II

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Abstract
The strategy for the adoption of the euro in the Czech Republic involves the entry of the Czech koruna into the ERM II mechanism for only the essential amount of time (approximately 2½ years). No date has yet been set for the introduction of the euro. The situation may, however, arise where it will be desirable to introduce the euro as soon as possible. It would therefore be advisable to enter ERM II even without a set date for the introduction of the euro (a so-called "technical entry" to ERM II; "the Danish scenario" for entry). However, participation in the ERM II mechanism means fixing the exchange rate, which is associated with the risk of speculative attacks. The aim of this paper is to assess the experiences of those countries, whose currencies have been in ERM II for a longer period of time. The currency exchange rates of Denmark, Lithuania, Latvia and Estonia were stable at the time of their participation in ERM II, even in the crisis years of 2007-2009. The exchange rate stability criterion would be met in its hypothetical assessment. The key condition for this stability is the conviction of the participants in the foreign exchange markets with regard to the determination of the central bank to keep the exchange rate within ERM II and sufficiently high foreign exchange reserves of the central bank.

Keywords
Currency crisis, ERM II, Euro area enlargement, Exchange rate.

JEL classification
F31, F 33, F 36

1   Introduction

When acceding to the EU, the Czech Republic undertook to replace the Czech koruna with the euro sooner or later. The entry into the euro area has been repeatedly deferred without a specific date being set since 2006, when the deadline for the introduction of the euro in 2010 was withdrawn. The introduction of the euro is conditional, amongst other things, upon the fulfilment of the *exchange rate stability criterion*, the basic part of which involves a period of at least two years spent within the ERM II mechanism. *The Czech Republic's Euro Area Accession Strategy* (CNB, 2003b, p. 3) designates the shortest possible period for remaining in the ERM II mechanism due to the "risk of currency turbulence" (i.e. the risk of a currency crisis). This position has been set out in more detail in the Czech National Bank's study, *ERM II and the Exchange-rate Conversion Criterion* (CNB, 2003a, pp. 4, 6): "The ERM II […] is a fixed exchange rate regime. […] In a world of massive capital flows [participation in ERM II] may be associated with potential costs as the financial markets 'test' the willingness of the authorities to maintain the exchange rate within the fluctuation band".

Circumstances may, however, arise which will lead to an interest in the fast accession of the country to the euro area, in particular:

- domestic circumstances in the form of increased pressure from firms for the introduction of the euro,
- international circumstances in the form of the division of the euro area from the remainder of the EU.

The *entry of the Czech koruna into ERM II without the designation of a deadline for the adoption of the euro* would therefore help in the fast introduction of the euro. The study *Česká republika a eurozóna (The Czech Republic and the euro area)* (2017) designates this entry into ERM II as a "technical entry". At present, only Denmark has its currency in ERM II. This membership in ERM II is therefore in this study called the *"Danish scenario"*.

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In addition to simplifying the entry into the euro area, the inclusion of the Czech koruna in ERM II would also have other favourable impacts, such as:

- it would confirm the Czech commitment to adopting the single European currency, which would enable the Czech economy to strengthen its credibility,
- it would strengthen the country's position when cooperating with the euro area, for example participation at certain euro area summits or access to certain information.

The aim of this paper is to evaluate the experience of currencies which have entered ERM II for a period which is longer than the essential two-year period (plus a further period, caused by the gap between the country's rating and the introduction of the euro). What are the experiences of those currencies which have entered ERM II for a longer period than the minimum required period? Did speculative pressures on the exchange rate appear for these currencies? If they did, was it possible to maintain the exchange rate in ERM II? Has the exchange rate convergence criterion been met in this longer period?It is possible to use the experience of the entry of these currencies into ERM II to look for analogies for the application of the "Danish scenario" in the case of the Czech koruna.

2   Literature review

A number of studies include general evaluations of the risks associated with *the entry of a national currency into ERM II*. For example, Dyson (2006), Michalczyk (2011), Backé et al. (2004), Palankai (2015) and De Grauwe (2016).[1]. All of them mention the risk of speculative attacks. Of the Czech authors in this area especially Sychra (2009) points to "potential instability" during the period of inclusion in ERM II. Marková (2011) expresses similar sentiments.

For example, Lacina et al. (2008), Lacina, Rozmahel et al. (2010) or Helísek and Mentlík (2018) all draw attention to the same risk *for the Czech koruna* when entering ERM II. Fassmann and Ungerman (2018) point to the risk of the untenable appreciation of the exchange rate. However, none of these works has dealt with the risks associated with the long term inclusion of the currency in the ERM II (either at a general level or in the specific case of the Czech koruna).

As far as the experience of the entry of the *Danish krone (DKK) into ERM II* is concerned, we have especially used Spange and Wagner Toftdahl's (2014) study, which evaluates this entry as being problem-free (see below). Dědek (2014) includes an independent subchapter dedicated to the entry of Denmark into the currency integration without a detailed evaluation of the DKK in ERM II. *Česká republika a eurozóna (The Czech Republic and the euro area)* (2017) explicitly deals with the "Danish scenario" and its possible application to the Czech koruna. However, the possible risks associated with a long-term entry into ERM II are not analysed there.

3   Methodology and data

The Danish krone is currently the only currency in ERM II. We will also investigate the currencies of the three Baltic countries, which remained in ERM II for a relatively long period. Other countries have employed a strategy of remaining in ERM II for the shortest possible time (similarly to the Czech Republic), and as such we will not investigate the currencies of these countries. Specifically:

- Slovakia – the Slovak koruna was in ERM II for 37 months,
- Greece – the Greek drachma went from ERM to ERM II, where it lasted for 24 months,
- Slovenia – the Slovenian tolar was in ERM II only for 30 months (at the time of the evaluation, it had only been in ERM II for 22 months, similarly to Lithuania – see below)
- Cyprus and Malta – the Cyprus pound and the Maltese lira were involved in ERM II for 32 months.

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[1] "It may then face similar problems to those the EMS experienced in 1992-1993 with speculative crises and a collapse of the arrangement." (De Grauwe, 2016, p. 155).

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On average, the currencies of these countries remained in ERM II for 29 months.

Our research includes an analysis of the development of the nominal exchange rates of the four aforementioned currencies in relation to the euro from the point of view of the fulfilment of the *exchange rate stability criterion* (one of the Maastricht convergence criteria). In addition, we will evaluate not only the *development of the exchange rate*, but also the indicators of so-called *severe tension* in relation to:

- the development of official international reserves,
- the development of the interest rates differential expressed as the difference between the national interbank interest rates and the EURIBOR rate.

All of the data has come from the statistical databases of the national central banks and the European Central Bank.

4 Currencies with long-term participation in ERM II

This session explains the development of currencies of Danish krone and Baltic states in ERM II system.

4.1 The Danish krone in ERM II

The Danish krone entered the ERM exchange rate mechanism (the main part of the European Monetary System) at the time of its establishment, i.e. in March 1979. This system originally set mutual central parities (naturally, these were often modified[2]) between the participating currencies with admissible deviations of ± 2.25% or even ± 6% in the case of some currencies (especially in countries with higher inflation). Whenever these margins were reached, the central banks in both countries were required to carry out an intervention in the foreign exchange markets with the aim of maintaining the exchange rate within the fluctuation band. After crises occurred in a number of the currencies included in the ERM (1992-93), the fluctuation band was expanded to ±15% at the beginning of August 1993. Despite this, however, Denmark voluntarily kept the original fluctuation interval of ± 2.25%. According to the Danish Central Bank, the reason is: "This policy has provided a solid anchor for low and stable inflation expectations in Denmark." (National Bank of Danemark, 2018)

The establishment of the euro and the European Central Bank at the beginning of 1999 meant the winding up of the European Monetary System and the original ERM. As such, ERM II was established. There, the central parity of the national currencies was designated in relation to the euro, while the so-called normal fluctuation band, which was usually (but not always) interpreted as ± 15%, was maintained. The obligation to intervene if the margins of the fluctuation band were reached was kept in place.

After reaching an agreement with the ECB, Denmark continued to use the aforementioned ±2.25% fluctuation band. In doing so, it therefore voluntarily set an almost fixed exchange rate to the euro, despite the fact that it had negotiated a so-called permanent opt out from introducing the euro (together with Great Britain) in the Maastricht Treaty.[3] The maintenance of an almost fixed exchange rate means the waiving of the option of using the exchange rate as an economic policy tool, especially to influence competitiveness in relation to foreign countries. The same applies to interest rates which have to conform to the rates in the euro area, because international movements of capital would endanger the stability of the exchange rate in the case of any significant differences in interest rates. Such an economy can be designated as a "shadow member of the euro area [...] without the right to

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[2] The Danish krone initially devalued three times in this mechanism, then also revaluing three times (Helísek, 2004, p. 44).

[3] The rejection of the euro was the result of two referenda, in June 1992 (the rejection of the Maastricht Treaty) and in May 1993 (the acceptance of the Maastricht Treaty with an opt-out on the obligation to adopt the euro). The euro was once again rejected in a referendum in September 2000 (Dědek, 2014, p. 165).

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decide on the joint currency's policies, but with the obligation to adhere to them" (Dědek, 2014, pp. 164-166).

The Danish krone has been part of ERM II since 1999, i.e. almost 20 years. At the same time, the Danish government has not set (and does not have to set in future) any deadline for the adoption of the euro.

4.2   The currencies of the Baltic countries in ERM II

The original strategy of the Baltic countries was similar to that of the Czech Republic, i.e. to remain in ERM II for the shortest possible period. Specifically:

- Lithuania was the first country which requested the European authorities to investigate its compliance with the conditions for the adoption of the euro. In the spring of 2006, the Lithuanian currency had been in ERM II for a mere 22 months. Neither the Commission nor the ECB had any objections to this shortened period, because the exchange rate had been stable in the previous period (they also respected it in the case of several other countries such as Finland and Italy in the case of the ERM and Slovenia in the case of ERM II).
- Latvia had intended to adopt the euro at the beginning of 2008. If it had met this deadline, it would have remained in ERM II for 32 months, i.e. the required 2 years plus the essential half-year period.
- Estonia had planned to adopt the euro in the same way as Latvia, i.e. as of the start of 2008. However it entered ERM II one year earlier. If this plan had been adhered to, the Estonian currency would have remained in ERM II for one year more than the absolutely essential period.

Lithuania's failure (to meet the inflation criterion) resulted in the deferral of the original dates for adoption of the euro. Estonia has requested an investigation into how it had met the conditions until spring 2010, while Latvia did so in the spring of 2013 and Lithuania reapplied for the second time in the spring of 2014. Each of these countries then adopted the euro as of the beginning of the following year. *The actual length* of time spent in ERM II was therefore extended to 7.5 years (Estonia), 9 years (Latvia) and 10.5 years (Lithuania). The precise data is contained in Table 1. (For the sake of completeness, the table also includes information on the evaluated two-year period approximately half a year before the replacement of the national currency with the euro; there is no point in differentiating this particular period from the point of view of our investigation).

Table 1. The Baltic countries – the period spent in ERM II

Country (currency)	In the ERM II from	Original interest in the euro	Intended period of time spent in the ERM II	Adoption of the euro	Actual period of time spent in the ERM II	Evaluated two-year period
Lithuania (LTL)	28.6.2004	2007	30 months	2015	126 months	VI 2004 – IV 2006 V 2012 – V 2014
Latvia (LVL)	2.5.2005	2008	32 months	2014	104 months	V 2011 – V 2013
Estonia (EKK)	28.6.2004	2008	42 months	2011	78 months	IV 2008 – IV 2010

Sources: European Central Bank (2018), Commission of the European Communities (2006a, 2006b).

A comparison of the planned participation in ERM II (and the subsequent adoption of the euro) and the actual developments shows that long-term participation in ERM II *was not intended*, but was forced by unexpected circumstances. In the case of the Czech Republic, this would, however, involve a longer period of participation in ERM II which *would be planned* and not forced. Despite this, we are of the opinion that the experience of the Baltic countries with regard to their participation in ERM

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II is relevant for the Czech Republic in the case of its participation in ERM II without the designation of a specific intended date for the adoption of the euro. Why? In both cases, the participants in the foreign exchange markets made their decisions under the same conditions of uncertainty as far as the deadline for the irrevocable fixation of the exchange rate with the so-called conversion coefficient is concerned.

5   The development of the exchange rates and the indicators of "severe tension"

This session explains the development of exchange rates of Danish krone and Baltic states – Latvia, Estonia and Lithuania.

5.1   The Danish krone

The exchange rate is in a "peg with a narrow fluctuation band" regime. It fluctuates around the central parity of the Danish krone to the euro which has been the same ever since the currency joined ERM II, at 7.46038 DKK/EUR. The fluctuation band of ± 2.25% amounts to:
- a depreciation margin of 7.62824 DKK/EUR,
- an appreciation margin of 7.29252 DKK/EUR.
- the exchange rate was almost stable throughout the entire 1999-2017 period and any fluctuations by no means reached the margins of the fluctuation band (Figure 1).
- the maximum fluctuations in the exchange rate were:
- in the depreciation direction at the end of 2000 and in the spring of 2014 (roughly 0.1% around the central parity),
- in the appreciation direction at the end of 2002 and early 2003 (roughly 0.5% around the central parity).

The official international reserves increased in 1999-2017 from 169.2 billion DKK to 467.1 billion DKK (always as of the end of the year), i.e. by 296.2%. No significant downward movement was recorded during their development which would have borne out any depreciation pressure on the exchange rate. Autumn 2008 was an exception (a fall to 133.7 billion DKK in October 2008) in association with the global financial crisis and the debt crisis in the euro area which led to a lack of faith in the European currencies. Significant short-term growth occurred in the spring of 2015 (756 .9 billion DKK in March), but this was then followed by a fall.

The interest rate differential is measured as the difference between the three-month CIBOR interbank interest rate and the three-month EURIBOR interest rate, always as of the end of the year. It displayed very low values around zero throughout the entire monitored period and in three cases was even slightly negative. 2008 was an exception (2.02 percentage points) with the same context as that which affected the fall in international reserves.

Table 2 sets out the aggregate information concerning these indicators, while Figures 1 and 2 provide a detailed view.

Table 2. Denmark – the exchange rate stability criteria (1999-2017)

The deviation in the exchange rate (%)	The change in international reserves (%)	The interest differential (percentage point)
+0.1; - 0.5	296.2	-0.65 – 2.02

Sources: Exchange rate: http://nationalbanken.statistikbank.dk/909
Reserves: http://nationalbanken.statbank.dk/nbf/125955
CIBOR: http://www.finansraadet.dk/Tal--Fakta/Pages/satser/regler-for-fastlaeggelse-af-cibor/historiske-satser.aspx
EURIBOR: https://www.emmi-benchmarks.eu/euribor-org/euribor-rates.html.

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Fig. 1. Development of exchange rate DKK/EUR, 1999-2018 (daily rates) (Source: Denmark National bank: https://www.nationalbanken.dk/en/monetarypolicy/fixed_exchange_rate_and_ERM2/Pages/default.aspx)
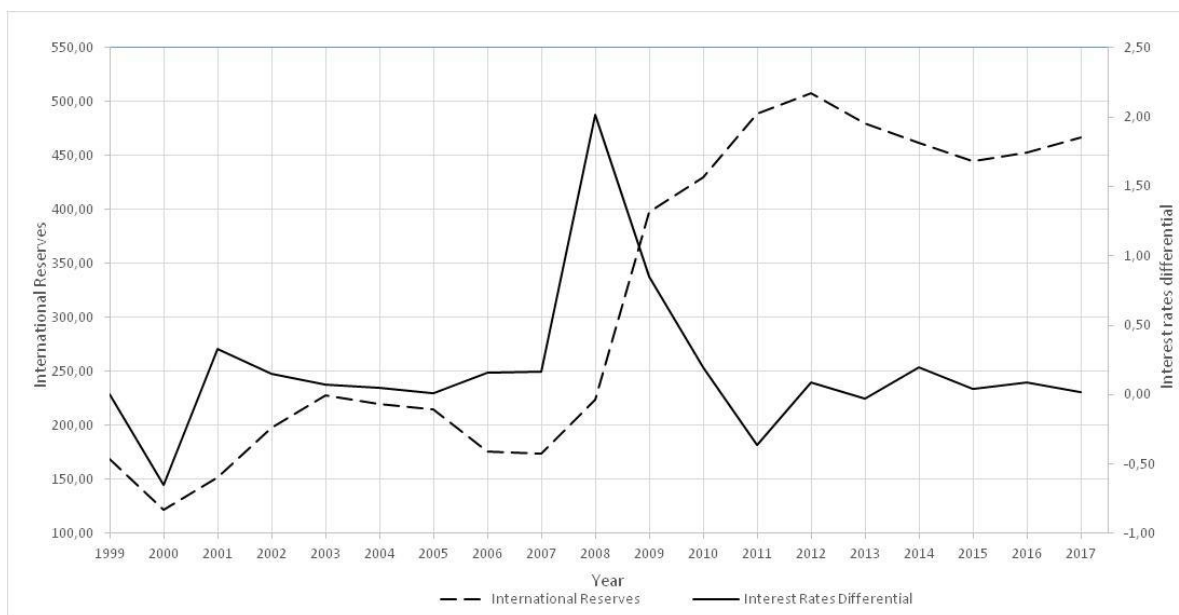
Fig. 2. Development of official international reserves (DKK billion) and interest rate differential (p.p.) in Denmark (1999-2007, end of year) (Source: as in Table 2, own elaboration)

5.2 The currencies of the Baltic countries

The exchange rate was maintained in several variants of the exchange rate regime (Helísek and Mentlík, 2018):

- Lithuania: currency board
- Latvia: peg with a narrow fluctuation band ± 1%
- Estonia: currency board
- *The exchange rates* of Lithuania and Estonia were absolutely stable (deviations of 0% around the central parity). Latvia's exchange rate (LVL/EUR) fluctuated within the fluctuation band (Fig. 3):
- 0.709832 depreciation margin (the exchange rate was close to margin especially in 2010-2011),
- 0.695776 appreciation margin (the exchange rate was close to margin especially in 2005-2006, 2012).

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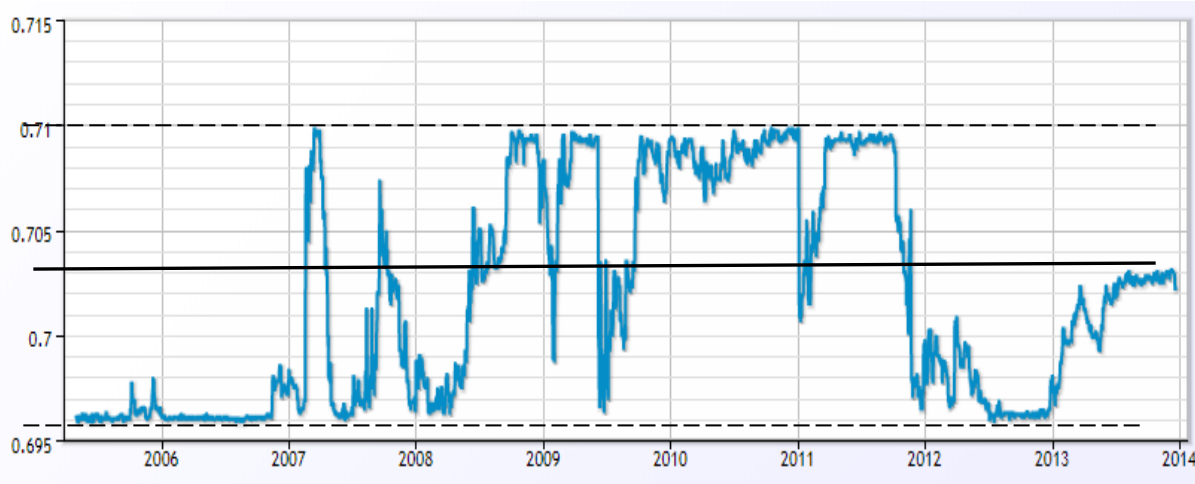
Fig. 3 Development of exchange rate LVL/EUR, 2. 5. 2005 – 31. 12. 2013 (daily rates) (Source: Latvijas Banka: https://valutaskurss-eiro.lv/kursi/LVL-lats-latvija/, own elaboration).

The official international reserves recorded a growth trend in all three countries (comparison at the beginning and end of the monitored period), albeit with short-term fluctuations. They fell in Lithuania and Latvia in 2008, while this was also the case in Estonia one year before the introduction of the euro, i.e. in 2010. The reserves are measured in millions of EUR as of the end of the year.

The interest rate differential was measured as the difference between the national three-month interbank interest rates (VILIBOR, RIGIBOR and TALIBOR) and the three-month EURIBOR interest rate (always as of the end of the year). All three countries reported low values at the beginning and the end of the period when the national currency was incorporated into ERM II. During the course of this period, however, there was a significant increase in 2007-2009. As in the case of the Danish currency, these exceptionally high interest differentials can be explained by the global financial crisis and the lack of faith in the European currencies in association with the debt crisis in the euro area.

Table 3 sets out the aggregate information concerning these indicators, while Figures 4, 5 and 6 provide a detailed view.

Table 3. The Baltic countries – the exchange rate stability criteria

Country (currency)	Period of participation in the ERM II	Central parity XXX/EUR	Exchange rate deviations (%)	Change in international reserves (%)	Interest differential (percentage point)
Lithuania (LTL)	VII 2004 – XII 2014	3.45280	0	172.0	0.05 – 7.00
Latvia (LVL)	V 2005 – XII 2013	0.702804	+1, - 1	189.1	-0.16 – 10.65
Estonia (EKK)	VII 2004 – XII 2010	15.6466	0	43.6	0.11 – 4.98

Source: websites of the national central banks and ECB. Exchange rates: Bank of Lithuania: https://www.lb.lt/exchange/history.asp?Lang=E&Cid=EUR&Y=2014&M=12&D=31&id=4046&ord=1&dir=ASC. Dates from Bank of Latvia show absolutely stable exchange rates at central parity. https://www.bank.lv/en/statistics/stat-data/2015-03-15-11-51-38/overview-of-exchange-rates. Estonian Bank: http://statistika.eestipank.ee/#/en/p/VALUUTA EURIBOR: https://www.emmi-benchmarks.eu/euribor-org/euribor-rates.html.

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Fig. 4. Development of international reserves (EUR million) and interest rate differential (p.p.) in Lithuania (2004-2014, end of year) (Sources: Reserves: https://www.lb.lt/en/official-reserve-assets, VILIBOR: ttps://www.lb.lt/en/historical-data-and-external-links, own elaboration)

Fig. 5. Development of international reserves (EUR million) and interest rate differential (p.p.) in Latvia (2005-2013, end of year) (Sources: Reserves: For 2005-2006 (net reserves) https://www.bank.lv/en/statistics/stat-data/net-international-reserves; other years: https://statdb.bank.lv/lb/Data.aspx?id=121, RIGIBOR: https://www.bank.lv/statistika/dati-statistika/naudas-tirgus-index/rigibid-rigibor-vesturiskie-dati, own elaboration)

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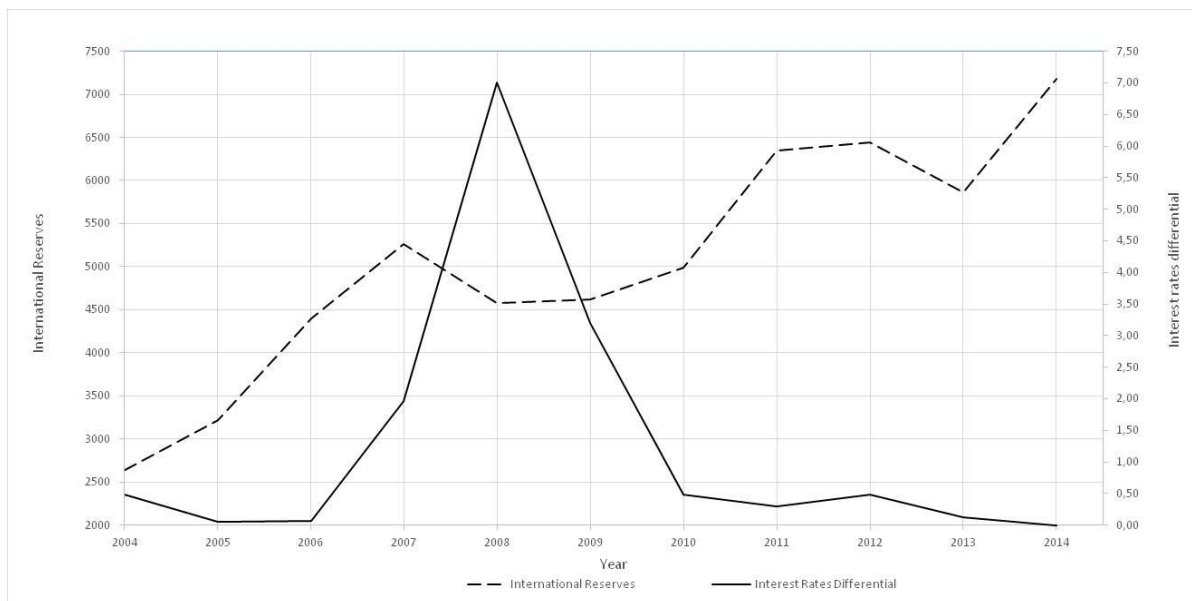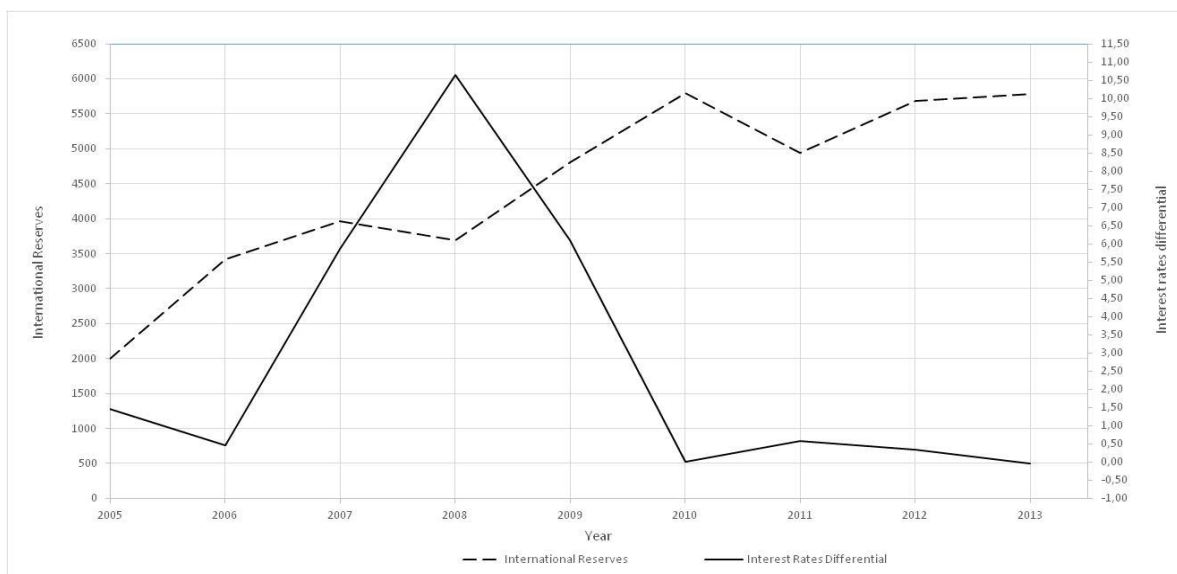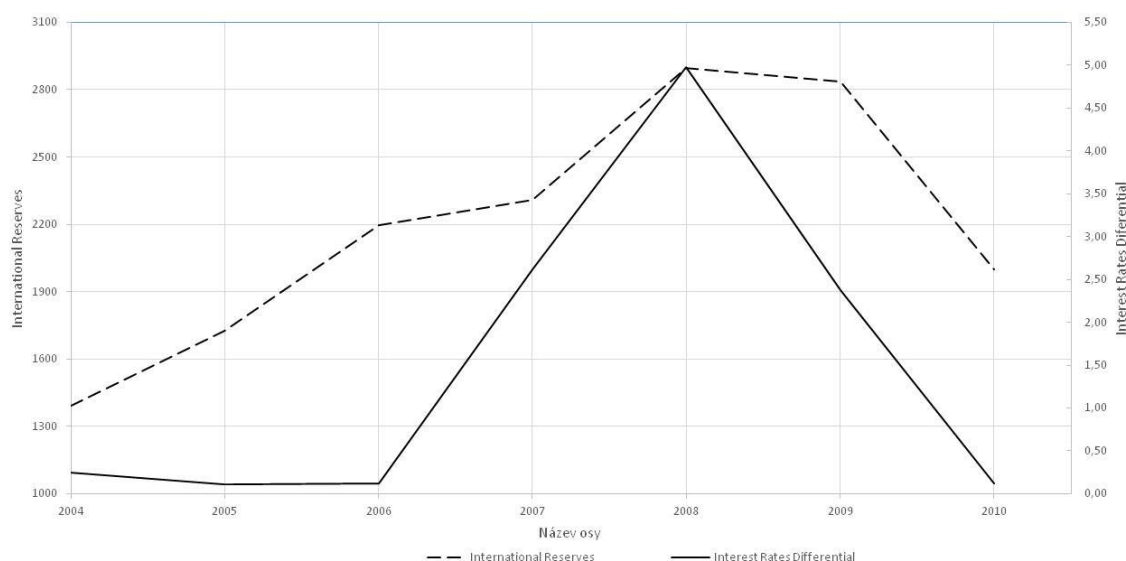of Business Administration in Karvina, 2018

Fig. 6. Development of international reserves (EUR million) and interest rate differential (p.p.) in Estonia (2004-2010, end of year) (Sources: Reserves: http://statistika.eestipank.ee/#/en/p/1134/r/1122/970, TALIBOR: http://statistika.eestipank.ee/#/en/p/1010/r/1730, own elaboration).

6   The evaluation of the exchange rate stability

The exchange rates of the monitored currencies were either almost stable (DKK, LVL) or completely stable (LTL, EKK) throughout the entire period that they remained in ERM II. In the case of the Baltic currencies, the exchange rates were stable both in the "excess" period and in the two-year period prior to the adoption of the euro. At the same time, all of the countries experienced gradual growth in their official international reserves. Low interest differentials were also maintained at the same time.

This conclusion *disproves concerns about the currency crisis* that might occur during participation of the currency in ERM II. *Our research does not confirm the increased risk of the currency crisis* that is feared by the authors listed in Part 2 (Literature Review).

The maintenance of exchange rate stability can be explained *by the faith of the participants in the foreign exchange markets in the commitment of the central bank to maintain the fixed exchange rate.* According to the Danish Central Bank: "Officially, the krone may fluctuate by up to 2.25 per cent on either side of its central rate, but in reality the fluctuations are far smaller. This reflects the high credibility of the fixed exchange rate policy […] The credibility of the regime means that market participants take positions which in themselves stabilise the exchange rate of the krone" (Spange, Wagner Toftdahl, 2014, p. 49).[4]

The central bank's commitment to maintaining exchange rate in ERM II is enhanced by an effort to maintain prestige. In failing to comply with the exchange rate stability criterion, the central bank would lose its credibility.

2007-2009 constituted an exception where there was pressure on the devaluation of the central parities between these currencies and the euro. The falls in international reserves (with the exception of Estonia where the reserves stagnated) and the increased interest rates differentials of 2-11

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[4] The Danish Central Bank illustrates the behaviour of the participants in the foreign exchange markets in the case of devaluation pressures: "Participants in the financial markets are confident that the exchange rate of the krone will continue to fluctuate within a narrow band around the central rate. […] In a weak krone scenario, positions are typically taken in expectation of a strengthening, which has contributed to stabilising the exchange rate of the krone close to the central rate. The stabilising positions taken by market participants have reduced the need for intervention by Danmarks Nationalbank." (ibid, p. 53)

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percentage points were expressions of "severe tension". Thanks to the interventions in the foreign exchange markets and the temporarily high interest rates, the fixed exchange rates in ERM II were able to be maintained also during this period of crisis. The Danish Central Bank evaluates this period thus: "Moreover, the instruments [i.e. the intervention in the foreign exchange markets and the changes in interest rates of the central bank – M. H.] have proved to be sufficiently robust to handle extraordinary situations such as, most recently, the implications of the 2008 financial crisis and the subsequent sovereign debt crisis in several euro area member states on the exchange rate of the krone" (Spange, Wagner Toftdahl, 2014, p. 50).

However, it is not certain how the European Commission and the ECB would assess the fulfilment of the exchange rate convergence criterion in terms of the "without severe tension" condition. Taking into account that this was a period of global financial crisis (not the internal economic problems of these countries), the criterion could be met.

7   Conclusion

The aim of this paper has been to evaluate the experience of the participation of a national currency in ERM II for a period which is longer than the necessary period (two to three years). The experiences of Denmark (almost 20 years of participation in ERM II) and the three Baltic states (8-11 years of participation in ERM II) have been evaluated. The exchange rates were stable.

The central banks of these countries also managed to maintain the stability of the exchange rates of their currencies during the crisis years of 2007-2009 with the use of intervention in the foreign exchange markets and temporarily higher interest rates. Concerns about "currency turbulence" have not been fulfilled.

The precondition for the long-term maintenance of an exchange rate in ERM II is the conviction of the participants in the foreign exchange markets (financial investors, no matter whether this involves speculators or investors who are diversifying their portfolios) with regard to the *determination of the central bank to maintain the exchange rate within this mechanism* and sufficiently *high foreign exchange reserves of the central bank*. These experiences with the "Danish Scenario" are also applicable in the case of the participation of the Czech koruna in ERM II.

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ANALYSIS OF HOUSING AFFORDABILITY IN SELECTED EUROPEAN COUNTRIES

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Abstract
The Czech Republic is a country with the highest growth of real estate's prices in Europe. The paper is focused on the analysis if this long-term growth of real estate's prices influences the housing affordability, i.e., if the price growth is in balance with the growth of households income and what is the situation in the Czech Republic in comparison to other European countries. Hence, the objective is to analyse the housing affordability in the Czech Republic in relation to the selected European countries and to make a comparison of the situation based on the main ratios. The availability of housing will be find out based on the selected ratios, which will be derived from the prices of apartments, rents, household incomes, mortgages and interest rates. Possible imbalance in the markets of ownership and rent housing will be explored with rent balance (imbalance) indicator, which can be a signal of overvaluation or undervaluation of these housing segments. The structure of real estate markets in selected countries will be also analyzed and the quality of housing based on the main statistical indicators will be found out. The comparison of the housing affordability in the selected countries will be done based on the statistical analysis of the above mentioned indicators.

1   Introduction

Many countries in the world have been experiencing boom in house prices for a couple of years, and the European countries are no exception. However, one of the main causes of the global crisis in the late 2000s was the bursting of the housing bubble in the United States (Hattapoglu and Hoxha, 2013). The burst caused the values of securities tied to U.S. real estate pricing to plummet, resulting in vast losses of many institutions and businesses and leading to the "Great Recession" (Financial Crisis Inquiry Commission, 2011). Therefore, it is very important to carefully analyse the housing market and adequately react to possible signals of the housing bubble formation because of the lately experienced fallout of its bursting.

This paper is related to the increasing literature, which focuses on the empirical investigation in housing market. The main goal of this paper is to make an analysis of the situation in the housing market in selected European countries. Using the main housing ratios, which are often used as indicators of overvaluation of housing prices, we will examine the reasons of their overvaluation or undervaluation.

2   Literature review

Recently, there has been a lot of articles and papers dealing with the housing market and related indicators and models. For example, Gallin (2008) constructed an error correction model and found out that that the rent-price ratio is a valid indicator of valuation in the housing market. Campbell et al. (2009) used the Campbell-Shiller formula to decompose the price-rent ratio in the US regional data into the present discounted values of expected housing market fundamentals (i.e., rent growth, real interest rate and risk premium for housing asssets), and found that housing risk premium accounts for a significant part of rent-price ratio volatility. Kim and Lim (2014) examined the fundamental

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sources of variations in price-rent ratio in the Irish housing market over the period 1976 to 2012. Using the Campbell-Shiller present value formula, they found out that expected housing premium is the principal source of variation in price-rent ratio. Over the whole period, their results indicate that variation in expected housing premium accounts for nearly 500% of variation in price-rent ratio, while expected rent growth and real interest rate explained far less. Morover, they found that the correlations among the three components of the rent-price ratio (i.e., rent growth, real interest rate and risk premium for investing in housing) considerably depress fluctuations in the rent-price ratio. In particular, the correlation between real interest rate and expected future premium was negative, and it lowered variation in the ratio by more than 400 %. Also, the positive correlation between rent growth and expected housing premium was found large enough to lower the volatility in the ratio by about 350% (Kim and Lim, 2014).

Hattapoglu and Hoxha (2014) examined the behaviour of people regarding the price appreciation in housing market as an important factor in the housing price appreciation, which can lead to housing bubbles. They found that that people's appreciation expectations are based on the percentage change in prices, which provides evidence for price instability. In connection with this topic, there is a few articles and papers focused on the price bubbles in the housing market in different countries of the world. The situation in China is well described by Dreger and Zhang (2013) and by Zhang et al. (2017), in the U.S. by Clark and Coggin (2011), in Denmark by Abildgren, Hansen and Kuchler (2018), in Israel by Arestis and Gonzales-Martinez (2017), in Spain by Fernandez-Kranz and Hon (2006), in Kenya by Kibunyi et al. (2017) and in the Czech Republic by Zemcik (2011). Gomez-Gonzales et al. (2018) studied the existence and international transmissions of housing market bubbles, using quarterly information of twenty OECD countries for the period from 1970 to 2015. They found that housing bubbles were present in all the countries included in their sample. They also found that the transmissions (mostly to European countries) had origin in the US housing bubble preceding the subprime crisis.

3   Methodology and data

The analysis of the housing market in the selected European countries will be made using the following main ratios: price-to-rent ratio (P/R ratio), price-to-income ratio (P/I ratio), price-to-GDP ratio (P/GDP ratio), price-to-wage ratio (P/W ratio) and mortgage-to-income ratio (M/I ratio).

The P/R ratio is the ratio that measures the current home prices to annualized rent in a given location. It is often used as a benchmark to estimate whether it is cheaper to rent or own a house. However, the P/R ratio does not say anything about the affordability of buying or renting in a given housing market. Cities where both renting and buying are very expensive, such as London or Prague, can have the same price-to-rent ratio as a small town in Albania where both homes and rents are relatively cheap. What is important for the housing market analysis is the fact that the significant increase in the P/R ratio can be an important signal for the housing bubble. There is an online residential real estate website Trulia (Trulia, 2018) in the United States that is used to produce a price-to-rent ratio called the "Trulia Rent vs. Buy Index" that compares the totals costs of homeownership with the total cost of renting a similar property. Trulia's price-to-rent ratio is calculated by dividing the average list price by the average yearly rent price, as follows:

$$\frac{P}{R} ratio = \frac{average\ list\ price}{average\ monthly\ rent \times 12} \tag{1}$$

Trulia established the following thresholds for the P/R ratio: less than 15 indicates it is much better to buy than rent; from 15 to 20 indicates it is typically better to rent than buy; and 20 or more indicates it is much better to rent than buy. The average Trulia P/R ratio was around 15 before the housing

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bubble and subprime meltdown. The ratio rose to 24.50 in 2007, before falling and bottoming out in 2012 (Investopedia, 2018).

The price-to-income ratio (P/I ratio) is generally the ratio of average house prices to average familial disposable incomes. The P/I ratio measures the affordability of housing in a given area. The idea is clear: increases in housing prices cannot deviate indefinitely from growth in the incomes of house buyers. If the appreciation of housing prices outpaces the growth of incomes for a considerable time period, households will no longer afford to buy houses, which bring housing prices back to the long-term growth of incomes. Therefore, the forecasting of P/I ratio is of importance both for academics and policy-makers (Chen and Cheng, 2017).

The price-to-GDP ratio (P/GDP ratio) is very close to the P/I ratio. The ratio is calculated as the portion of the cost of a typical upscale housing unit of 100 square metres, compared to the country's GDP per capita. The formula is:

$$\frac{P}{GDP} ratio = \frac{price\ per\ square\ metre}{GDP\ per\ capita} * 100 \tag{2}$$

The P/I and P/GDP ratios are closely monitored by the IMF, as other indicators of possible housing bubble formation. The dramatic increase in the ratios can be a signal for the housing bubble.

Mortgage-to-income ratio (M/I ratio) calculates the percentage of person's gross income required to cover their mortgage. In other words, if you pay €1,000 each month in expenses because of your mortgage and you make €4,000 each month, your M/I ratio is 25%: Quarter of your monthly income is being used to pay mortgage.

It has been found, that different data sources refer to different numbers for the same time. The annual net wages for the latest period 2018 were presented as different by the Eurostat and by www.numbeo.com for instance. The reason of these differences consists in different methodology. Since the www.numbeo.cz determines the average monthly net salary after tax as an average of data contributed by the contributors, Eurostat presents the official data received from the national statistical agencies. To make it more objective, if necessary to count the comparative indicators there has been used the average of these numbers.

The GDP per capita was taken from the World Bank's statistical survey. Such variables were important to determine P/GDP ratio comparative indicator. In some cases it is more objective to use P/GDP ratio (even some sources presents only the P/GDP ratio in their housing statistics instead of maybe less informative P/I ratio) instead of P/I ratio. While net Income in P/I ratio indicator captures more of the employees' situation, the GDP per capita in P/GDP ratio may capture the economic situation of traders and other entities whose income does not depend on dependent activity (as in case of employee). To make it more objective, if necessary to count the comparative indicators there has been used the averages of P/GDP ratio and P/I ratio.

The levels of prices and rents were from www.numbeo.com taken. Other sources of prices were found but due to incompleteness or insufficient form (Eurostat presents only indexed prices) I decided for the www.numbeo.com source. The method used to determine housing prices and rents was derived from the average prices entered into the system by individual contributors.

Some of values of indicators describing the real estate market of selected countries as M/I ratio, P/I ratio and P/R ratio was recorded directly from www.numbeo.cz source.

The rank of the selected European countries will be made by comparing the calculated values of the main indicators mentioned above.

4   Empirical results

The results of survey are presented in next tables. For the better description the countries are from the highest to lowest value sorted. For the main analysis the indicators mentioned in previous chapter

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were used. There were used P/I ratio, P/GDP ratio, P/W ratio, M/I ratio, P/R ratio and for the aggregation of results the combination of some of them (P/I, P/GDP, P/W and P/R). The basic values of indicators are presented in the next Table 1.

Table 1. The basic values of indicators and the ranks of countries, 2018

Country	P/I value	P/I rank	P/GDP centre value	P/GDP centre rank	P/W centre value	P/W centre rank	M/I value	M/I rank	P/R centre value	P/R centre rank
Albania	14.5	2	7.27	5	29.58	1	124.61	2	23.78	13
Austria	9.82	17	6.84	8	14.15	22	59.93	21	29.3	3
Belgium	7.04	28	4.80	22	11.31	28	43.59	28	19.52	23
Bulgaria	8.81	22	3.78	29	17.46	12	66.12	14	18.14	25
Croatia	11.32	9	6.05	13	17.79	10	89.83	4	29.19	4
Cyprus	6.35	30	3.46	30	7.46	30	46.48	27	16.92	27
Czech Republic	**14.14**	**3**	**6.68**	**11**	**27.47**	**3**	**87.33**	**5**	**28.3**	**7**
Denmark	7.04	29	6.68	10	9.91	29	43	30	22.85	16
Estonia	9.17	20	5.27	17	16.95	15	58.62	22	22.84	17
Finland	7.5	26	7.17	7	12.29	25	43.45	29	27	8
France	11.72	7	9.50	1	18.20	9	70.52	12	35.79	1
Germany	8.48	24	6.84	9	14.78	21	50.93	25	28.9	5
Greece	9.83	16	3.99	28	11.83	27	76.15	6	24.25	12
Hungary	13.16	4	5.21	18	23.18	4	107.4	3	23.53	14
Ireland	8.06	25	4.39	25	12.57	24	57.81	23	15.94	29
Italy	9.69	18	7.26	6	15.34	20	60.94	19	28.43	6
Latvia	9.9	14	4.48	24	16.22	17	63.8	16	21.69	19
Lithuania	11.92	5	4.91	20	22.09	5	72.82	8	23.33	15
Luxembourg	11.87	6	5.63	16	19.00	8	71.61	10	24.74	11
Malta	10.1	10	4.85	21	19.72	6	71.47	11	16.21	28
Netherlands	7.42	27	5.68	14	13.82	23	47.21	26	19.66	22
Poland	10.06	11	4.71	23	17.22	14	71.92	9	20.24	21
Portugal	11.71	8	6.12	12	19.59	7	75.85	7	19.23	24
Romania	9.94	12	4.19	26	17.41	13	69.08	13	21.22	20
Slovakia	9.94	13	4.07	27	17.50	11	60.01	20	17.79	26
Slovenia	9.29	19	4.91	19	15.42	19	63.82	15	25.81	9
Spain	8.76	23	5.66	15	12.08	26	54.9	24	21.89	18
Sweden	9.89	15	8.13	2	15.86	18	63.32	17	34.08	2
Ukraine	15.25	1	8.08	3	29.13	2	319.66	1	15.49	30
United Kingdom	9.05	21	7.60	4	16.28	16	61.6	18	24.85	10

Source: own survey, www.numbeo.com, Eurostat 2018, World Bank 2018.

The three basic indicators P/I, P/GDP, P/W looks to be analogical. P/I and P/W show the third position of the Czech Republic with its value 14.14 and 27.47 respectively. By other words the price of flat is equal to 14.14 or 27.47 multiple of average employee income. This basic indicators point to overvalued housing prices in Czech Republic (ranks 3). The other most expensive countries are Ukraine (rank 1, rank 3 respectively) and Albania (rank 2, rank 1 respectively)

If we compare these indicators with P/GDP ratio the Czech Republic position seems to be better. P/GDP ratio for the average prices of flats situated in the centrums of Czech cities is equal to 6.68 which represents the eleventh position from selected European countries. P/GDP ratio may be more

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general indicator in some cases because it includes not only dependent employee position. That situation leads me to an opinion, that worst situation is indicated in the segment of employees instead of segment of traders and self-employed entities. In case of falling flat prices the segment of employees will be in more risky situation than the segment of traders and self-employed entities.

The worst P/GDP ratio level represents France with its value 9.50 which is 42% above the level of Czech Rrepublic. From that point of view the cheapest countries are Cyprus (rank 30), Bulgaria (rank 29) and Greece (rank 28).

The M/I ratio by www.numbeo.com represents Mortgage as Percentage of Income ratio of the actual monthly cost of the mortgage to take-home family income. It assumes 100% mortgage is taken on 20 years for the house (or apt) of 90 square meters which price per square meter is the average of price in the city centre and outside of city centre. The level of M/I ratio in Czech Republic is equal to 87.33 % with the rank 5, which seems to be high for the Central Bank analysts. According to the latest information from the Czech Central Bank (July 2018) there will be implemented two new changes in mortgage affordability. The monthly cost of the mortgage must not be higher than 40% of net monthly income the Czech Central Bank presents as first restriction. As the second restriction, the level of mortgage (including the other credits) must not be higher than 8 multiple of net annual income.

The other limits for mortgage which has already been implemented by Czech Central Bank is maximum of 80% value of flat market price to be provided as mortgage by commercial banks. It is essential to save at least 20% of the funds to cover the purchase of flat. In previous period the Czech Central Bank increased interest rates, which should restrict overvaluation of Czech real estate market.

To compare M/I ratio the worst levels are representing by Ukraine (319.6, rank 1), Albania (124.61, rank 2) and Hungary (107.4, rank 3). On the other side the best results are shown in Denmark (43, rank 30), Finland (43.45, rank 29) and Belgium (43.59, rank 28).

The last presenting ratio is P/R ratio (developed by www.numbeo.com) which is analogical to gross rental yields. Lower values suggest that it is better to buy rather than rent, and higher values suggest that it is better to rent rather than buy.

The Czech Republic with its value of P/R ratio 28.3 represents the seventh position. The highest values of P/R ratio you can find in cases of France (35.79, rank 1), Sweden (34.08, rank 2) and Austria (29.3, rank 3). The opposite countries shown in the table are Ukraine (15.49, rank 30), Ireland (15.94, rank 29) and Malta (16.21, rank 28).

The data taken from the Table 1 will be transformed into the aggregate results by the methodology described in previous chapter. To calculate possible overvaluation or undervaluation the indicators of P/I, P/GDP, P/W and P/R ratios are going to be used. The results are in percentage shown and valid for centrum areas and outside of centre areas as well as average value of values for centre and outside of centre areas. The rank is assigned to the countries according to their average value. The results are in next Table 2 shown.

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Table 2. Overvaluation and undervaluation of flat prices in %, July 2018

Country	Overvaluation, undervaluation in % city centre areas	Overvaluation, undervaluation in % outside of centre	Average	
			value	rank
Albania	22.75	3.23	12.99	6.00
Austria	13.06	18.96	16.01	5.00
Belgium	-21.53	-10.03	-15.78	26.00
Bulgaria	-16.28	-12.59	-14.44	24.00
Croatia	18.32	25.42	21.87	4.00
Cyprus	-35.57	-30.30	-32.94	30.00
Czech Republic	**31.75**	**32.55**	**32.15**	**2.00**
Denmark	-12.89	-10.13	-11.51	21.00
Estonia	-2.60	0.84	-0.88	15.00
Finland	2.66	-5.18	-1.26	16.00
France	39.99	33.01	36.50	1.00
Germany	11.88	13.04	12.46	7.00
Greece	-6.24	6.72	0.24	14.00
Hungary	10.75	0.56	5.66	12.00
Ireland	-29.34	-31.82	-30.58	29.00
Italy	12.50	2.88	7.69	11.00
Latvia	-6.87	-10.44	-8.65	20.00
Lithuania	7.60	10.73	9.16	9.00
Luxembourg	7.69	15.13	11.41	8.00
Malta	-16.87	-18.91	-17.89	28.00
Netherlands	-16.77	-17.18	-16.97	27.00
Poland	-9.24	-6.68	-7.96	19.00
Portugal	-6.62	-16.87	-11.75	22.00
Romania	-6.70	0.87	-2.91	17.00
Slovakia	-16.22	-7.92	-12.07	23.00
Slovenia	3.38	13.22	8.30	10.00
Spain	-12.04	-17.54	-14.79	25.00
Sweden	29.71	24.37	27.04	3.00
Ukraine	0.09	-9.68	-4.79	18.00
United Kingdom	3.61	3.74	3.68	13.00

Source: own calculations, www.numbeo.com, World Bank 2018.

The overvaluation and undervaluation is calculated due to the deviation of average values counted from the given parameters. The methodology of calculation is presented in previous chapter.

The results from Table 2 show the overvaluation of flats in Czech Republic. The price overvaluation of flats is 32.15% above the average value for the file of presented countries. The rank assigned to the country is 2. The Czech Republic is the country with one of the most overvalued flats in Europe.

The most overvalued flats in Europe you can find in France with the rank 1, where the level of overvaluation exceeds 36%. The rank number 3 belongs to the Sweden with its overvaluation of 27.04%.

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On the other hand the most undervalued prices of flats are Cyprus (-32.94%, rank 30), Ireland (-30.58%, rank 29) and Malta (-17.89, rank 28). It is assumed the increase of price flats in the future in these countries.

From the Table 2 it is seen even the difference between overvaluation/undervaluation of flat prices in city centre areas and overvaluation/undervaluation of flat prices in outside city areas. The difference between overvaluation of city centre areas and outside of centre areas is -0.80% in case of Czech Republic. It imply there is nearly no difference between cities and rural areas. The demand covers all the areas equally.

The highest difference is indicated for Albania (+19.52%). While the overvaluation in cities there is indicated at the level of 22.75%, the situation in outside of central areas indicates the overvaluation only +3.23%. The next country with the high difference is Belgium (-11.49%). Undervaluation of central city areas is equal to -21.53% which is more than in outside of city areas (-10.03%). The third position belongs to the Portugal (10.25%). Its city centrum areas are undervalued by -6.62% while the outside city centre areas are undervalued by -16.87%.

4.1 Likely the Reasons for Overvaluation in the Czech Republic

The prices in the Czech real estate market seems to be overvalued. The analysis of the basic indicators push the Czech Republic to the high positions in comparison with other 30 countries. Even the other analyses confirm the indicated overvaluation in the Czech real estate market (Czech National Bank, 2017). The concurrence of some circumstances support the price increase:

1. mortgage interests looks to be favourably. The latest average data shown by www.hypoindex.cz presents 2.49% p.a., which even dropped from 2.51% p.a. in comparison with previous month. On the other side the Czech National Bank announced an increase of interest rates through the year, which can help to cool down the price overvaluation.
2. increase of wages. In the last decade, the strongest wage growth has been recorded. The data of the Czech Statistical Office (www.czso.cz) announced, the monthly wages reached 1181.30 EUR in 1st quarter of 2018, which supports demand in the Czech real estate market. See the progress in Fig. 1.
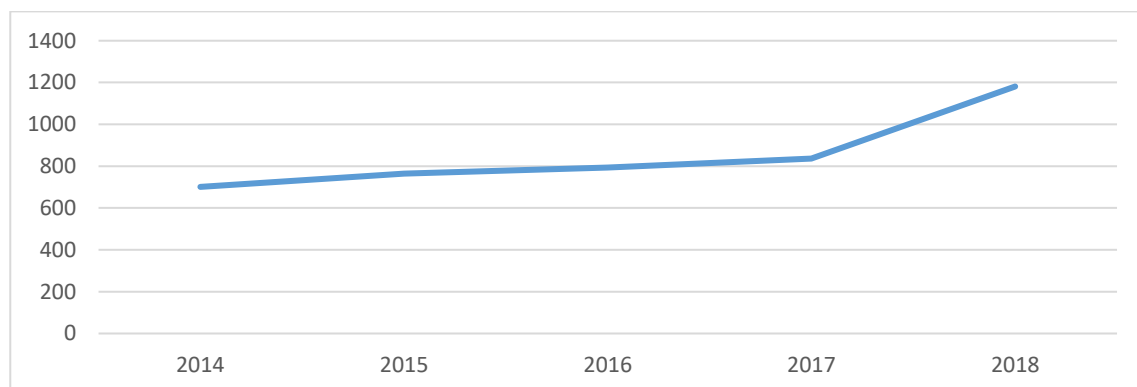
Fig. 1. Increase of wages in Czech Republic from 2014 – 1st quarter 2018 (Source: www.czso.cz).

3. demographical aspects. The increase of single households is a typical trend of the last decade not only in the Czech Republic, but in other European Countries as well. The latest data of Eurostat has shown the increase of single member households since 2007. While in 2007 there were 25.5 % of single member households in the Czech Republic, in 2017 the share reached 30.4%. For easier imagination, the highest share of single member households was reached in Sweden (52%).

4. impact of the monetary policy of the central bank of the Czech Republic. The monetary policy of the Czech National Bank is reflected in the Czech Real Estate Market. It seems the policy of

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cheap currency from 2013-2017 affected the price increase in real estate market. The price increase of flats is the most evident in Prague where the concept of share economy is the most developed. In fact the concept of share economy allows to "export" the real estates (which in typical economical model is impossible) abroad. The cheap currency policy attract not only the typical Czech good producers, but the tourists as well. Because of it the owners of flats in high tourist attractive areas move the flats from long term rent market segment to the short term rent market segment. It causes the increase of prices. The real estate analysts of Komečni Banka show the increase of short rent segment in Prague from 1500 of ads in 2013 to 11500 ads in 2017, which represents 25% of all the add offers in Prague.

5   Conclusion

The results obtained by simple comparative analysis of the main housing indicators show the overvaluation of real estates in the Czech Republic. The overvaluation was indicated by the P/I ratio, P/GDP ratio, P/W ratio and P/R ratio. Even the other ratio indicators certify the overvaluation (M/I ratio indicator). To compare the situation of the Czech real estate market with the other European countries the Czech Republic occupies the second position, just behind France and Sweden.

The likely reasons for the steep increase of real estates are: 1. the mortgage interest, 2. increase of wages, 3. demographical aspects, 4. impact of the monetary policy of the Czech National Bank.

The housing affordability according to the analysed indicators is low in comparison with the other comparative states.

In nearest future, the housing affordability will be strongly influenced by increasing of the interest rates.

6   Acknowledgement

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SOCIAL SPENDING AND INCOME INEQUALITY

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Abstract
Over recent decades income inequality has increased in many advanced economies (which is attributed to a range of factors), it can be detrimental to achieving macroeconomic stability and growth and some authors believe that it was one of the main causes of the 2008 global financial crisis. The aim of this paper is to determine the effect, which have social spending on income inequality because this instrument of fiscal policy should play a significant role in reducing income inequality. The selected representative sample consists of 34 OECD member countries in the period 2000-2014. As the dependent variable approximating income inequality is used the Gini coefficient, one of the best known and used measures of income inequality, prepared in accordance with OECD methodology. To approximate the impact of social spending on income inequality the dynamic panel data model is used.

Keywords
Income Inequality, Social Spending, OECD, Panel Data Analysis.

JEL classification
C13, D32, I32, R13

1   Introduction

Economist all over the world suggest that since 1980 income inequality has been increasing in many advanced economies and this phenomenon was one of the main causes of the international financial crisis in 2007/2008 and consequentia "great recession". It is not only the problem of income inequality but rozložení wealth obecně and this period of inequality has been labeled as the "great inequality" (Atkinson, 2015; Foster and Yates, 2014). Galbraith (2012) suggest that "inequality was the heart of the financial crisis. The crisis was about the terms of credit between the wealthy and everyone else, as medited by mortgage companies, banks, ratings agencies, investment banks, government sponsored enterprises, and the derivates markets."

Ways to measure income inequality are numerous; mostly Gini coefficient is used. It is probably the best-known index used for this purpose. According to OECD (2015) the Gini coefficient is based on the comparison of cumulative proportions of the population against cumulative proportions of income they receive. It ranges between 0 in the case of perfect equality and 1 in the case of perfect inequality. Income is defined as household disposable income in a particular year. It consists of earnings, self-employment and capital income and public cash transfers; income taxes and social security contributions paid by households are deducted. The income of the household is attributed to each of its members, with an adjustment to reflect differences in needs for households of different sizes. OECD also publishes Gini coefficient without impact of transfers and taxes and differences between these two indicators could demonstrate the impact of fiscal policy in affecting income inequality.

Thanks to this the role of fiscal policy is discussed more often than ever before. Along with taxes are the social spending the primary instrument to achieve redistributive goals in most countries. Most of the redistributive impact of fiscal policy is achieved through the expenditure side of the budget.

The aim of this paper is to determine the effect, which have social spending on income inequality in selected OCED countries through panel data analysis in the period 2000-2014. We want to confirm the hypothesis that the impact of social spending is larger than impact of taxes. Text of the introduction, including motivation, originality etc.

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2   The Fiscal policy and social spending

The economic policy in general is a government policy, which contains specific rules and individual measures through which the government manages, controls and regulates national economy of each country. Fiscal policy is one part of it and its aim is to establish macroeconomic stability (through stabilization), optimal economic growth (pro-growth policy) and solve social problems (through redistribution).

Along with taxes are the social spending the primary instrument to achieve redistributive goals in most countries. Most of the redistributive impact of fiscal policy is achieved through the expenditure side of the budget, especially non-means-tested transfers. According to OECD studies (OECD, 2008) the redistribution achieved by public cash transfers is on average twice as large as that achieved through taxes. On average across the OECD, cash transfers amounted to 11% of GDP and 20% of household disposable income in 2007. They reduced income inequality by about 19% in the late 2000s. Cash transfers ranged from 2, 5 per cent of GDP in Mexico and Korea to over 17% in Austria. Non-means-tested transfers (including public pensions and universal child benefits account for the bulk of the redistribution on the expenditure side, especially in the Nordic economies, Austria, Belgium, Poland and Hungary (Immervoll and col., 2005).

Among most used social spending in advanced economies we classify:

- Pensions
- Family benefits
- Disability benefits
- Unemployment benefits.

In the middle of 2000s old-age pensions account for the largest share of total cash transfers – 55% for the OECD on average. It was accounted, that people above 65 received more than 90% of total transfers. According to OECD (2011) old-age pensions can be sub-divided into three tiers. The first and second tier are mandatory whereas the third is voluntary. The first one has a redistributive function and is publicly provided. The second part plays an insurance or income-replacement role and ensures a living standard comparable to that prior to retirement. The third tier reflects voluntary pension arrangement without redistributive impact. Pension systems in almost all OECD countries has passed reforms in recent years, they try to change system of contribution schemes and the retirement age is increased. Governments tend to make pension systems more progressive.

According to OECD (2011) family cash benefits have a relative strong redistributive impact. Although they account for a rather small share of total cash transfers in most countries, they tend to be more progressive than other transfers. Family cash benefits do not include public spending on services for families with children, norm financial support for families provided through the tax system. Also cross-country variations in the redistributive effect reflect differences in the size of progressivity of such benefits. Most of OECD countries implemented universal cash benefits but some rely on income-tested schemes.

Cash transfers associated with disability and sickness benefits are relatively large. In 2007 they reached up to 20 per cent of GDP on average in the OECD and amounted more than 3 percent in the Nordic countries and the Netherland. Disability benefits reduce income inequality at a given point in time and as net replacements rates for low-wage earners are higher than for high-wage earners (OECD, 2010). People receiving disability benefits indeed have lower employment and higher unemployment rates than people without it. So the solution could be reform disability benefits to reach better balance between income security and labour market integration of disabled people.

The redistributive effect of unemployment benefits depends on the eligibility criteria and systems parameters. These benefits are conditional on past contributions to the system and are earnings-related in most countries.

In a sample of 34 OECD countries we can identify four groups depending on which mix of transfers and taxes they use (Joumard, Pisu and Bloch, 2012):

- A "Nordic model" characterised by large and mostly universal cash transfers, a high level of spending on in-kind services and a tax mix which promotes redistribution (all Nordic countries and also Belgium are in this group).
- A "Continental European model" characterised by large cash transfers with the lion's share of old-age pension (redistributing income mostly over the lifecycle instead of across individuals) and a tax mix which does not promote redistribution across individuals, reflecting a small role for personal income tax (e.g. Austria, France or Germany).
- An "Anglo-Saxon model" with small cash transfers, and a tax mix which promotes income redistribution. This model can be divided in two sub-groups: In first group, there are countries with transfers highly targeted on low-income groups (e.g. Australia and New Zealand) and in the second group, there are countries characterised by little progressivity of cash transfers which largely spent on old-age pensions (e. g. Japan or the United States).
- A lower-income group, where welfare system is not well developed. Spending on transfers and the level of taxation are considerably below OECD average, and the the greatest emphasis is on consumption taxes (Chile or Turkey).

3   Methodology and data

Our hypothesis is that social spending affect income inequality and its impact is larger than impact of taxes.

Empirical analysis of the impact of social spending on income inequality is based on panel data, which map 34 OECD countries[1]. These represent a relatively homogenous sample of available data, which fulfils the conditions for the use of regression analysis, as noted e.g. by Barro and Sala-i-Martin (2004). The references period is 2000 - 2014. This period was chosen with regard to the possibility of obtaining reliable data for all variables that are included in the model. Since this is a relatively short time series, the authors used panel data regression analysis method and the software E-Views, version 7. This program allows performing all econometric tests, as noted e.g. by Greene (2008). Concretely dynamic panel data model was used, because it solves the problem of inconsistency of estimated variables in the case of infinity observations.

All data was drawn from the OECD databases, which is available online (OECD iLibrary). Although the aim of this paper is to study the effect of social spending on income inequality, we used more explanatory variables. In the general form, the model can be written s follows:

$$GINIa = \alpha_0 + \alpha_1 GINIa_{t-1} + \alpha_2 RGDP_t + \alpha_3 GINIb_t + \alpha_4 WTI_t + \alpha_5 SocSP_t + UNP_{t-1} + \mu_t \qquad (1)$$

In this model, the dependent variable is the Gini coefficient after taxes and social transfers (GINIa) as a proxy of redistributive income inequality. Explanatory variables include real gross domestic product per capita (RGDP) in USD (PPP). Gini coefficient before taxes and transfers (market income) as a proxy of market-generated income inequality. Redistribution is presented through taxes (WTI). In this study we do not need to classify impact of taxes into direct and indirect, so it is possible to use WTI, an overall multi-criteria indicator of the tax burden.

The WTI combines hard tax data available from world-respected sources and national tax laws with soft data expressing Qualified Expert Opinion (QEO). The QEO has been gained from annual large-scale questionnaire survey conducted among tax specialist from all OECD countries. Experts from universities (University of Oxford, Melbourne, or Princeton University), as well as other important institutions (European Central Bank, Austrian Institute for Advanced Studies, Japan Center for Economic Research and dozens of others) have been engaged. Their participation on the project

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[1] There is not available data for Latvia.

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has consisted in determining the weights of individual tax components on basis of multicriteria evaluation methods. The index denotes the total value of the tax burden in relation to other countries under coverage, while higher WTI values indicate a higher tax burden. In the case of the WTI, interpretation of a tax burden does not apply only to the amount of the tax revenue and its relation to GDP, as in e.g. the case of a tax quota. There is a tendency to also include other important, legal above all, aspects in the tax burden evaluation that are connected, e.g. the progressivity of taxation, the administrative demands of tax collection, the extent of tax exceptions, deductions, tax credits, etc. (for more see Machová and Kotlán, 2013).

Impact of social spending (SocSP) is approximated by the share public social spending to GDP. According to OECD methodology social expenditure comprises cash benefits, direct in-kind provision of goods and services, and tax breaks with social purposes. Benefits may be targeted at low-income households, the elderly, disabled, sick, unemployed, or young persons. To be considered "social", programmes have to involve either redistribution of resources across households or compulsory participation. Social benefits are classified as public when general government (that is central, state, and local governments, including social security funds) controls the relevant financial flows. All social benefits not provided by general government are considered private. Private transfers between households are not considered as "social" and not included here. Net total social expenditure includes both public and private expenditure. It also accounts for the effect of the tax system by direct and indirect taxation and by tax breaks for social purposes (OECD, 2016).

Last independent variable is unemployment which is common used in most of the empirical research (Joumard, Pisu and Bloch, 2012; Cingano, 2014 or Koske, Fournier and Wanner, 2012). The stationarity of time sieries of all variables was tested using the unit root test according to Levin, Lin and Chu (2002). At conventional level of significance the non-stationarity was detected in variables approximating real GDP, market income and redistribution effect of taxes. It was removed by introducing the firs differences. Furthermore, with regard to the interpretation of the results, it was necessary to calculate logarithms of the variables. The results presented can be seen as elasticities, which reflect the percentage change in the dependent variable in response to the percentage change in the dependent.

Since the model examines the impact of certain fiscal variables on income inequality that can occur with a certain delay, the model was introduced a one period time delay of these variables. We supposed time delay longer than one year, so we tested other models with time delay of two or three periods, but statistical significant of these lagged variables was not confirmed.

Since the authors performed the analysis using the dynamic panel model, they estimated it using the generalized method of moments (GMM), and used lagged values of the dependent variable as instruments. The suitability of instruments was tested using the J-test. They also used the Arellano-Bond estimator (Arellano and Bond, 1991), which eliminates the risk of endogenity of the dependent variable, which is also the independent variable. To adjust the standard deviations for autocorrelation and heteroscedasticity, the "White Period" method was used.

4   Empirical Analysis Results

Several models were estimated, but due to the insignificance of models with values of fiscal variables lagged more than one period, the estimate results are presented without this influence in Table 1.

The results of this model confirm the inverse relationship between income inequality and social spending, which is statistically significant. The results confirmed the hypothesis that social spending reduce income inequality because increasing social spending lead to a decrease of income inequality.

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Table 1. The effect of social spending on income inequality in OECD countries 2000-2014

Dependent variable ln(GINIa)			
Variables	**Coefficient**	**St. Error**	**t-Statistic**
ln(GINIa(-1))	0.643***	0.028	23.060
d(ln(RGDP))	0.029**	0.012	2.488
d(ln(GINIb))	0.557***	0.027	20.595
d(ln(WTI(-1)))	-0.030***	0.008	-3.826
ln(SocSP(-1))	-0.049***	0.008	-6.194
ln(UNP(-1))	0.017***	0.002	10.285
J-statistic	**28.305**	**Instrument rank**	**34**

NB: *, **, ***; they represent the levels of significance of 10%, 5% and 1%.

Source: OECD (2018), authors' own calculations.

From the theoretical background we know, that the synergy between taxes and social policy is very important but the social spending should reduce income inequality a little bit more than taxes. Our results confirm this hypothesis. We can see that the impact of taxes is not so great. There is the inverse relationship too, so increasing taxes lead to decreasing income inequality. Also this relationship is statistically significant but das we can compare in columns 2 (Coefficient) and 4 (t-Statistic) the impact of taxes on reducing income inequality is weaker then by social spending.

Other variables have expected signs too - in this case the higher is inequality in market incomes (GINIb) the higher is inequality in incomes post taxes and transfers. This fact seems to be not very positive for the role of fiscal policy in reducing income inequality but we have to notify that there are differences between tools of fiscal policy in OECD countries and the worse is starting position the harder is its correction.

A positive, statistically significant, relation was also found between unemployment and income inequality. This was expected. Increasing unemployment causes that incomes are lower, mostly people are reliant on state assistance and what more unemployment affects mainly low-skilled workers so the income inequality increases.

The only one variable, where the sign is different to expectation is GDP per capita. According to empirical studies which determined the effect of income inequality on economic growth, where the impact was negative (lower income inequality has positive effect on economic growth) (see Kotlánová, 2015), we expected the same results in opposite relation but real economic growth is not associated with a decrease in income inequality. It means that the OECD countries are richer, but inequality is also increasing. The reason we can find in a fact, that wealth of the richest increase much faster than in the case of low- income groups and the differences between these two groups are larger. However, statistically significant of this impact is the weakest from all independent variables.

For comparison the same model but without the effect of taxes was estimated. The results we can see in Table 2.

Table 2. The effect of social spending on income inequality in OECD countries 2000-2014, without impact of taxes

Dependent variable ln(GINIa)			
Variables	**Coefficient**	**St. Error**	**t-Statistic**
ln(GINIa(-1))	0.629***	0.022	28.225
d(ln(RGDP))	0.033**	0.013	2.486
d(ln(GINIb))	0.526***	0.034	15.492
ln(SocSP(-1))	-0.042***	0.006	-6.892
ln(UNP(-1))	0.016***	0.001	12.199
J-statistic	**30.621**	**Instrument rank**	**35**

NB: *, **, ***; they represent the levels of significance of 10%, 5% and 1%.

Source: OECD (2018), authors' own calculations.

The signs directions are the same as in the first estimation with impact of taxes. When we compare other results we can see that values of t-statistics increased slightly but values of coefficients decreased (except RGDP) but not dramatically. Therefore, while in the model with the impact of taxes one per cent growth of social spending caused decrease of income inequality approximated by Gini coefficient post taxes and transfers by 0.049 percentage point, in the model without impact of taxes one per cent growth of social spending led to decrease of income inequality by 0.042 percentage point.

5   Conclusion

Rising income inequality in last decades has been problem not only for developing economies but for advanced too. Fiscal policy is the primary tool for governments to affect these problem. There are many ways how to use them. Each country has own experience with different fiscal instruments (expenditures, taxes) and theirs options to help to achieve distributive objectives in an efficient manner.

In this paper we chose social spending as a tool of combating of income inequality and we determined the effect which it has on income inequality. We applied the panel data analysis method to sample of 34 OECD countries in years 2000-2014. The results confirm the impact of social spending on income inequality in the direction we expected because increasing social spending lead to a decrease of income inequality. Results confirmed another fact that is better to combine expenditure and income policy (spending and taxes) because influence of social spending is higher when they are combine with taxes. So both expenditure and tax policy need to be designed carefully to achieve effective results. The mix of instruments will depend on administrative capacity, society's preferences for redistribution, role of state or economic situation of each country.

Acknowledgements

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ANALYSIS OF COSTS AND EFFICIENCY OF THE CZECH ELECTORAL SYSTEM

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Abstract
In recent years, more and more countries are in the so-called crisis of democracy. One of its symptoms is the lack of interest of a growing group of citizens on public affairs, which is reflected in long-term declining voter turnout. However, every election (the public service) in the Czech Republic is relatively costly. The aim of the paper is to create and broaden the view of the perceptions of the election not only as a social problem of the choice theory but also of the cost of the society itself. Motives for people should be, therefore, using their legal rights and to participation not only in order to determine the future direction of the territorial unit in which they live but also to use the public services offered to them by the country. Only then these services can be evaluated as effective and meaningful. Paper deals with the analysis of elections´ costs and its trends. There are analysed most significant cost items and, on the basis of these, the performance indicators (especially number of eligible voters and number of electoral districts and a scope of competence) illustrate the cost inefficiency of public service provision (election), which is paradoxically higher for territorial self-governing units that should realize a higher degree of economies of scale.

Keywords
Costs, Efficiency, Elections, Public Performance, Voter Turnout, Voting.

JEL classification
H11, H41, H72, H76

1   Introduction

Before 1989, the elections were used as a confirmation of power by the ruling Communist Party, and the free competition of other political parties virtually did not exist. The breakthrough came after 1989. Then, the voters could freely decide which political party (on the basis of the electoral program and the vision of the future direction of the country) would support the election. (Kostelecký et al., 2015)

The initial enthusiasm of citizens from free elections in 1990, where voter turnout reached nearly 97%, has been moderating over the next few years. Two years later, the turnout in elections to the Federal Assembly was more than 11% lower, and in 1996, in the elections to the Chamber of Deputies of the Parliament of the Czech Republic, the turnout was approximately 76%. (Czech Statistical Office, 2018) Despite the fact that the elections to the Chamber of Deputies are considered to be the most important in the Czech Republic due to the scope of the legislature, electoral participation in these elections has further decreased and now, almost thirty years from the beginning of free competition of political parties, democratic systems at the so-called crisis point across all Europe. Citizens' interest in political and public affairs is steadily decreasing, this is reflected in the steadily declining electoral participation. Citizens (eligible voters) are skeptical about any change and do not believe that the ruling political elite can be replaced by another, more efficient, more powerful.

The electoral system of the Czech Republic, from the point of view of citizens, consists in coming to the polling station and giving a paper vote to the ballot box. In the Czech Republic unlike most European Union countries, there is no alternative form of voting (e.g. correspondence or electronic) allowed. (Reterová, 2008) Nevertheless, holding elections is very costly. Given that elections are held according to electoral laws irrespective of the electorate's participation on a regular basis, and in terms of process management, different elections do not differ significantly, and the total costs of executing elections are comparable. Over time, especially because of increasing the price level and the pressure on wage growth, these costs are steadily increasing over time. Combined with declining voter turnout, cost-efficiency (measured, for example, by the costs per one active eligible voter) of such an electoral system decreases, under otherwise unchanged conditions.

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2   Literature review

Article 18 of Act No. 1/1993 Coll., The Constitution of the Czech Republic, provides that every citizen who has reached the age of at least 18 years has the right to vote. Decision-making of citizens - eligible voters whether or not to participate in the election depends, in addition, to political conviction or awareness on the importance of the election process also on the circumstances related to their personal life. Specialists in the theory of participation (for example Blais at al., 2004, Feddersen & Sandroni, 2006 or Leduc et al., 2002) agree on a total of five approaches. The first is the theory of resources, which emphasizes the socio-economic factors and the physical ability of the citizen to sacrifice time and money to participate in the elections. The second is the so-called mobilization theory, respectively. The pressures of various social groups, along with the positive and negative mobilization potential of political parties. The third is the theory of a specific context, which can be briefly described as the influence of the importance of the individual elections in the voter's eyes, or even the charisma of the individual candidates. The other two theories deal with the sociological and psychological justification of the electoral participation, which, however, does not necessarily reflect only the objective political interests of voters, but also, for example, their influence on the social environment. (Blais, 2000)

The goal of the government is to provide public goods and services for citizens (including preparation and holding of elections) in the most efficient way (Asatryan & De Witte, 2015) and there are many articles about analyses and possibilities how to improve it. (Bergman et al., 2016) The efficiency of provided public goods can be understood as providing the greatest possible comfort for citizens with a minimum amount or quantity of waste, expense or unnecessary effort. By analogy, in the case of the electoral system, the government should hold elections as a public service in such a way that citizens are actively involved in voting (vote) as cheaply as possible but as efficiently as possible.

From the historical point of view, the measurement of the efficiency of public administration has not been solved by any comprehensive methodology until the 1980s. (Vodáková, 2016) Unlike the private sector, the objective of public administration is not to make a profit. Some researches (e.g. Hood, 1991 or Lynn, 1998) initiated a "new public management" approach that included the introduction of performance benchmarks in the public sector, and these benchmarks (performance indicators) should be complemented by financial indicators. Several years later, in 1992, Robert S. Kaplan and David P. Norton introduces the Balanced Scorecard methodology and adopted it for the performance of public administration. This methodology, which is usually based on the assessment of complex performance according to selected ratios (performance indicators) for individual areas (financial, customer, internal processes, learning, and growth), has been modified for the needs of public administration. The financial area has been replaced by budget management and cost control. (Steiss, 2003) The problem, however, is how to deal with the theory of bureaucracy - the bureaucrat's main goal is to maximize its budget. (Niskanen, 1994) For this reason, the efficiency of public administration cannot be accurately assessed on the basis of the implementation of this budget only, but on the basis of selected key indicators, it is possible to determine which part of the public administration is more effective and which less (if these bodies ensure the same activities).

3   Methodology and data

The paper works with primary elections´ data and information about elections in the Czech Republic (electoral participation data and elections´ costs) published by the Czech Statistical Office and the Ministry of Finance. Because of several types of elections and different voter turnout, costs and other data (number of electoral districts, number of eligible voters in the electoral districts etc.) over time, the elections´ data for the Chamber of Deputies of the Parliament of the Czech Republic from 2010 are used. These elections have the highest turnout in the long run and therefore can be considered as the most important national elections in the Czech Republic.

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The financial data are used to analyze the most important cost items, for each type of municipalities by size, which is defined according to their scope of competence (capital city of Prague – Prague, statutory cities – SC, municipalities with extended competences – III.ST, municipalities with authorized municipal authority – II.ST and municipality with a basic scope of delegated competences – I.ST). The aim is to find out if these costs differ from one municipality to another in the Czech Republic and then if their cost-efficiency differs.

The performance indicators from the financial area of the balanced scorecard methodology are calculated for individual municipalities, and it is determined whether municipalities with a higher number of eligible voters achieve economies of scale, i.e. they have comparable costs per one electoral district and lower costs per one eligible voter than municipalities with a smaller number of eligible voters.

In addition, cluster analysis is performed, thanks to which the individual regions are classified into three clusters. A hierarchical method of clustering with the Euclidean distances of the centroid of each cluster was used. Based on the comparison of these clusters, it is possible to determine whether individual indicators differ from one region to another, and therefore whether some regions are more efficient than others. This analysis, in relation to the results of the indicators for each type of municipality by size (scope of competence), provides a basic idea of which municipalities are less efficient and in which there is room for revision of the spending of public funds.

4   Results

Elections as a basic tool of representative democracy are services provided by the government for about 8.4 million eligible voters in the Czech Republic. At present, a large number of elections are held in the Czech Republic - elections to the Chamber of Deputies of the Parliament of the Czech Republic, the Senate of the Parliament of the Czech Republic, municipal councils, regional councils, the European Parliament, and finally the presidential election. In the course of 25 years there has been a significant increase in the number of elections, since 1993 there have been 23 national elections in the Czech Republic, and over the next eight years, 10 regular national elections are projected. Such a number of different elections give citizens the opportunity to participate very much and quite often but from the point of view of the government, it is a very expensive provision of public service. Since 2010, over CZK 5.2 billion has been spent in connection with the elections in the Czech Republic:

Table 1. Total costs connected with elections in the Czech Republic

Elections / Year	2010	2011	2012	2013	2014	2015	2016	2017	2018[*)]
Parliamentary	516.7	20.3	80.8	489.8	55.0	3.4	42.1	455.5	5.9
Regional self-government units	514.5	34.7	494.1	8.0	491.3	42.4	476.2	6.8	1.1
European Parliament	25.0	0.0	0.0	0.0	450.0	3.7	0.0	0.0	0.0
Presidential	0.0	0.0	0.0	452.8	20.0	0.0	0.0	35.5	466.8
Total	1,056.2	55.0	574.9	950.6	1,016.3	49.5	518.3	497.9	473.9

[*)] Approved budget

Source: Ministry of Finance

The costs of holding elections to the Chamber of Deputies of the Parliament of the Czech Republic ranged from CZK 516.7 million in 2010 to CZK 455.5 million in 2017. At first glance, it would appear that the cost-efficiency of the government provision of this public service is increasing. However, in 2010, the costs were higher, as the elections to the Senate of the Parliament of the Czech Republic were held at the same time. Therefore, elections to the Chamber of Deputies in 2013 and 2017 are comparable. The last elections to the Chamber of Deputies of the Parliament of the Czech Republic were held in autumn 2017. The total costs of CZK 455.5 mil. consisted of costs of the Czech

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Statistical Office (CZK 62.5 mil.), the Ministry of Interior (CZK 48.1 mil.), the Ministry of Foreign Affairs (CZK 1.7 mil.) and the general treasury, in particular, municipal costs (343.2 mil.). The costs of previous elections to the Chamber of Deputies in 2013 was about CZK 34 million higher. The savings were achieved by territorial self-governing units (CZK 42 million), but on the other hand, costs of other institutions (especially the Czech Statistical Office and the Ministry of Interior) increased by CZK 9 million.
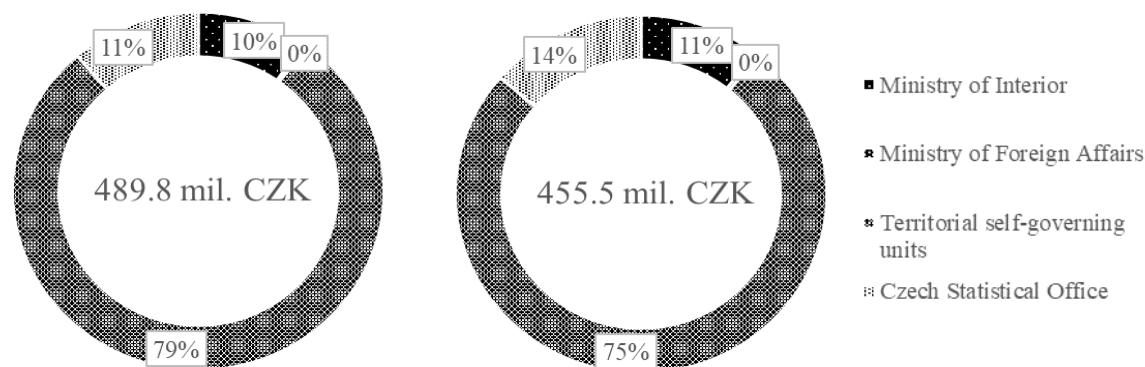
Fig. 1. Total costs – parliamentary elections 2013 and 2017 (Source: Own processing based on Ministry of Finance)

However, the reduction of total costs does not mean an increase in cost-efficiency necessarily. Furthermore, the paper focuses on municipalities' costs and limits the cost-efficiency assessment to their scope of competence level. The following charts show the most significant cost items of municipalities, which are connected with holding elections to the Chamber of Deputies in 2013 and 2017:
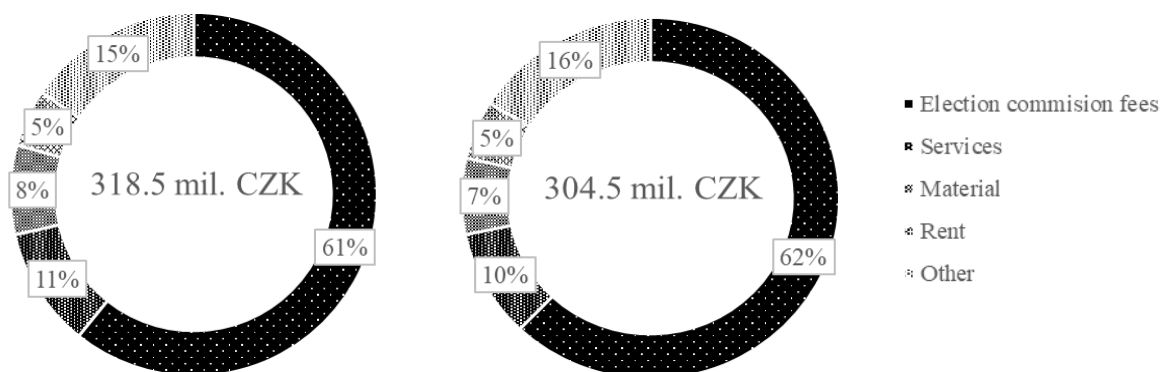
Fig. 2. Total costs of territorial self-governing units'– parliamentary elections 2013 and 2017 (Source: Own processing based on Ministry of Finance)

The largest part of the costs is represented by the election commission fees (approximately 62%), and the cost of services, including rental of computer equipment for the electronic processing of election results (about 10%). Purchase of material or rent is less than 10% overall, however, these costs are generally higher in larger cities.

The following table shows the basic characteristics (number of electoral districts, number of eligible voters and total costs) for elections to the Chamber of Deputies from 2010, broken down by the size of municipalities according to scope of competence (capital city of Prague – Prague, statutory cities – SC, municipalities with extended competences – III.ST, municipalities with authorized municipal authority – II.ST and municipality with a basic scope of delegated competences – I.ST):

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Table 2. Basic characteristics connected with elections to the Chamber of Deputies in the Czech Republic

	Number of electoral districts			Number of eligible voters			Total costs (mil. CZK)		
	2010	2013	2017	2010	2013	2017	2010	2013	2017
I.ST	7,735	7,743	7,757	2,934,285	3,014,948	3,049,018	118.8	122.4	118.8
II.ST	942	944	945	653,882	652,901	645,289	20.0	20.7	19.9
III.ST	2,667	2,669	2,668	1,971,231	1,949,149	1,917,400	63.0	65.6	64.3
SC	2,297	2,294	2,263	1,898,127	1,867,779	1,827,442	70.8	71.5	64.2
Prague	1,126	1,101	1,109	943,459	921,819	916,940	38.9	37.1	36.2

Source: Czech statistical office, Ministry of Finance

Simple key performance indicators - the number of eligible voters per one electoral district, the total costs per one eligible voter and the total costs per one electoral district, shows, that there is only a little change between 2010 and 2017. Smaller municipalities (I.ST) can be less cost-efficient according to the total costs per one eligible voter indicator, because of the legislation in force, according to which every municipality, regardless of the population, have to set an electoral district. In most smaller municipalities, therefore, there is only one electoral district (polling station) for a very low number of eligible voters. On the contrary, in terms of total costs per one electoral district, these municipalities are much more efficient:

Table 3. Key performance indicators – elections to the Chamber of Deputies in the Czech Republic

	El. voters / El. district			Costs / El. voter			Costs / El. district		
	2010	2013	2017	2010	2013	2017	2010	2013	2017
I.ST	369.8	380.3	384.4	72.9	71.8	69.0	15,355	15,704	15,156
II.ST	774.2	770.0	758.6	31.5	32.6	31.4	21,719	22,544	21,158
III.ST	752.7	745.9	736.1	32.4	34.1	34.0	23,476	24,464	23,960
SC	827.2	814.8	802.2	36.3	36.6	34.7	29,847	29,654	27,695
Prague	837.9	837.3	826.8	41.2	40.2	39.5	34,524	33,676	32,674

Source: Own calculations based on Czech statistical office and Ministry of Finance

For example, the total costs per one electoral district in the capital city of Prague are over CZK 32,000, while these costs in small municipalities do not reach even half of this amount. This is evident from the graphic representation:
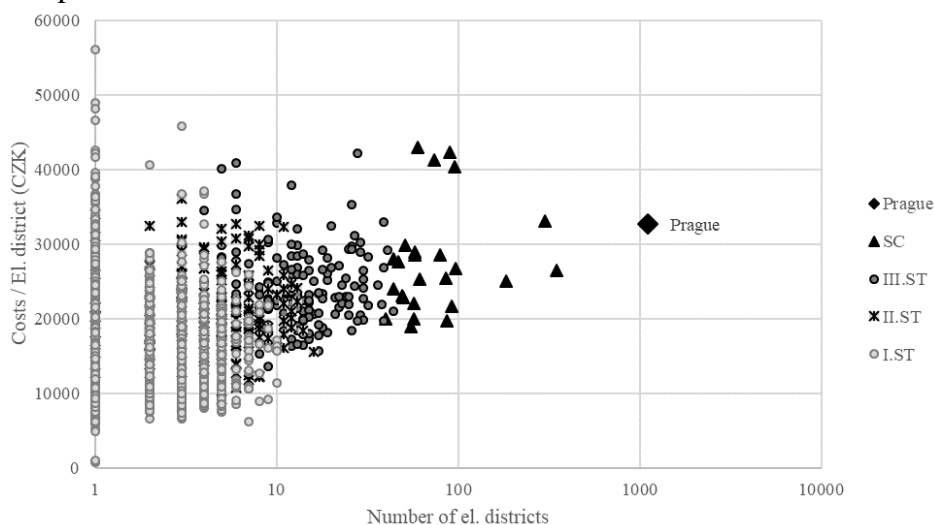

Fig. 3. Total costs per el. district – parliamentary elections 2017 (Source: own processing)

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Paradoxically, significant economies of scale are not achieved with the growing size of the municipality, but vice versa. With larger municipalities spend a much higher amount per one electoral district, they still have higher costs per one eligible voter than smaller municipalities with a maximum of several thousand eligible voters. Because of no significant change of the values of the performance indicators since 2010, this can be described as a trend of cost-inefficiency of larger municipalities - especially statutory cities and the capital city of Prague.

This hypothesis is supported by a cluster analysis aimed at determining whether there are significant differences between municipalities by regions. According to the selected basic performance indicators, a total of three clusters were created:

Table 4. Cluster analysis and performance indicators – elections to the Chamber of Deputies in the Czech Republic in 2017

	Cluster		
	1	2	3
	Prague	Karlovy Vary region, Olomouc region, Zlin region, Moravian-Silesian region	South Bohemian region, South-Moravian region, Hradec Kralove region, Liberec region, Pardubice region, Pilsen region, Central Bohemian Region Usti region, Vysocina region
El. voters / El. district	826.8	569.4	374.0
Total costs / El. voter	39.5	48.2	69.8
Total costs / El. district	32,674.0	18,260.92	15,251.3
El. com. fees / El. district	17,794.8	11,878.6	10,100.9
Services / El. district	4,760.1	1,481.6	855.3
Material / El. district	2,403.3	1,532.2	1,568.5
Rent / El. district	2,200.8	512.1	214.5

Source: Own calculations based on Czech statistical office and Ministry of Finance

The first cluster consists from the capital city of Prague only. This is not only due to the absence of smaller municipalities that would reduce the average number of voters per one electoral district but also because of the significantly higher levels of other financial indicators (the most significant cost items per electoral district). The other two clusters differ more significantly in the number of voters per one electoral district and in several financial indicators (services and rent).

In the context of this and previous analysis, it can be argued that the majority of larger municipalities (especially statutory cities and Prague), in all regions, have room to increase cost-efficiency. If larger municipalities would merge some electoral districts with fewer eligible voters, savings would be made both on the level of election commission fees and on rent or service or material costs. Citizens' (eligible voters) decisions whether or not to take part in the elections would have no effect on this reduction in electoral districts (and polling stations), as their socio-economic costs could remain the same if they were to merge those polling stations located at the same address (e.g. in the same school building, etc.).

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5   Conclusion and discusion

The paper deals with the costs analysis in connection with the holding of elections as public goods (public services) that the government provides for its citizens. This analysis shows that larger municipalities achieve lower costs per one eligible voter, but this is due to the number of voters living in such a municipality. Municipalities with a low number of eligible voters cannot be efficient according to this indicator, as the electoral district have to set up in any case. Therefore, a more efficient efficacy assessment is provided by the indicator costs per one electoral district. The results of the analysis show that larger municipalities have significantly higher costs per one electoral district than smaller municipalities across all regions. Extremely high costs are in Prague as well as some statutory cities, which, on the contrary, should achieve significant "economies of scale" and set up polling stations for a larger number of eligible voters. This would save significant funds not only on the election commission fees but also for rent or paid services.

Contributions that work with electoral systems in terms of their cost-efficiency are very rare. The reason can be the sensitivity of this topic from the point of view that "democracy is not free of charge". Many researchers, however, pay attention to sociological aspects - they examine decision-making and voter preferences (Bowler at al., 2015), or influences that have an impact on voter turnout (Kerr & Lührmann, 2017). The aim of this paper was to create and broaden the view of the perceptions of the election not only as a social problem of the choice theory (Nagler, 2015) but also of the cost of the society itself. Motives for people should be, therefore, using their legal rights and to participation not only in order to determine the future direction of the territorial unit in which they live but also to use the public services offered to them by the government. Only then these services can be evaluated as effective and meaningful.

6   Acknowledgement

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DEMOCRACY AND TRANSPARENT LOBBYING: MEASURING THEIR RELATIONSHIP

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Abstract
In the present paper, we discuss a link between transparent lobbying and democracy. We assume that a better definition and a deeper understanding of attributes of the transparency of lobbying contribute to a more accurate assessment of quality of democracy and might help to develop more complex tools of measurement of quality of democracy in the future. The article proceeds as follows: first, after defining basic terms, we briefly introduce five common indices of quality of democracy and analyze its indicators in terms of transparency requirements. Second, we introduce the results of our existing research and propose a catalogue of measures supporting transparent lobbying. Third, we identify sub-indicators in the five introduced indices of democratic quality related to transparent lobbying and assign a value to each individual indicator in the indices to determine whether measures of transparent lobbying have relevance with respect to these indicators. Fourth, we carry out a rudimentary statistical analysis and discuss it. The analysis produces five findings which are significant for our understanding of indicators of democracy and tools of transparent lobbying.

Keywords
Delphi method, Democracy, Democratic theory, Lobbying, Organized interests, Transparency.

JEL classification
D72, P16

1   Introduction

In 1959, Lipset defined democracy as "a social mechanism for the resolution of societal decision making among conflicting interest groups, which permits the largest possible part of the population to influence these decisions through their ability to choose among alternative contenders for political office." (Lipset, 1959, p. 71) Free and open access to the government is therefore one of the prerequisites for a well-functioning democracy. In reality, however, some individuals or organized groups have greater access to policy makers due to their economic or political power. This power and the balance between and individual and public interests is central to the democratic theory.

In the present paper, we discuss the link between transparent decision-making and democracy. Our aim is to assess measures of transparency in the political process which are relevant for strengthening the quality of democracy and non-corrupt democratic environment. Primarily, we focus on the transparency of lobbying. Similar to Abromeit (1998), Wendler (2002), Goehring (2002), or Warleigh (2003), we do not assume lobbying to be an inherently negative part of the democratic process. In our understanding, transparent lobbying can actually improve democracy as it is a method of access to policy makers and may improve the quality of information processed during political decision-making.

The article is structured followingly: first, after defining basic terms, we briefly introduce five common indices of quality of democracy and analyze its indicators in terms of transparency requirements.

Second, we introduce the results of our existing research (Laboutková 2017; Laboutková and Vymětal, 2017) which focuses on individual measures and sub-processes of transparent lobbying. In that research, we argue that a complex approach combining lobbying rules and other supportive legal measures is needed in order to set up a transparent mechanism of decision-making. We propose a

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catalogue of all pro-lobbying transparency measures with four subgroups involving lobbyists, targets of lobbying, sunshine rules, and monitoring and sanctioning rules.

Third, we identify sub-indicators in the five introduced indices of democratic quality related to the transparency of decision-making and assign a value to each individual indicator in the indices to determine whether measures of transparent lobbying have relevance with respect to these indicators. The values are assigned using a member validation method of triangulation – six members of the research team assign independently, based on their own view and experience, values to individual indicators.

Fourth, we carry out a rudimentary statistical analysis and discuss it. The analysis produces five findings which are significant for our understanding of indicators of democracy and tools of transparent lobbying. A textual analysis of the selected indicators follows.

Finally, the paper concludes with a discussion of the links found between indicators of the quality of democracy and transparent lobbying.

2   The place of transparency in the democratic model

Scholars agree that modern deliberative democracy requires a high level of wide-ranging transparency by its very definition. Fishkin (2011; Fishkin and Luskin, 2005) counts as one of the fifth key elements of deliberative democracy "information" - the extent to which participants are given access to reasonably accurate information that they believe to be relevant to the issue. Habermas similarly argues (1990) that a high-quality deliberative democracy requires that participants fully and honestly reveal the arguments and information available to them. Della Porta (2005: 340) defined deliberative democracy "when, under conditions of equality, inclusiveness and transparency, a communicative process based on reason...". If lobbying means any direct or indirect communication with a public official that is made, managed or directed with the purpose of influencing public decision-making than it is part of this concept and lobbying rules are instruments of deliberative democracy (Chari et al., 2010).

Laboutková (2017) developed this notion when she investigated common denominators in research on the quality of democracy and transparent lobbying. She focused on citizen-related indicators and information-related indicators in indices of quality of democracy. In five most commonly used indices - Freedom in the World (FH), Democracy Index (EIU), Democracy Barometer (DB), WJP Open Government Index (WJP) and Sustainable Governance Indicators (SGI), she identified only two sub-indicators that focus directly on the transparency of communication in decision-making:

1) In the Democracy Barometer (DB) ranking, willingness for transparent communication assesses the transparency of government policy measured on a scale ranging from "The government does not often communicate its intentions successfully" to "The government is transparent towards citizens".

2) In Sustainable Governance Indicators (SGI), scholarly advice indicates effective and legitimate consultation with non-governmental academic experts which should take place during the early stages of a decision-making process, that is, when outcomes can still be altered, and this consultation should be transparent to the public.

The measures of quality of democracy, however, contain other indicators that determine the circumstances of the transparency of the decision-making process in the broader context. In the present study, we select 20 such sub-indicators and assess their relationship with transparency and the impact they have on the quality of democratic governance.

3   A definition of transparent lobbying

Transparent decision-making means reflecting offered views in the final decision and showing which views and why were considered. This concept of decision-making process assumes dialogues between the implementer, stakeholders, and decision makers on all three validity claims: truth/efficiency, legitimacy and authenticity (Wene and Espejo, 1999). This approach is called as pragmatic model for

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decision making, which provides the context for a formal definition of the concept of transparency as was defined by Wene and Espejo (1999, p. 411) "In a given policy area, transparency is the outcome of an ongoing process which increases the stakeholders' appreciation of related issues and provides them with channels to stretch the implementer to meet their requirements for technical explanations, proof of authenticity, and legitimacy of actions. Transparency requires a regulator to act as guardian of process integrity."

We focus on one specific channel of transparent decision-making: lobbying. Lobbying, in our understanding, means any direct or indirect communication with a public official that is made, managed or directed with the purpose of influencing public decision-making and is understood as a legitimate way of interest representation in a pluralistic conception of liberal democracies. Most of the parts of the decision-making governmental process is today sufficiently transparent; yet, lobbying remains to be an opaque activity. In the vast majority of democratic countries, meetings of the government, parliamentary committees, and plenaries are public, or at least their protocols and minutes are publicly available. It is not, however, the case with lobbying. We therefore use it as a measure of completeness of transparent decision-making that separates "*the wheat from the chaff*" in the population of well-functioning liberal democracies.

The existing scholarly work (e.g. Stiglitz, 1999; Lauth, 2016) strongly suggests that transparency of lobbying, i.e. transparency of interactions between decision-makers (public body) and interests (lobbyists), is linked to the core dimensions of quality of democracy, particularly equality and control. Freedom is connected rather with the activities carried out within the framework of constitutional guarantees. Another partial conclusion of the contextual analysis carried out so far is that lobbying activities conceptually correspond to the modern concept of democracy - Liberal-Pluralism and Participatory-Deliberative.

4   Measuring the link between democracy and transparent decision-making

Measuring the quality of consolidated democracies is a young, yet very dynamic field of research, with the number of indices growing considerably (Geissel, Kneuer and Lauth, 2016, p. 571). As has already been stated, there are virtually no sub-indicators directly connected to the transparency of lobbying. The indices of democracy, however, contain some sub-indicators that determine the level of transparency of the decision-making process indirectly. Most of them refer to the so-called sunshine principles. Sunshine principles are one of four categories of the lobbying transparency catalogue created by Laboutková and Vymětal (2017). These principles cover indicators such as participation/equality of participation; access to government information/open government data; disclosure of political funding; obligation of public bodies to consult with citizens and other stakeholders before a decision is made; online platforms for civic participation; systematic monitoring of access to information; data sources relevant for policy analysis; proactive publication of information; equal access to information and documents for all, and others (Table 1).

Laboutková and Vymětal (2017) have further extended their catalogue and identify in total 158 measures, which comprise the four large categories of rules/laws. They also divided these measures into 16 sub-sets linked by types of mechanisms and targets. For the present paper, the basic classification into four categories suffices and a detailed description may be found in Laboutková and Vymětal (2017).

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Table 1. Categories of Transparent Lobbying Rules

Category	Rule/Law
Lobbyists	Register
	Codes of Conduct
	Disclosure of activities
	Codes of Conduct
Targets of lobbying	Revolving doors
	Conflict of interests
	Disclosures of politicians/officials
Sunshine principles	Rules on legislative process
	Rules on decision-making
	Rules on consultations
	Legislative footprint
	Open Government Data
	Political parties funding
	Freedom of information
Monitoring and sanctioning	Oversight
	Sanctions

Source: Laboutková and Vymětal, 2017.

In her previous work, in the six researched indices of democracy, Laboutková (2017) identified only two sub-indicators that focus directly on the transparency of in decision-making processes. However, here, we extend the analysis to identify also sub-indicators, which are not directly, but closely related to the issue of transparency. The entire catalogue of sub-indicators in the five indices of quality of democracy is too extensive to be listed here. We refer the reader to their original sources found in the bibliography of the present paper.

In each of the five indices, we select four sub-indicators (Table 2).

Table 2. Democracy Indices and Transparency Sub-Indicators

Index	Author	Transparency of decision making process-related sub-indicators
Freedom in the World (FH)	Freedom House	• Excessive bureaucratic regulations, registration requirements, or other controls that increase opportunities for corruption. • Implemented effective anti-corruption laws or programs to prevent, detect, and punish corruption among public officials, including conflict of interest. • Accountability of government to the electorate between elections. • Functioning of the government on the basis of openness and transparency.
Democracy Index (EIU)	Economic Intelligent Unit	• Transparency in the process of financing political parties • Exercise of significant political power of special economic, religious or other powerful domestic groups • Sufficient mechanism and institutions in place for ensuring government accountability • Open and transparent functioning of government with sufficient public access to information.

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Democracy Barometer (DB)	Bühlmann et al.	• Willingness for transparent communication • Existence of provision for disclosure of income by political parties. • Existence of provision for public disclosure of expenditure by political parties. • Restriction of freedom of information/barriers for access to official information.
WJP Open Government Index (WJP)	World Justice Project	• Publicized laws and government data • Information requests – quality; timeliness; affordability and trust; general accessibility of information • Right to petition and civic engagement • Complaint mechanisms
Sustainable Governance Indicators (SGI)	Schraad-Tischler et al.	• The capability to formulate relevant policies by economic/non-economic interest. • The extent of informing citizens about government policy making. • Extension of prevention of public officeholders from abusing their position for private interests. • Existence of opportunity to take binding political decisions by citizens

Source: authors own.

At this point of the research, six researchers assigned values from 0 to 3 to each subset of transparent lobbying rules/laws (Table 2), depending on whether they consider these measures could have some impact on evaluation of the sub-indicators of the quality of democracy (Table 3); a higher value equals a more significant effect. These researchers belong to the same research team dealing intensively with this topic for three years and longer and have done deep contextual analysis of each indicator of transparent lobbying and index of quality of democracy. Three of the researchers are economists who have previously worked on economic models of organized interests and their influence in the public sphere. Two researchers are political scientists whose previous research focused on the role of political finance on governmental decisions and public policies. The last researcher has been involved in laboratory experiments dealing with motives and constraints in the free-rider problem and other scenarios involving the (mis)use of public goods. In short, all six surveyed researchers have had extensive knowledge of the studied subject, but their points of view slightly differed. This should at least partially guarantee a certain level randomness in their answers and resistance to one-sided bias.

Our method follows the logic of an expert panel survey method and applies a member-validation method of triangulation. The method is best known for its application in early RAND research groups, where its select models were called "*the Delphi method*" and used to forecast the impact on technology on warfare (Adler and Ziglio, 1996). The method is valued for its generally high levels of reliability, tested over time and with a larger number of survey participants, as well as validity, guaranteed by the extent of knowledge of panel participants. Amongst its known limitations is the tendency to impose a certain bias over the panel by the structure of given questions and options how to answer and ignoring discrepancies in participants' answers. We chose the method for our paper after weighing all its pros and cons. Even though a sample of six experts may not have the same information capability as a larger population of surveyed experts, some trends are clear. These trends are discussed below.

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5   Results of the measurement

Table 3 shows that, first of all, the surveyed expert team considers some indices of democracy closer to the studied subject matter – transparent decision-making – than other indices. The Freedom House metrics is linked much closer to the formal regulations the research project analyses (anti-corruption and transparency rules) than the Democracy Barometer or the Sustainable Governance Indicators metrics. In total, the sum of assigned values was 746 for Freedom House and only 512 for Democracy Barometer. In other words, according to the researchers, the Freedom in the World index and the Democracy Index (EIU) are more dependent on formal regulations than others.

Table 3. Statistical Analysis

Index	Sum of all values assigned by researchers	Standard deviation in all values assigned	% Standard deviation from the sum	Average values assigned by each researcher
FH	746	13.75	1.84	124.33
EUI	747	20.38	2.73	124.50
DB	512	26.12	5.10	85.33
WJP	584	23.24	3.98	97.33
SGI	549	10.56	1.92	91.50

Source: authors own.

Second, some concepts involved in these metrics are rather vague: values assigned them by members of team range from 0 (min) to 3 (max). It concerns, for instance, codes of conduct, which by most members are seen as weak, almost informal rules, but a few members consider them to represent strong limits on officials' or lobbyists' conduct.

Third, members of the team consider hard, tangible, enforceable rules (rules on decision-making, open government data, legislative footprint) to have a more significant impact on democracy metrics than soft rules (codes of conduct, appointment diaries).

Fourth, the members of the research team consider both the sunshine principles category of regulations as well as sanctions more closely linked to democracy indices than rules aimed directly at lobbyists or their targets (of lobbying). Moreover, measures regulating public officials were valued higher than measures targeting lobbyists. Codes of conduct for both lobbyists and targets have the weakest impact on democracy indices. The other side of the spectrum, with the heaviest impact, features freedom of information acts, rules on political finance, legislative footprint, and open government data.

Register of lobbyists is one of the most discussed measure both in theory and in practice with contradictory conclusions. The results of the present research show a similar pattern. Generally, the register has a rather unclear or weak impact on the sub-indicators of the quality of democracy. Its significant positive impact is linked to two sub-indicators of the Democracy Index (EUI): "Exercise of significant political power of special economic, religious or other powerful domestic groups" and "Open and transparent functioning of government with sufficient public access to information". At the same time, it is seen as having only a limited impact on the Sustainable Governance Indicators. It is possible that the strength of the register's impact depends on its concrete form (obligations, types of lobbyists registered, collected data on lobbyists and their clients, update periods, exemptions, etc).

Revolving doors and Rules on Conflict of Interests have a clear impact on "Implemented effective anti-corruption laws or programs" (Freedom of the World - FH) and possible impact on sub-indicators that cover the government accountability or more specifically prevention of public officeholders from abusing their position for private interests.

Measures related to Disclosure of Activities and Open Calendars/Appointment Diaries are marked with having a stronger impact on the side of the lobbied than when applied (only) to lobbyists.

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The group of measurements called sunshine principles features the highest values in terms of their perceived impact on the quality of democracy. Most sub-indicators in the indices of quality of democracy are likely to be affected by the measures of this category.

Measures form the last category – Monitoring and sanctioning – have some impact particularly on sub-indicators from the Freedom of the World index and the Democratic Index (EUI).

6   Conclusion

The paper brings several interesting findings: First, the surveyed scholars believe that regulations or rules targeting public officials have a more significant impact on the quality of democracy than regulations or rules targeting lobbyists. Second, indirect regulations of transparent decision-making, the so-called sunshine principles, are by the panel valued more than other regulations. This is particularly interesting, since many previous works on transparent lobbying tend to overlook or completely ignore such regulations. Our finding suggests that instead of focusing purely on adopted laws on lobbying, research on transparent lobbying should be comprehensive and look at the details of related legislation.

Finally, the present paper highlights the relative vagueness that has dominated the field of democracy quality measurement. The same level of vagueness accompanies research on the variety of formal regulations that are supposed to promote transparency in public governance. Unless we attempt to find more clarity in both, we will keep experiencing difficulties in measuring the real impact of laws on the processes of public decision-making.

7   Acknowledgements

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MEASURING THE TRANSPARENT LOBBYING - A PILOT STUDY FOR THE CZECH REPUBLIC

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Abstract

Lobbying evaluation attract scholars for nearly two decades but the transparency issue is not in the main focus. This article tries to use the authors' conceptual framework for evaluation of transparent lobbying understand in the broader way as a part of the decision making on the case of the Czech Republic. The methodology defines four different areas aimed on lobbyists, targets of lobbying, sunshine principles and oversight and sanctioning and consists of 158 indicators. The Czech case clearly shows that some provisions focusing on targets of lobbying can solve the transparency in a partial way only and that those can't serve as a substitute of rules for lobbyists.

Keywords
Evaluation, Decision-making, Lobbying, Transparency.

JEL classification
D72, D73, D82, D85

1   Introduction

The transparency issue is a principle of so-called "good governance" for nearly three decades. During this period, the intensity and scope of its usage have developed and the area of its application has extended significantly. According to IMF (2018): "*Transparency in economic policy and the availability of reliable data on economic and financial developments are critical for sound decision-making and for the smooth functioning of an economy.*" From the good governance point of view in connection with transparent economic policy in the context of requirement on transparency as a level of disclosure, accuracy and clarity of information and of the assumption of the two types of information, it is necessary to stress the importance of open government data (OGD). Laboutková (2015, p. 81) identified the irreplaceable role of governments in achieving open public data in the desired quality. On the other hand, increasing openness does not automatically lead to increasing transparency (Jetzek et al., 2013; Yu, Robinson, 2012). For the purposes of increasing the transparency of lobbying it is necessary to focus on the political objectives rather than the technological ones. In this context, (it means) mainly dealing with the proactive disclosure of information, equal access to information and documents for all citizens, the obligation for public bodies to consult with citizens and other stakeholders before a decision is made (Laboutková, 2018).

This research contributes also to the opinion on necessity of economic transparency in the wider context of economic development and whose benefits, for example, have been summed up by Barder (2016) as follows: (1) exposing government corruption, (2) reducing the scope for government revenues to be siphoned offshore, (3) increasing collection of domestic tax revenues, (4) increasing the accountability and effectiveness of government spending, and (5) helping to prevent money laundering and terrorist finance.

Economic policy is influenced by a set of institutional elements, including interest groups (lobby). Their influence is closely linked to economic policy because this influential sector directly or indirectly influenced the decision-making process. Data on how many lobbyists are influencing

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politics are presented in Table 1. However, the data are internationally incomparable due to the fact of different definition of what is lobbying, who is the lobbyist and who can be influenced.

Table 1. Number of lobbyists registered in countries with any type of lobbying rules

Country	Form of regulation	Number of registered lobbyists	Lobbyists
Australia	Lobbying Code of Conduct introduced by Government	255	consultants
Austria	Bill	305	consultants in-house corporations in-house organisations
Canada	Bill	5734	consultants in-house corporations in-house organisations
Chile	Bill	n.a.	consultants in-house corporations in-house organisations
France	Bill and Rules of Procedure	n.a. in NA 52 in Senate	consultants in-house corporations in-house organisations
Georgia	Bill	n.a.	n.a.
Germany	Rules of Procedure	2347	in-house corporations in-house organisations
Hungary (2006)	Bill	250	consultants in-house corporations in-house organisations
Hungary (2010)	Bill and Government Decree	-	-
Ireland	Bill	1747	consultants
Lithuania	Bill	64	consultants
Macedonia	Bill	n.a.	consultants
Mexico	Bill	n.a.	consultants in-house corporations in-house organisations
Netherland	Rules of Procedure	104	consultants in-house corporations in-house organisations
Poland	Bill	434	consultants
Slovenia	Bill	63	consultants
Taiwan	Bill	n.a.	n.a.
United Kingdom	Bill	156	consultants
USA	Bill	11529a)	consultants in-house corporations in-house organisations
EP/EC	Inter-institutional Agreement	11793	consultants in-house corporations in-house organisations

Note: a) data available for the year 2017. All other data collected and updated by 31th May 2018 by authors, and the most current official data were used.

Source: National registers and lobbyists' databases, own adjustment.

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Various transparency and/or opacity indicators has been developed for shading the light on specific problem. The issue of transparency is definitely linked with decision-making in public sector and the public policies – in this respect lobbying activities defined mostly as the "communication with decision-makers/public office holder in order to influence their decision" is a part of decision-making, but it is not reflected deeper enough in terms of transparency issue. Although there were some trials to deal with evaluation of lobbying rules (see Laboutková, Vymětal, 2017b, Chari et al., 2010, Newmark, 2017 etc.), transparency of the activity conducted within the regulatory framework is not evaluated. Moreover, those evaluations are too narrow and are not linked to the broader context of decision-making in public sector.

On the other hand, some effort to support discussion about transparent lobbying was provided from the bottom by European NGOs (Access Info Europe, Open Knowledge, Sunlight Foundation, Transparency International) from 2015 (for summary see Laboutková, Vymětal 2017a) supported also from above by OECD (2010) and the most recently by the Council of Europe (2017).

This article summarizes two years research in the area of transparent lobbying. For the first time we propose a comprehensive catalogue for transparency of lobbying that we think is able to: (1) extend the evaluation by combining both legal and voluntary rules and practices on lobbying; (2) extend the importance of lobbying by including targets of lobbying and the sunlight principles and rules that can indirectly shed the light on lobbying and decision-making process; and finally (3) evaluate the lobbying transparency in a more "plastic" picture rather by addressing the strictness of legal regulation. As an extension, the published catalogue and all indicators are tested at one country – the Czech Republic.

2 Categories of lobbying transparency indicators

The purpose of lobbying regulations is/the regulation of lobbying should achieve: (1) restrictions on lobbying, or reduce its intensity; (2) fight against the risks of its intersection with corruption; (3) introduction of transparency into lobbying practices and thus open the political process to external actors; (4) and the recognition of lobbying as a legitimate and useful part of the political process (Vagovčíková, 2011).There are various approaches to how to classify the rules (Chari et al. 2010; Chari, Murphy, 2006; Kalnins, 2005; Griffith, 2008 and others).

The variety of measures has different reasons – jurisdictions focus on different features and characteristics of lobbying to define the basic rules. First, for effective regulation, systematic regulation should be introduced. In form, there can be legal rules (hard rules) as well as self-regulatory approaches. Second, for vibrant regulation, both the direct rules (for lobbyists) and indirect rules (for targets of lobbying – politicians and civil servants) and therefore both sides of lobbying activities shall be covered. Third, the rules for lobbying are not covered by only a single bill; rather, it is a series of complementary legislation (legal provisions), internal and procedural rules (system arrangement) and institutional mechanisms (as distinguished, e.g., by TI UK, 2015). A linkage between selective and narrowly aimed rules in the light of the systemic approach to lobbying regulation is needed. Fourth, effective control of lobbying activities shall be independent and under the public scrutiny.

The catalogue of transparent lobbying reflects a broader methodological approach by combining written and unwritten rules for lobbying and partly for decision making, and focusing on main relevant stakeholder in the playing field (lobbyists, targets of lobbying, oversight bodies). At the end, there are four areas of lobbying transparency decomposed for practical reasons in 18 groups (chapters) that are filled by 158 indicators as presented in Table 2.

In the text, a reference identified by means of an author's name should be followed by the date of the reference in parentheses. If there are more than three authors, only the first author's name should be mentioned, followed by 'et al'. In the event that an author cited has had two or more works published during the same year, the reference, both in the text and in the reference list, should be identified by a lower case letter like 'a' and 'b' after the date to distinguish the works. References should be listed at the end of the paper in alphabetical order.

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Table 2. Main categories of lobbying transparency and number of indicators identified

Category	Groups	Data/information	Number of Indicators
Lobbyists	1	Register	14
	2	Codes of Conduct	8
	3	Disclosure of activities	9
Targets of lobbying	4	Codes of Conduct	14
	5	Revolving doors	7
	6	Conflict of interests	5
	7	Disclosures of politicians/senior public employees	12
Sunshine principles / Sunshine rules	8	Rules on legislative process	17
	9	Rules on decision-making	6
	10	Rules on consultations	10
	11	Legislative footprint	6
	12	Open Government Data	12
	13	Political parties funding	8
	14	Freedom of information	10
Monitoring and sanctioning	15	Oversight	7
	16	Sanctions	13

Source: Based on Laboutková, Vymětal (2017b), authors' changes.

There is no evaluation of the transparency of lobbying rules in terms of decision-making process, or more precisely a question what provisions supporting transparency of decision-makers have to be taken into an account when speaking about transparent lobbying. Authors' aim is to overcome those deficiencies in the current research and propose a new design of catalogue on lobbying transparency that have the ambition to evaluate the lobbying in the broader scope. For testing the results, the Czech Republic was chosen as a single case for evaluation and present the results in more summary and comprehensive way below.

3   Catalogue of lobbying transparency and the Czech Republic - unsurprising results?

Before we present the result, a short methodological note should be presented. The indicators of evaluation are based on the existing rules, processes and practices in the country. We do not specifically differentiate between domestic and foreign lobbyists, nor the form of publication of the information (printed or online). Majority of indicators' evaluation is based on hard data - rules, measures, specific numbers (e.g., day length, number of lobbyists) – that are expressed in the form of any document and/or officially published data. Majority of questions was intended to be formulated in the way that the responses should be "yes"/"in place measure" (positive evaluation) or "no" (negative evaluation); unfortunately, we have sometimes also use the answer "partly" for those cases where some halfway efforts were taken, and "n.a." where this criteria is not applicable and/or information is not available (e.g., number of lobbyists where there is no register at all).

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Table 3. Lobbying transparency evaluation for the Czech Republic

Category	Groups	Data/information	Number of Indicators	Number of "yes"	Number of "no"	Other answer ("partly", "n.a.")
Lobbyists	1	Register	14	1	10	3
	2	Codes of Conduct	8	3	4	1
	3	Disclosure of activities	9	0	9	0
Targets of lobbying	4	Codes of Conduct	14	9	3	2
	5	Revolving doors	7	0	4	3
	6	Conflict of interests	5	5	0	0
	7	Disclosures of politicians/senior public employees	12	3	4	5
Sunshine principles / Sunshine rules	8	Rules on legislative process	17	14	2	1
	9	Rules on decision-making	6	1	2	3
	10	Rules on consultations	10	2	3	5
	11	Legislative footprint	6	0	5	1
	12	Open Government Data	12	6	2	4
	13	Political parties funding	8	5	3	0
	14	Freedom of information	10	6	1	3
Monitoring and sanctioning	15	Oversight	7	2	4	1
	16	Sanctions	13	4	6	3
Total	-	-	158	61	62	35

Source: Authors.

Table 3 comprehensively present the results of lobbying evaluation on the Czech Republic. In general, nearly two fifth of the indicators are fulfilled and/or have been already introduced, but the same amount of indicators is still missing. One fifth of them is introduced partly and/or the indicator is not available or not appropriate. Essentially, there are two areas that scores relatively bad – it is the area of a) lobbyists, and b) monitoring and sanctioning. The first area dealing with lobbyists themselves only (4 "yeses", 22 "noes" and 4 "partly"/"n.a.") and the very low score is a result of no rules in place in the Czech Republic – in many studies those rules are supposed to be the main measures that drive and force subjects for compliance and limit the lobbyists behaviour. The second one is monitoring and oversight (6 "yeses", 10 "noes", 4 "partly"/"n.a.") mostly about the information on lobbying activities.

The results deserve a deeper analysis. As noted above, first area deals with lobbyists and rules for lobbying. Due to the missing regulatory framework in this area, the bad scores (it means "noes") were expected. There is *no register* and the only one positive result for voluntary association for Public Affairs companies (APAA). The problem is, it covers only 6 companies with maybe dozens of lobbyists and the vast majority of the sector (the estimation varies from hundreds to one thousand of lobbyists) is left unregulated. Second group was linked to the *Codes of Conduct* (Codes of Behaviour, Codes of Ethics) in the lobbying industry. While the first group of indicators is connected mostly with the hard law and is set from above, rules in the second group is mostly introduced from the bottom by the lobbyists themselves (if we omit the Canadian case). The APAA is based on a voluntary membership and has introduced an own Statute and internal mechanisms for compliance in 2012 – for that reasons the second group was evaluated as the best within the area of rules for lobbyists/lobbying. Contrary to this, third group of indicators (*disclosure of lobbyists' activities*) was the worst one – simply no rules in this area mean also only minimum information on the activities and only voluntary approaches of low number of lobbyists can be found.

The second area of indicators on the other hand deals with all rules and measures that in terms of lobbying can be addressed to the targets of lobbying (politicians and public office holders). The

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results were surprising also due to the fact that many of those measures are not primarily dedicated and linked to the lobbying. The fourth group covers the *Ethics for public sector* where sometimes requirements for representing third parties' interest, meeting lobbyists etc. can be addressed. The most important regulation is represented by the Conflict of Interest Act, followed by Codes of Behaviour for public sector employees. The main failure in this respect is there is no specific Code of Ethics for Members of Parliament, nor for Ministries - just those who are at the front line in lobbying activities. Fifth group of measures on the other hand is frequently linked to lobbying - the *revolving doors* issue, especially regulation of post-employment separation. There are no specific rules on this issue in the Czech Republic and only partial rules can be found in the Conflict of Interest Act (one-year ban on contracting the Government after leaving the office) but it is not linked to lobbying at all. Sixth group narrowly deals with *conflict of interest* in terms of potential corruption risks such as receiving gifts, hospitalities etc. scores positive in all indicators maybe due to the fact it is simply regulated at the general level by the law (Conflict of Interest Act). The seventh group with *politicians' and public sector employees' disclosures* (appointment diaries included) is rated as the worst one again. Besides the first three sub indicators that are regulated by the aforementioned law on Conflict of Interest, there are no such publicly available data and if there is yet any, it is only voluntary, fragmented and bringing different scope and content. In the public sector there are some internal general regulatory mechanisms of official records about meetings (minutes) but they are not publicly available and their scope differs from the requirement of monitoring contacts with lobbyists and pressure groups. In sum, this second area is for the Czech Republic evaluated as promising (17 "yeses", 11 "noes", 10 "partial"/"n.a.") - key general rules and regulations were set (especially by the Conflict of Interest Act), but there is still a lack of data publishing and especially data linked to lobbying itself by those in office. It is worthwhile to notice that the existing gap that exists in the area of targets of lobbying is the missing regulatory framework on lobbying itself.

The third area of indicators is linked to the more general issue of sunlight regulation and sunshine principles introduced at the general level of decision making. The lobbying is a way of influencing the decision-making process and its result and the rules in third area establish also the level playing field for lobbying as well as. The eighth group introduces the rules on *legislative process*, the main tiltyard of lobbying in liberal democracies. Basically, all countries have any rules who introduces the law, basic procedures, but still there are many aspects that can be linked to the lobbying only. The Czech Republic scores in this respect pretty well, however there are some unclear and/or gaps in the law-making process, mostly at the governmental phase of law-making. As the main failure we can evaluate the missing corruption impact assessment that is done randomly and it is not an integral part of the legislative process and where potential unethical lobbying and interest representation problems can appear. Nineth group is focusing on *decision making* and information published at the Governmental level (Office of the Government) only. Very often, there is limited amount of information and if there are it is often provided ex-post. Tenth group aims on the process and rules for *consultations* with governmental bodies. Unfortunately, the process is mostly associated with RIA process only and there is limited amount of information available to the public. The thirteenth group includes the ex-post listing of subjects that actively participated in the decision-making process. The *legislative footprint* is primarily used in the legislative process (e.g., European Parliament), but it can be used also in other areas; in the Czech Republic it is not used. All those three listed groups of indicators are definitely evaluated as the worst ones within the third area.

The twelfth group of indicators covers the *open government data* - databases that are published by the government and are available. Almost half of indicators are positively evaluated, although there are still gaps in order to provide transparent environment - most notably that only a few data is available to the public. Thirteenth group is associated with the *political parties' funding* as a potential way how the lobbyists and lobbying activities can be misused and can lead to corruption behaviour. The Czech Republic made a significant step to more transparency in the political finance although there are some problematic issues. The negative evaluation in this group is caused by missing

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regulatory framework on lobbying and therefore lobbyists are not specifically regulated in this issue compared to the other subjects. *Freedom of information* is a core of the fourteenth group of indicators that reflects the opportunity of the public to ask the public institutions for specific information that is not protected an/or limited by the law. In the Czech Republic the provision is regulated by a special law adopted in 1999. This group is evaluated mostly positively but some gaps still exists (no sanctions for denial of providing information and the lawsuit then take many months). Over all, the third area in the case of the Czech Republic is on the halfway - there are some important problems regulated but many other are not fulfilled and/or not fulfilled enough to set a transparent environment for decision making (34 "yeses", 18 "noes" and 17 "partly"/"n.a."). Some of them are result of missing rules on lobbying, some other reflects the political will to shed more light in decision making.

The fourth area of monitoring (oversight) and sanctioning is evaluated as weak in the case of the Czech Republic. The fifteenth group focus on oversight bodies across areas associated with lobbying (lobbying, revolving doors, political parties) monitoring the behaviour and compliance of lobbyists. As many times above, due to the missing rules those mechanisms are not introduced except the oversight body over political finance. The last - sixteenth - group covers various *sanctions* that can be introduce in order to issue compliance and punish those who breach the rules. The lobbyists are not sanctioned only if they breach other laws. In some other areas there are penalties also for the politicians and POHs but sanctions are not used specifically when taking in the relationship with lobbyists.

4   Conclusions

For the effective functioning of economic policy, the institutional framework defining economic policy needs to be set up in a good way. One of the elements of this framework are interest groups and lobbying that is closely related to them.

It is possible to conclude that (1) lobbying is a legitimate and potentially beneficial activity, (2) existence of resistance by individuals, firms and politicians with particular interests that benefit from secrecy, (3) free and open access to government is necessary for a functioning democracy and (4) lobbying must be carried out transparently and ethically.

The article used authors' developed methodology of measures of transparent lobbying for evaluation of the Czech Republic. As the research shows, Czech Republic has nearly two fifth out of 158 in place and one fifth of measures that are fulfilled partially and/or not applicable at this moment. For the transparency of lobbying as we have conceptualized it means some basic environment is established and if the rules exists, the targets of lobbying and/or general rules on decision making is in place – therefore, if we can speak about any transparency of lobbying according our methodology, it is caused by non-of-lobbyists rules – the missing regulatory framework aimed on lobbyists and lobbying activities will definitely improve the results and we believe also the lobbying and decision making environment from the transparency point of view.

The highlights recommendations for the policy in the Czech Republic are following:
- for lobbyists – the regulatory framework should be adopted, particularly *mandatory register* and rules on *disclosure of lobbyists' activities*;
- for targets of lobbyists – to elaborate *Code of Ethics* that would targets directly the MP and members of government, regulation of *post-employment separation*;
- for the broader context of transparent decision-making – to implement *legislative footprint*, the political representation should not hesitate to *open relevant data* focusing on political objectives not just technological ones, i.e. the *public registries of corporate beneficial ownership*; the register is not a public register within the meaning of the Register Act;
- for monitoring and sanctioning – these tools can be implemented and then evaluated for their functionality only if there are mandatory rules. As already stated above, the regulatory framework for lobbying missing, as well as a number of other measures related to it.

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5   Acknowledgement

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ISSUES OF PUBLIC ADMINISTRATION IN THE EU COUNTRIES: A CASE OF COVERING COMMITMENTS OF MUNICIPALITIES IN THE MORAVIAN-SILESIAN REGION

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Abstract
Municipalities may find themselves in a situation when they do not have sufficient financial resources to cover their investment expenses and expenses for the routine maintenance or the development of their territory. They must look for foreign resources, either in the form of refundable or non-refundable funds, which can lead to the indebtedness of municipalities. Whether or not this debt is incurred, can be ascertained through the burden on the total assets of the municipality by external sources, i.e. the level of the coverage of commitments. This paper analyses the above-mentioned issue of all 300 municipalities of the Moravian-Silesian Region in the period 2010-2016. For this purpose, two indicators were selected and analysed - the share of foreign resources in total assets, including subsidy advances, and the share of foreign resources in total assets without subsidy advances. It was assumed that subsidy advances play an important role in the covering of commitments and have a significant impact on how municipalities are assessed in this respect. Based on the analysis, it was found that the coverage of commitments is not a problem for the municipalities of the Moravian-Silesian Region, both with or without the subsidies.

Keywords
Foreign sources, Indebtedness, Municipalities, Subsidy advances, Total assets.

JEL classification
H74, H83, O18

1 Introduction

Municipalities, like businesses, may find themselves in a situation when they do not have sufficient own financial sources to cover their expenses in the form of construction, infrastructure reconstruction and routine maintenance, or spending money on the development of their territory. They have to look for foreign resources, either in the form of non-repayable or repayable funds, while these subsidies, loans and bonds can have both positive and negative impacts. The foreign resources lead to an improvement of the look and the quality of life in the municipalities, and an enhancement in the productivity of economic activities. On the other hand, there may be negatives - the debt repayment and the interest payment, which may be high and may lead to the inability of the municipality to meet its obligations. Municipal property held in pawn may result in execution or auction and fall into a non-public entity, thereby destroying its original purpose, and the municipality will not be able to provide its citizens with basic services anymore.

The use of public resources must, therefore, be monitored and controlled. In the Czech Republic, this monitoring and control are carried out by the Ministry of Finance, especially in connection with the budgetary responsibility, which is stipulated in the Act No. 23/2017 Coll. (The Budget Accountability Act). In addition, an emphasis is put on adherence to the set limits in case of coverage of asset and liquidity liabilities.

The authors of this paper analysed the situation regarding the coverage of commitments of all 300 municipalities of the Moravian-Silesian Region, both with and without subsidy advances. They also investigated whether this issue is a problem for the municipalities. For this purpose, two indicators

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were selected: the share of foreign resources in total assets (hereinafter CZCA), which expresses the coverage ratio of commitments on total assets. The second indicator selected is the share of foreign resources without subsidy advances on total assets (CZCA1), which regulates the previous indicator by subsidy advances, which can be a significant item of foreign resources. These indicators measure the burden on the total assets of the municipality by external sources and thus indicating whether there is an excessive debt.

Both indicators were the subjects of research with the assumption that the subsidy advances play an important role concerning the extent of coverage of commitments and have a significant impact on how municipalities are evaluated in this respect. The municipalities were monitored over a period of seven years, from 2010 to 2016. For the purposes of this paper, data were collected both from the primary research and from the publicly available resources of the Ministry of Finance (the so-called information and monitoring indicators SIMU). The resulting data were aggregated into a group of municipalities with a low-risk, a medium-risk and a high-risk financial instability.

The paper is structured as follows: The first part deals with the summary of researches of the given issues in domestic and foreign literature, the second part of the paper describes the evolution of the indebtedness of the municipalities and the state of coverage of their debt in the years 2010 to 2016. The third part deals with a chosen methodology for assessing the debt issue, in particular assessing the level of coverage of commitments. The penultimate part is devoted to the analysis and results of the selected indicators in the municipalities of the Moravian-Silesian Region. In conclusion, the knowledge elaborated in the previous part is summarized.

2   Literature review

Researching the specific coverage rate of assets by foreign resources is far from being addressed by experts. In addition to the aforementioned monitoring by the Ministry of Finance of the Czech Republic and the INECO system in Slovakia, based on similar indicators such as SIMU MFČR (authors Goliaš, Klátik and Tunega, 2017), Halásek, Binek and Legátová (2005 and 2006) include in the asset ratings the indicator of the share of foreign resources in the total assets. Also, Opluštilová (2012) used the indicator of the share of foreign resources and total assets as one of the four indicators of indebtedness in the comprehensive assessment of the financial health of municipalities.

Many authors address this issue through the related area of financial management of municipalities. For example, Mantzaris (2014) argues that financial viability is measured in terms of the ability of a community to meet its financial obligations in a sustainable manner. Ochrana, Půček and Plaček (2018) concluded that good financial management practices are central to the sustainability of the municipality. Pakšiová (2016) confirms that Corporate social responsibility has a significant impact on the envieronment, quality of life of community where operate. It is important to understand the financial management of municipalities because it includes a number of factors such as budget planning and budgeting, revenue and cash management, cost management, procurement and asset management. If the financial management of the municipality is disorganized, its resources may be misdirected and misused, resulting in poor service delivery and an increased risk of corruption. The demand for the economy, efficiency and effectiveness that communities have to respect is, according to Peková (2008), or Kadeřábková and Pekové (2012) the mission of the municipality.

Halásková (2013) argues that the quality of securing public goods is the basis of the financial health of the municipality. Otrusinová and Kubíčková (2011) considered the ability to pay the due commitments as one of the aspects of assessing the financial stability and health of the municipalities. Halásek, Pilný and Tománek (2002) and Binek et al. (2007) argue that municipalities need to be financially stable and healthy. Kršeková and Pakšiová (2014) draw attention to the importance of long-term fiscal sustainability of public sector entities` finances. Žárská (2009) emphasizes the interdependence of financial stability and responsible financial management, financial stability in connection with the financial autonomy of municipalities in Slovakia is presented by Poliak (2016).

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Tkáčová and Konečný (2017) created and researched thirteen indicators of financial stability in regional cities in Slovakia.

In foreign countries the problem of the coverage of commitments is dealt with by means of the issue of financial stability and financial health and has been analysed for almost sixty years. According to Groves, Godseye and Shulman (1981), financial stability is a long-term ability of (local) governments to pay the costs of their work, and the system of financial trends FTSM with 12 indicators (financial, environmental and organizational) has been implemented in the US for its monitoring. According to Cohen et al. (2012), an expression of financial stability of the municipalities is the ability of municipalities to fulfil their financial obligations and their services to satisfy their citizens. According to Honladel, Costa and Cigler (2004), financial stability is closely linked to financial health issues. Hendrick (2004) analysed financial health in Chicago, where she developed an open system model with three dimensions (environment, the balance of fiscal structure with the environment, and fiscal structure properties). Padovani, Rossi and Orelli (2010) examined the Italian municipality from this point of view. Financial health in terms of sustainability dimension and vulnerability flexibility was dealt with by Cabaleiro, Buch and Vaamonde (2012) in five thousand municipalities in Spain. Similarly, Wang, Dennis and Jeff (2007), Rivenbark, Roenigk and Allison (2010), Ritong, Clark, and Wickremasinghe (2012) have chosen a similar approach to explore the issue through financial analysis.

Financial stability and the impact of the crisis were examined by Lopez-Hernandez, Zafra-Gomez and Ortiz-Rorriguez (2012) on a sample of more than two thousand municipalities. In context of the economic and financial crisis, the issue of the occurrence of negative tendencies called fiscal distress or crisis (Kloha, Weissert and Kleine, 2005 or Coe, 2008) was also investigated.

3   The development of assets and foreign resources of municipalities of the Czech Republic

Adrian, Covitz and Liang (2015) highlight the need for rigorous monitoring and efficient use of public revenues. In the Czech Republic, the Ministry of Finance (MFČR, 2017) performs the monitoring, on the basis of the Resolution of the Government of the Czech Republic No. 1395 dated 12 November 2008 about the monitoring of the management of municipalities. The ministry calculates and evaluates the results for all municipalities and their contributory organizations through a system of information and monitoring indicators (SIMU), which consists of 18 financial indicators (excluding population). A special attention is paid to the two indicators (apart from budget responsibility), which are an indicator of the level of foreign sources coverage and liquidity. The above-mentioned indicators assess the burden of the total assets of the municipality by external sources and therefore indicating whether there is an excessive debt. This paper discusses the first one, the analysis of the other one will be the subject of a further investigation.

The issue of self-government indebtedness is related to the territorial division and organization of the self-government system. In the Czech Republic, the number of municipalities is high, these municipalities have a small population and are more often subject of financial pressures as their investment often exceeds the budget of the municipality multiple times. The solution is the reform of the public administration, which will reduce the number of local government units, as it was done in Estonia, for example. (Smetanková, 2018) More than a half of the municipalities in the Czech Republic are currently indebted, which was mainly caused by financially demanding public investments without necessary financial resources for debt repayment after 1990, by municipal co-financing for investment subsidies, management inexperience or easier borrowing compared to the private sector.

When studying the development of total assets and foreign resources of municipalities between 2010 and 2016, the assets were higher than liabilities, except for the year 2012 when foreign resources of the Czech Republic were higher than total assets (due to a fivefold increase in the value with respect to assets in the Southwest region). This development is shown in Figure 1. Here, we can see a

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significant decrease in the values of both items in 2011, which was caused by the depreciation of municipal property.
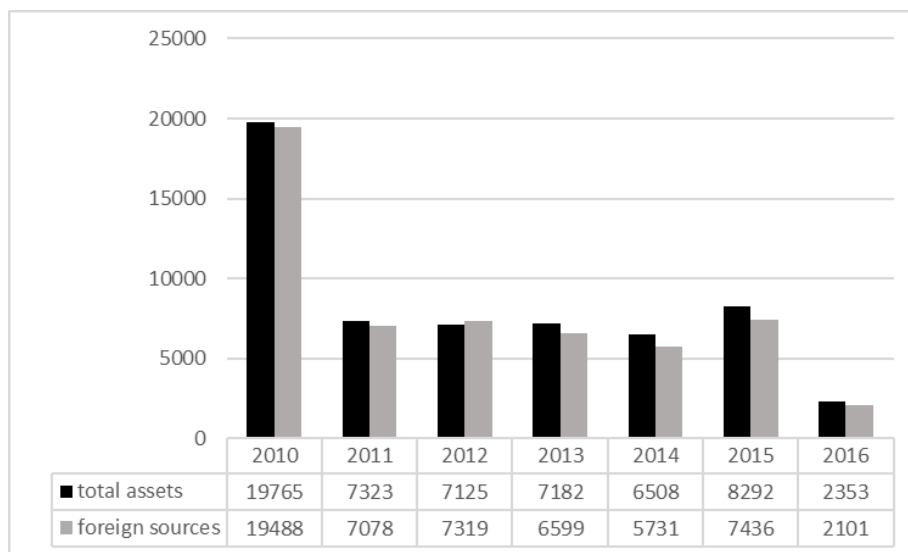

Fig. 1. The development of assets and foreign resources of municipalities in 2010-2016 (in billion CZK) (Source: authors own according to MF, 2018)

The proportion of total assets covered by foreign resources should not exceed 25 per cent according to the criteria set by the Ministry of Finance. The number of municipalities that exceeded this limit in the monitored period between 2010 and 2016 is shown in Table 1. Currently, the highest values are reached by the municipalities of Turovice (709%) and Sources (224%), which are significantly threatened by insolvency. Although the principle of budgetary accountability is considered as the primary indicator of monitoring, the evaluation of the indicators of the share of foreign resources in total assets and total liquidity is essential for the assessment of the overall economic situation (MF, 2018).

Table 1. The development of the number of risky municipalities in the Czech Republic in 2010-2016

Indicator	2010	2011	2012*	2013	2014	2015	2016
Municipalities	6243	6243	6244	6248	6248	6248	6254
Risky municipalities	62	84	47(83)	154	155	226	122
%	0.99	1.35	0.75(1.33)	2.46	2.48	3.62	1.95

Note: * in 2012 there was a change in the methodology that influenced the number of risky municipalities (the data in brackets indicate the status without this change)
Source: MFČR (2018).

In the Czech Republic, the number of risky municipalities did not decrease in the monitored period, except for the last monitored year 2016. It should be noted that the comparison of the years 2010 to 2012 is somewhat problematic, because in 2011 there was a depreciation of municipal property and in 2012 there was an adjustment of the calculation methodology of the given indicator CZCA (data in parentheses means calculations according to the methodology used until 2011), which affected the resulting values and the number of municipalities. The worst situation occurred in 2015, when more than 3.6% of the municipalities were in the group above 25%. Although the percentage of municipalities declined in the following year, their number still did not come close to the number at the beginning of the reference period. The high values of this indicator are due to predominantly mandatory pre-financing of investment projects for small municipalities in the long run to which the municipalities have been promised support from the EU funds. (MF, 2017)
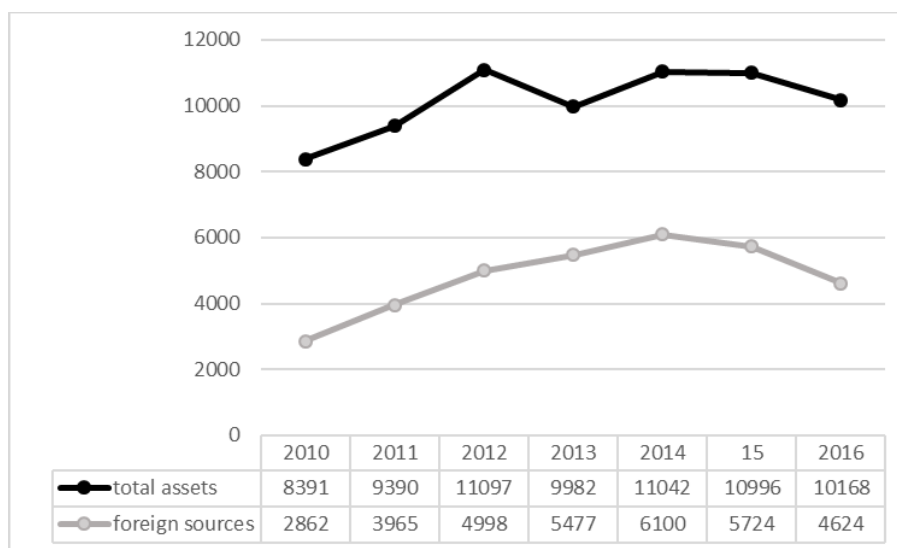
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	2010	2011	2012	2013	2014	15	2016
total assets	8391	9390	11097	9982	11042	10996	10168
foreign sources	2862	3965	4998	5477	6100	5724	4624

Fig. 2. The development of assets and foreign resources of municipalities of the Moravian-Silesian Region in 2010-2016 (in billion CZK) (Source: authors own according to MF, 2018)

The development of assets and commitments of municipalities in the Moravian-Silesian Region is shown in Figure 2 which indicates that on average the municipalities of this region have no problem covering their assets. Yet, if we look at the results of the various municipalities, the situation is different in this area (see the following section).

4   The methodology of evaluating the coverage rate of municipal commitments as part of the debt issue

The burden of total assets by external sources leads to the debt of municipalities and the degree of coverage thus becomes a part of the municipal indebtedness problem. For the purpose of the project that resulted in this paper, a total of eight indicators were developed and used to address the issue of municipal indebtedness (see Szarowská, Majerová and Šebestová, 2018). Most of them are based on the SIMU, yet some have been modified like one of the analysed indicator of the share of foreign sources on total assets (without subsidy advances). The reason was to eliminate the distortion of the results based on their (advances) providing.

Below is a detailed overview of the debt ratios, including the values they can reach and the limits in which the municipality is considered financially (un)stable:

1. The ratio of the total debt to the current budget balance (CDSBR) that expresses the number of months the municipality is able to pay debts from its current balance, and shows the activity of the municipality and its approach towards the planning of its commitments and their possible repayment.
2. The Debt Service and Debt Capacities (DSSBR), which expresses how the municipality is able to cover its liabilities from the current budget balance
3. The share of paid interest and debt capacity (PUSBR), where the indicator expresses how the municipality is able to cover interest costs from the operating balance (it is a supplementary indicator to the DSSBR indicator)
4. The share of foreign resources and total assets (CZCA) shows the coverage ratio of total liabilities (total assets)
5. The share of foreign resources without subsidies and total assets (CZCA1), which expresses the coverage ratio of total assets (total assets) without subsidies (this is a modification of the previous indicator when foreign resources are cleared of subsidy advances).
6. The share of the total debt on foreign resources (DCZ) showing how the total debt of the municipality is shared by foreign resources (additional indicator for the above two indicators)

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7. Total Debt Service (DSC), which expresses the extent of coverage of the total municipal debt by consolidated revenue in the given year
8. The ratio of Total Debt to Current Income (DBP) represents the coverage rate of the total municipal debt of the current income in the given year (it is an additional indicator for the DSC indicator).

As it was mentioned in the introduction, two (out of eight) debt ratios, namely the share of foreign resources on total assets (hereinafter CZCA) and the share of foreign resources without subsidy advances on total assets (CZCA1), were the subjects of research. These indicators measure the burden of the total assets of the municipality by external sources and therefore expressing whether there is/is not an excessive debt. These indicators were tested and calculated for all 300 municipalities in the Moravian-Silesian Region.

The first analysed CZCA indicator reflects the coverage ratio of the total assets (total assets) and was calculated on the basis of the established relationship (1). The second indicator of the CZCA is created by the modification of the first indicator as the authors consider that the subsidy advances in high financial amounts can significantly influence the coverage rate of municipal commitments. This indicator was calculated based on the relationship (2).

$$CZCA = \frac{foreign\ sources}{total\ assets} \tag{1}$$

$$CZCA1 = \frac{foreign\ sources - subsidy\ advances}{total\ assets} \tag{2}$$

Indicators may take values 0 or higher:
- $0.1 \geq$ CZCA (CZCA1) > 0 - low share of foreign resources in the total assets of the municipality where the risk from both long-term and short-term financial stability is minimal
- $0.25 \geq$ CZCA (CZCA1) > 0.1 - a significant share of foreign resources in the total assets of the municipality, and it should be careful when increasing its indebtedness
- CZCA (CZCA1) > 0.25 - a high share of foreign resources in the total assets of the municipality, which may pose a high risk for both short-term and long-term financial stability (assuming there are no savings from previous years, the municipality should not use other short-term or long-term loan funds). (OPF, 2018)

The calculations of individual indicators were used, and the formula of the traffic light method for analyzing the coverage of obligations of municipalities of the Moravian-Silesian region, respectively the possible risks, was used - green colour indicates positive results (low risk), yellow satisfactory (possible risks) and the red colour reflects a high risk of financial instability. Because of the limited number of pages, there is only one example - see Figure 3.

Zátor	0.046	0.057	0.032	0.075	0.041	0.037
Baška	0.041	**0.143**	**0.336**	**0.396**	**0.398**	**0.404**
Brušperk	**0.103**	**0.131**	**0.109**	**0.101**	**0.271**	**0.131**
Bruzovice	**0.181**	**0.338**	**0.184**	**0.252**	**0.216**	**0.203**
Bystřice	**0.137**	**0.104**	0.081	0.034	0.015	0.010
Obec Čeladná	**0.295**	**0.297**	**0.268**	**0.267**	**0.258**	**0.242**
Obec Dobrá	0.039	0.090	0.032	0.070	0.082	0.077

Note: light grey=green, grey=yellow, dark grey=red
Fig. 3. The example of municipality risk levels in the Moravian-Silesian Region in 2010-2016 (Source: authors own according to MFČR, 2018)

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5   Empirical results

The ability of municipalities to cover their assets with foreign sources, both with and without subsidy advances, was analysed in all three hundred MSK municipalities and the resulting values were coloured and summarized in tables. Green boxes represent places where the rate of foreign assets does not pose a threat to the financial stability of the municipality unless they will be indebted. The yellow colour indicates that the asset protection does not pose a significant risk to the long-term financial stability of the municipality, yet no further debt is recommended. The red boxes represent a risk of debt and financial instability for the municipality, not even a short-term indebtedness is recommended and the investment for the next period should be planned prudently.

With regard to the coverage rate of assets with subsidy advances, the minimum risk for more than a half of the monitored period (green colour with values <0.1) was recorded in 244 municipalities, representing 81.3%. The situation with a value of <0.25, i.e. the municipalities marked with yellow colour (more than four years), was recorded in 47 municipalities, which is 15.7%. A high risk of financial instability, i.e. in the red boxes (>0.25), was shown in only 3 % of 300 municipalities, i.e. 9 municipalities. There are 20 municipalities with permanent problems with asset covering, out of which two municipalities (Nové Lubice and Čeladná) have a high risk for most of the monitored period.

The situation is similar regarding the level of coverage of assets without subsidy advances - 251 municipalities carry a moderate risk, equivalent to 83.7% of municipalities. We recorded a medium risk in 14.3% of municipalities, i.e. 43, and a high risk was reported in 6 municipalities (2 %). Only one municipality without subsidies, Nové Lubice, has permanent problems with asset coverage obligations.

When analysing the development of the situation in the municipalities for both indicators, at the beginning of the monitored period (in 2010) the situation regarding the covering the commitments was critical in 16 municipalities, while in 2016 it was only in seven municipalities (Albrechtičky, Bocanovice, Dívčí hrad, Hněvošice, Ludgeřovice and Petrovice u Karviné), in case of counting the subsidy advances; in case of non-counting, the situation was similar - 17 municipalities in 2010 and in the last monitored year, only two municipalities (Dívčí Hrad and Ludgeřovice). Out of 300 monitored municipalities, 17 municipalities showed signs of deterioration of the CZCA indicator in the last monitored year, out of which 7 municipalities were in a critical situation. On the other hand, 15 municipalities showed an improvement in their ability to cover assets at the same time, out of which three municipalities moved from high risk to minimum risk - Milíkov, Bělá and Klimkovice. In case of the CZCA1 indicator, i.e. an indicator measuring the coverage of assets without subsidy advances, the situation deteriorated in 12 municipalities, yet none showed signs of shift towards the high-risk area (Dívčí Hrad and Ludgeřovice were in a critical situation over a long period). An improvement was noticed in 19 municipalities, out of which three municipalities moved from high risk to moderate risk - Milíkov, Klimkovice and Šenov.

Based on the above-mentioned text, we can state that in case of coverage rates, the municipalities in the Moravian-Silesian Region as a whole do not show a high degree of risk, with more than eighty per cent of them being stable and only a few municipalities that have to focus on the improvement. The decrease in the number of municipalities with indicator values higher than 0.25 is also positive. However, in relation to the previous period, in the last year, there was a deterioration of the situation in 17, respectively 15 municipalities. As the aim of the paper was not to investigate the causes of this deterioration, it is possible that these are temporary and will improve in the next years.

6   Conclusion

As the use of public resources by the municipalities must be effective, it has to be monitored. In this monitoring, an increased attention is paid to two indicators, namely the indicator of the covering of assets by foreign resources and liquidity. The first mentioned indicator evaluates the burden of total

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community assets on external resources and thus indicating whether there is not an excessive debt. The aim of the paper was to determine the state of the burden on the municipalities of the Moravian-Silesian Region, as well as whether the coverage of the obligations posed a problem for municipalities. For this purpose, both the above-mentioned indicator and the modified version were selected, when subsidy advances were deducted. The second indicator was chosen to provide the assumption that subsidy advances can significantly contribute to foreign resources and thus influence the outcome of the municipality indicator and rating. All three hundred municipalities were monitored between 2010 and 2016 on the basis of primary research and the data published by the Ministry of Finance within the SIMU information and monitoring system. To determine whether municipalities have a problem with covering their obligations, a method of the traffic light was used, where green colour meant a low risk of non-covering, a yellow represented a middle risk and red colour a high risk of uncovering commitments and financial instability.

By calculating the share of foreign resources in total assets and according to the values obtained - less than 0.1, less than 0.25 and more than 0.25, the municipalities were municipalities were divided into three groups according to the level of risk and assigned in individual years with the given colours (green, yellow and red). It was found that the municipalities in the region do not have a problem with covering commitments, only 20 municipalities have a long-term problem, which is less than 7% of the municipalities; in case of indicators without subsidy advances, it is only one municipality. Overall, the situation in the coverage area has improved - at the beginning of the monitoring, 16 (or 17) municipalities were in the critical situation, only seven, respectively two municipalities at the end. The economic conditions play an important role, as 2010 was a post-crisis year, while in 2016 the economy was in a state of economic growth at micro, regional and macro level. An important role is also played by a stronger support for the regional policy. As Black says (2017), supporting cities in their ability to repay their commitments is a crucial first step towards easing longer and longer-lasting sustainable investments that will provide services to the people and promote green growth and urban development.

7 Acknowledgement

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MODELING LABOR MARKET IN AGING CHINA: A CGE MODEL WITH FORMAL AND INFORMAL EMPLOYMENT

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Abstract
The aging population poses a significant challenge to continue its rapid economic development in China. The change of demographic structure caused the shortage of labor force, which contributed much in last decades. With pressure of shortage of labor force, China needs to take new labor market policy to mitigate the negative result of aging population and increase its labor force supply. However, the main characteristic of labor market in China is market segmentation. The different segments of labor market have challenge to conducting effective labor market policies. The paper builds a simple Computable General Equilibrium model and extends this CGE model with Chinese labor market feature, which is the raising of informal employment in labour market. The aim of this paper is to expand the theoretical base with CGE model to analyse the macroeconomic consequence caused by labour market policy in China with considering the features of labour market itself. This study points out the evaluation and simulation of labor market policy must consider the informal employment in China to avoid the distortion. It also tries to get new branch of theoretical base for further empirical analysis on this issue.

Keywords
Aging population, CGE, Formal and Informal Employment, Labor market segmentation.

JEL classification
C68, D58, J08, J11, J46

1   Introduction

China has a great challenge of its aging population now. As the most population size country, China has remarkable development of its economy and society in last 40 years. The increasing of social welfare, health condition and longer life expectancy contributes the improvement of live of citizens. Meanwhile, with the low birth rate and low mortality caused by the urbanization, better education and the population control policy started in 1980, the demographic structure of China changed significantly. The proportion of aged population, which age over 65, keeps increasing in last two decades, and proportion of young generation, which age under 15, is decreasing (see Fig. 1). The trend of aging population is stable.
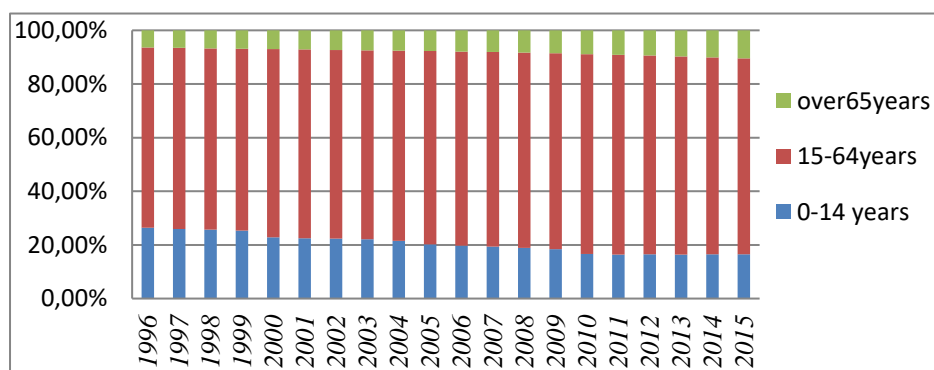

Fig. 1. Demography structure of China from 1996-2015 (Source: UN)

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With predication of UN (2001), the population of China will not increase forever, and population of China will be 1.396 billion in 2026 as its peak and decline to 1.295 billion in 2050. As the same time, the share of population over 65 years of China was 8.92% in 2010, and this number will jump to 16.67% in 2030 (see Fig. 2). That means the rapidly decrease of labor supply in labor market. Undoubtedly, China is moving fast to an aging society and aged society.
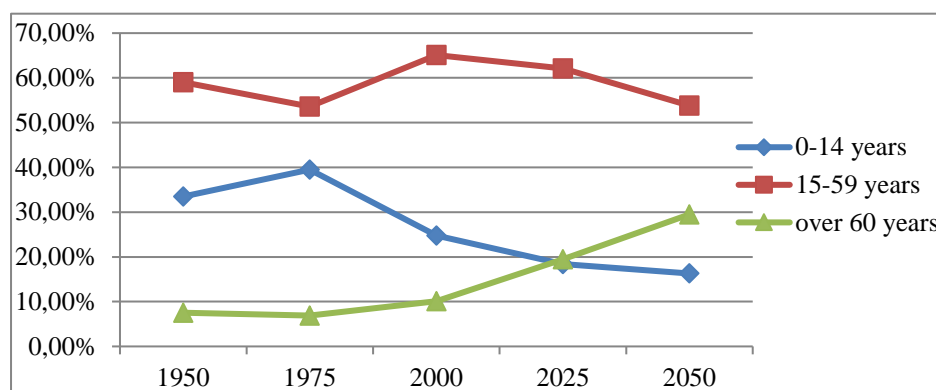

Fig. 2. Estimation of proportion of different population group in China from 1950 to 2050
(Source: UN)

China is not the only country has this problem, the number of "aged society" around world since beginning of last century. The main consequences caused by aging population are lower growth of economic development, declining the saving and personal taxes in economy, and pressure of pension system (Supan 2003). The successful development of China has lots determinants. The most important reason of this dramatic changing is the unlimited labor force supply in last decades. As the most population country in the world, China released huge number labor forces with its politic reform and creation of labor market. Cai and Wang (1999) calculated the relaxion of economic development and labor in China in their research and stated that the one-fourth part of Chinese economic growth contributed by its demographic dividend at last. The shortage of worker or potential labor force would weak the capacity of sustainable development of China. The increase of older dependency ratio, shown as figure 2, causes serious burden to China government and public budget. The deficit of pension system, which was over 4000 billion RMB in 2017, stated by local newspaper.

The change of demographic structure is story of human development. This paper will not discuss the solution from demographic side although it is attracting. The labor market policy could mitigate the negative affect of aging population to the economy, by increasing the productivity or education of labor force (Supan 2003). Basically, the less of labor force means the imbalance of supply from employee and demand from firm. At the microeconomic level, the labor market relates with the contract between employer and employee, which has interactions about hiring, firing, discussing of payment and hours of working. At the macroeconomic level, the function of labor market is to create more job or decrease the unemployment, those also be influenced by immigration, population growth, labor participate rate, social productivity and total income of individuals.

There are vast literature trying to uncover the effect of aging population on labor market with Computable General Equilibrium (CGE) model. The theory of general equilibrium based on the analysis of the structure of sectors and their economic interactions in a country or region to estimate the macroeconomic consequence caused by shock of policy and other outside factors.

Berger (2009) lend a project to study and model labor markets in European Union. In this project, they provided details of modeling the characterization of labor market in EU in theoretical and provided technical description of labor market with CGE model framework, also did a case study of Germany. Other research of modeling the labor market in EU, did by Persyn (2014) and his colleagues, discussed the framework with spatial CGE model which focusing on labor participation of individuals, employment determined by wage and inter regional migration of labor force. They took some

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empirical analysis of their assumption. Boeters (2011) outlined a framework of CGE model of labor market which considering the distinguish of human capital from supply and demand side of labor force. This study did more theoretical analysis on affection of human capital policy, which includes better education and on job training that make difference of skills of labor force.

The Productivity Commission of Australian took the CGE model that developed by Victoria University with some adaption and tested the potential macroeconomic consequences in two minimum wage policy scenarios. This research simulated the changing and trend of aggregate economic output, cost proportion of production, revenues of government and benefit from employment of labor with these different policies.

For most of developed counties, immigration is popular policy with the inflow of labor force from overseas to have younger worker in economy. Fougere (2004) used CGE model with overlapping generations to describe the aging population and immigration in Canada. In this study, the impact of immigration is significant, younger labor force instead of the elder local Canadians, reduces the negative impact of aging problem on economy of Canada in long run. The similar study from Ganesh (2009) with CGE model to analyze the changes of the scale of the immigrant inflow, which are the higher skilled labor force from oversea, and found the increasing immigrants would reduce the cost of goods and improve the competitiveness of products in New Zealand, also bring more revenue to the government, while keep other policy stable.

Lisenkeva (2008) tested the negative impact of aging population on economic performance of Scotland with a multi – period analysis based on demographic structure changing with CGE model. This study indicated that declining of working age labor force depress the economy and more scale of the net migration inflow would migrate this challenge in Scotland.

The labor market in China developed with its reform. The labor market was non-flexible, and regulation was critical, there were rare movement of labor force at the beginning last 80s'. In the following years, the labor market in China has its difference with other countries and the study of this issue shows different consideration. The controlling of labor mobility is a typical character of labor market in China with "*Hukou*" system. The main concept of relates research are taking policy to reduce limitation of labor force mobility from rural to urban area and improve of movement of worker.

Zhai and Hertel (2003) investigated the impact of reform of labor market with losing control of *"Hukou"* policy, which hinder the movement of labor force, and their modeling result shows the rural- urban inequality would less with the reform.

Field and Song (2013) build a theoretical CGE model of labor market in China. They considered the segmentation of labor market, the labor force employed in state-own company, private company and in agriculture sector with the "*Hukou*" registration. They tested the policies which including the promoting of rural development, cost cutting of rural live and the diminishing control of "*Hukou*" system, which cause more migrants inflow to city. They set different scenarios and found that those policies have different results to increasing social welfare without negative affection.

The imbalance of development in different areas is significant in China. The east part of China has more economic advantage and much better development. According to the history data, labor force moved from west part to east part in China in last decades. Jia (2012) compared the impact on economy in different scenarios, including the scenario that no movement of labor in practice, the mobility of labor force of rural area only moves in local region with a CGE model and found the countrywide mobility of labor contributed more to the economy of China.

The citizenization in China means the mobility and movement of rural migrants to city. Wu and Hao (2014) evaluated the policy of citizenization in China with a dynamic CGE model. Their stimulation shows the increasing of labor supply of rural migrants would raise the scale of investment in China and accelerate the structural adjustment of economy.

Cai (2006) introduced the coming of "Lewis Turning Point" in china his research. The opposite trend of demographic change is considered by economist in their study. Study of Peng (2006) stated the effect of aging population to macroeconomic consequences with CGE model. The main results

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of declining labor force are decelerating of domestic investment and decreasing rate of economic growth, and the government should improve the productivity to keep sustainable development.

Peng and Mai (2008) used a dynamic CGE model of China to analyze impact of mobility of labor force from rural to urban area. Government should weaken discrimination or tariff between rural worker who working in city and local urban citizens. They pointed out the shift of labor from agriculture sector to non – agriculture sector improves the output of whole country and the welfare of individuals, which mitigated the adverse side of aging population.

Huang (2013) evaluated the shock of changing demographic structure and set up six scenarios of policy and his results indicated that improvement of labor force skills and human capital investment have more contribution to the economic development of China than the policy of extension of retirement age in long run.

Zhu and Wei (2017) did research of impact of demographic change on economy with a GRACE-CGE model. They introduced the labor supply–effective, which considering the vary labor participate rate and wage payment in different age group of labor force, instead of treating no difference of working population. In their research, they found the positive relation of labor efficiency of age groups and outcome of economy.

Some study discussed the affection from some labor market policy. Peng and Mai (2013) examined the result of retirement age extension. In this dynamic general equilibrium analysis, they set up categories of labor supply, which be divided as urban and rural labor. The policy of raising retirement age increases the supply of labor force and the economy had significant benefit of its economic growth rate, capital stock and domestic consumption.

Jia (2014) build CGE model and examined the effect of policy of minimum wage application in different increasing level to the income distribution in China. They suggested that the increasing of minimum wage should be less than 25%, which would benefit the income distribution, but more than 30% increasing of minimum payment of working negatively affect the employment.

The previous study includes the modeling of labor market with general equilibrium theory and discussion of affection of different labor market policy. The assumption of those research is non-impediment of the application of these policies, which means perfect efficiency of feedback from labor market. The different efficiency of labor market policy caused by the characters of real employment condition in labor market of China is ignored in those studies. The new features of Chinese labor market are remarkable, and some of those features caused the non-efficiency of labor market policy from the central government in China (World Bank, 2006).

The paper aims to use simple CGE model structure to investigate the affection caused by the new feature of Chinese labor market on the potential labor policy of China, which policy are designed to mitigate the negative result of aging population. This paper only supplies the theoretical discussion about labor market feature and policy in a CGE model framework. The empirical study would continue in following works.

The remainder of this paper is organized as follows. Section 2 describes a standard model of CGE. The Section 3 presents the situation of a new feature of Chinese, the formal and informal employment of China. The theoretical analysis of equation or function of those feature of labor market within CGE modal will be stated in this section. Section 4 concludes the paper.

2   CGE model framework

The computable general equilibrium (CGE) model is a popular economic methodology for mathematical analysis of outside shock from public policy and economic change. CGE model describes the internal relations between the sectors and accounts of economic system describe, simulate and calculate the macroeconomic consequence of policy and economic activities.

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2.1 Standard CGE model

According to the "Computable General Equilibrium" developed by International Food and Research Institute in 2002. This paper builds a standard CGE model which consists of three activity*(a)* departments, three commodity*(c)*departments, and one labor force factor*(lab)*, one capital factor*(cap)*. The institutes in this model includes one household*(hh)*, one enterprise*(ent)*, one government*(gov)*, and rest of world*(row)*. And as a simple CGE model, there is only one kind of tax*(vat)* which based on net capital added, taken by government as its income. There is no consideration of transaction cost for all economic behaviors in this model. This CGE model includes three parts with equations to describing the whole economic relations. The first part of functions describes the production, export and import. The second part describes the economic behaviors of each institutes in this system. The third part states the equilibrium of commodity market, and the equilibrium of factor market.

2.1.1 Modeling the production, import and export

This study divides all production activities to three main activity (*a*) departments, agriculture, manufactory and service, according to the regulation of National Bureau of Statistics of P.R.C(2007). Each industry produces only one commodity (*c*) and one commodity (*c*) only can be produced by one activity (*a*). There are three kinds of commodities*(c)*, agriculture product, manufactory product and service product. With the assumption that producer is seeking maximum profit with the constraint of productive technology, the producers have the combination of inputs in production process and changing of the relative price of input factors.

Following (see Fig.3) shows the structure of the production process. At the top level of production process, a Leontief function describes the relation of the total value-added inputs and aggregate intermediate inputs in production. The second Leontief function is used for calculating aggregate intermediate inputs for each activity*(a)*. The input of value added part are labor forces and capital factor, which be described in a Constant Elasticity Substitution (CES) function.
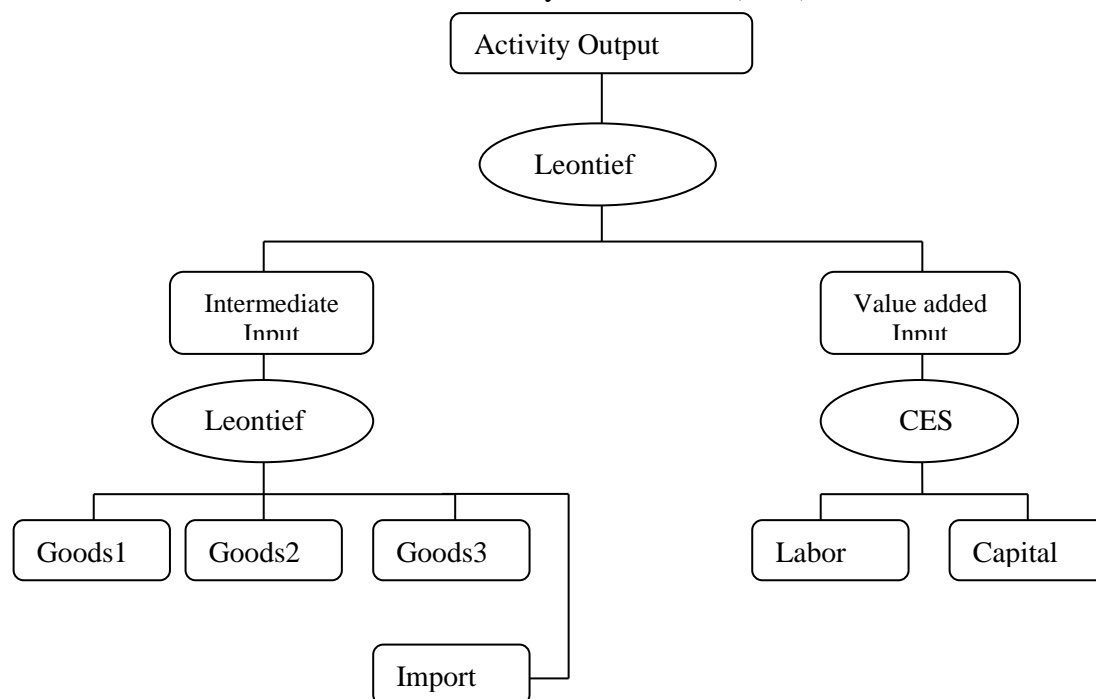

Fig. 3. Structure of production procession in this paper

At the first level, there is a Leontief function, which includes two kinds of input in this process, the aggregate intermediate input and total value-added input:

$$QA_a * iva_a = QVA_a \qquad\qquad a \in A \qquad (1)$$

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$$QA_a * inta_a = QINTA_a \qquad a \in A \qquad (2)$$

Where *A* is sum of activity *(a)*.

At the second level of product process, the production function of total value-added part is described in CES function.

$$QVA_a = \alpha_a^v * \left[\delta_{la}^v QLD_a^{-\rho_a^v} + (1 - \delta_{la}^v) QKD_a^{-\rho_a^v} \right]^{-1/\rho_a^v} \qquad a \in A \qquad (3)$$

With $\qquad \varepsilon_a^v = \frac{1}{1+\rho_a^v}$

To get the maximum profit via the production, the producer produces more balances based on the supply of different factors, labor and capital, with the changing of relative price. The relative prices of labor force and capital factor of optimal input are determined as

$$\frac{wage_l}{wage_k*(1+tvak_a)} = \frac{\delta_{la}^v}{(1-\delta_{la}^v)} \left(\frac{QKD}{QLD} \right)^{(1+\rho_a^v)} \qquad a \in A \qquad (4)$$

At the second level, the production function of the aggregate intermediate input is described in Leontief function, the input in activity*(a)* includes the domestic produced commodity *(c)* and imported commodity *(c)*.

$$QINT_{ca} = QINTA_a * ica_{ca} \qquad a \in A , c \in C \qquad (5)$$

Where *C* is sum of commodity *(c)*.

The domestic producer in activity *(a)* sell their products in both domestic market and oversea market, the relations between the domestic sale part and exported part is described with a Constant Elasticity of Transformation (CET) function.

$$QA_a = \alpha_a^l * \left[\delta_a^l QDA_a^{-\rho_a^l} + (1 - \delta_a^l) QE_a^{-\rho_a^l} \right]^{-1/\rho_a^l} \qquad a \in A \qquad (6)$$

The sale of same product from activity *(a)* in the domestic market and export markets will change for the differential of relative price in these two markets.

$$\frac{PDA_a}{PE_a} = \frac{\delta_a^l}{(1-\delta_a^l)} \left(\frac{QE_a}{QDA_a} \right)^{(1+\rho_a^l)} \qquad a \in A \qquad (7)$$

With $\qquad \varepsilon_a^l = \frac{1}{1+\rho_a^l}$

The total supply of commodity *(c)* includes the output produced by domestic producer and the imported product. The demand of commodity*(c)* includes the demands of government, household, enterprise and the demand as intermediate part in production process. The optimal combination of domestic produced product and demand of import product for lowest cost are determined by a CES functions, also called "Armington function."

$$QC_c = \alpha_c^q * \left[\delta_c^q QDC_c^{-\rho_c^q} + (1 - \delta_c^q) QM_c^{-\rho_c^q} \right]^{-\frac{1}{\rho_c^q}} \qquad c \in C \qquad (8)$$

Changing of the relative price of domestic product and imported product will change the demand.

$$\frac{PDC_c}{PM_c} = \frac{\delta_c^q}{(1-\delta_c^q)}\left(\frac{QM_c}{QDC_c}\right)^{(1+\rho_c^q)} \qquad c \in C \qquad (9)$$

With $\qquad \varepsilon_c^q = \frac{1}{1+\rho_c^q}$

The function (1) to (9) describe the production and marketing of product in the system. The parameter and variable used in functions above are explained in Appendix.

2.1.2 Modeling the economic behaviors of institutions

The institutes in this model includes enterprise, household, government and rest of world. The economic behaviors of institutes include their income, expenditure, saving and investment. Not each institution has all these economic actions. In this paper, the total income of household comes from payment for labor factor, and enterprise has all payment for capital factor inputted in the production.

The income of household comes from their payment as labor supplier. And there is no tax on this factor income.

$$Y_h = wage_l * QLS \qquad (10)$$

The net income after tax payment of enterprise

$$Y_e = wage_k * QDS \qquad (11)$$

The government has its income from tax, and only one tax considered in this model, which calculated based on net capital added in production process.

$$Y_g = \sum_a tvak_a * wage_k * QKD_a \qquad a \in A \qquad (12)$$

With the statement of function (8) and function (9) the income of rest of word is

$$Y_r = \sum_c PM_c * QM_c \qquad c \in C \qquad (13)$$

The distribution of household income consists of two parts, the expenditure or demand on commodity and household saving.

$$E_h + S_h = Y_h \qquad (14)$$

Where $\qquad S_h = r_{hs} * Y_h \qquad (15a)$

The saving rate of household is constant and exogenous ratio

$$S_h = \overline{r_{hs}} * Y_h \qquad (15b)$$

The household, with the constraint of disposable income, consumes products based on maximum their utility. In this study, the function of utility is Cobb-Douglas Function with ratio of elasticity equals to 1. That means the expenditure for household on each commodity(c) has fixed share of total disposal income.

$$E_{hc} = shrh_c(Y_h - S_h) \qquad c \in C \qquad (16a)$$

and $\qquad \sum_c E_{hc} = E_h \qquad c \in C \qquad (16b)$

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The expenditure of enterprise is treated as its investment in standard CGE model. The income after tax of enterprise will be saved and only the enterprise will invest for its inventory and assets. The total value of inventory and assets added equal the total value of saving from household and enterprise.

$$Y_e = S_e \tag{17}$$

$$I_e = S_e + S_h \tag{18}$$

$$I_{ec} = shre_c I_e \qquad c \in C \tag{19a}$$

$$\sum_c I_{ec} = I_e \qquad c \in C \tag{19b}$$

The government has consumptions on commodity *(c)*, with a constant share of each kind of commodity. There is no internal transfer from government to other institutes, and there is no saving of government.

$$E_{gc} = shrg_c * Y_g \tag{20a}$$

$$E_c = \sum_c shrg_c * Y_g \quad c \in C \tag{20b}$$

with $$Y_g = E_g \tag{21}$$

The standard CGE model is a "small open economy" model. With this assumption, there is no limitation of exported and imported product. With the statement of function (6), the expenditure of rest of world is

$$E_r = \sum_a PE_a * QE_a \quad a \in A \tag{22}$$

with $$Y_r = E_r \tag{23}$$

The function (10) to function (23) state the economic behaviors of each institution in this model. The parameter and variables used in functions above are explained in Appendix.

2.1.3 Modeling the commodity markets and factors market

In the commodity market, at the first level of production, total value of output in activity *(a)* equals the total value inputs in this activity.

$$PA_a * QA_a = PVA_a * QVA_a + PINTA_a * QINTA_a \tag{24}$$

The total demand of products produced in activity *(a)* is

$$PA_a * QA_a = QDA_a * PDA_a + QE_a * PE_a \tag{25a}$$

The price of output in activity *(a)* is weighted average of the price of product sold domestically and exported product.

$$PA_a = \frac{QDA_a}{QA_a} * PDC_c + \frac{QE_a}{QA_a} * PE_a \tag{25b}$$

At the second level of production, the total value of value added part shown as

$$PVA_a * QVA_a = (1 + tvak_a)wage_k * QKD_a + wage_l * QLD_a \tag{26}$$

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The value of aggregate intermediate inputs shown as

$$PINTA_a * QINTA_a = \sum_c QINT_{ca} * PC_c \qquad a \in A , \; c \in C \quad \text{(27a)}$$

$$PINTA_a = \sum_c ica_{c,a} * PC_c \qquad a \in A , \; c \in C \quad \text{(27b)}$$

The total supply value of commodity *(c)* is

$$PC_c * QC_c = QDC_c * PDC_c + QM_c * PM_c \qquad \text{(28a)}$$

The price of commodity*(c)* is weighted average of the commodity produced domestically and imported.

$$PC_c = \frac{QDC_c}{QC_c} * PDA_a + \frac{QM_c}{QC_c} * PM_c \qquad \text{(28b)}$$

Since there is no transaction cost in this model and one commodity *(a)* only produced by one activity *(a)*

$$PDC_c = PDA_a \qquad a \in A , \quad c \in C \quad \text{(29)}$$

$$QDC_c = QDA_c \qquad a \in A , \quad c \in C \quad \text{(30)}$$

The total demand value of commodity *(c)* is

$$PC_c * QC_c = \sum_c QINT_{ca} * PDC_c + E_{hc} + E_{gc} + I_{ec} \qquad \text{(31)}$$

In the model, the price of imported commodity*(c)* is exogenous variable.

$$PM_c = \overline{PM_c} \qquad \text{(32)}$$

The total demand of labor factors is equals supply of labor forces, which is exogenous variables this model.

$$\sum_a QLD_a = QLS \qquad \text{(33)}$$

$$\sum_a QKD_a = QKS \qquad \text{(34)}$$

The function (24) to function (34) state the equilibrium of commodity markets and factors market in this model. The parameter and variables used in functions above are explained in Appendix.

2.2 Macroeconomics Closure

The CGE model has different structures, behavioral parameters and closure assumptions relates with vary interpretations of scoters in economy. The results of the modeling of policy scenario are determined by its assumption. In this CGE model, the supply of labor forces and capital are exogenous variables, and each factor always has equilibrium of its total demand and total supply.

$$QLS = \overline{QLS} \qquad \text{(35)}$$

$$QKS = \overline{QKS} \qquad \text{(36)}$$

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The factors have free mobility in the system, the price of factors determined by its demand and supply. According to the "Walras general equilibrium", the price of labor in the baseline will be dominated as numerations (with GAMS): $wage_l = 1$. In addition, QKS, QLS and PM_c are exogenous with original given value.

3   Labor market modules extended

Based on neoclassical theoretical foundation, supplying of labor, as an exogenous variable, which is driven by labor market policy, should affect the other economic variables. The labor market of China shows some new features in recently years, the main feature is the increasing proportion of informal employment in its economy (World Bank 2006, Meng 2017).

3.1   Formal and informal employment in China

World Bank (2006) indicated that the efficiency of labor market policy of central government is reduced since the application of regulation in informal employment sectors is self-controlled mostly by the worker itself. According to the research from Meng (2017), the definition of informal employment includes the workers in private company and self-employment. Figure 3 shows the increasing trend of proportion of labor force who informal employed. The rate of informal employment in labor market of China increased from 16.93% in 2006 to 36.25% in 2015, the number doubled in ten years. Over one-third labor force in labor market are lack of the fully affection of labor market policies with different degree (see Fig. 4).
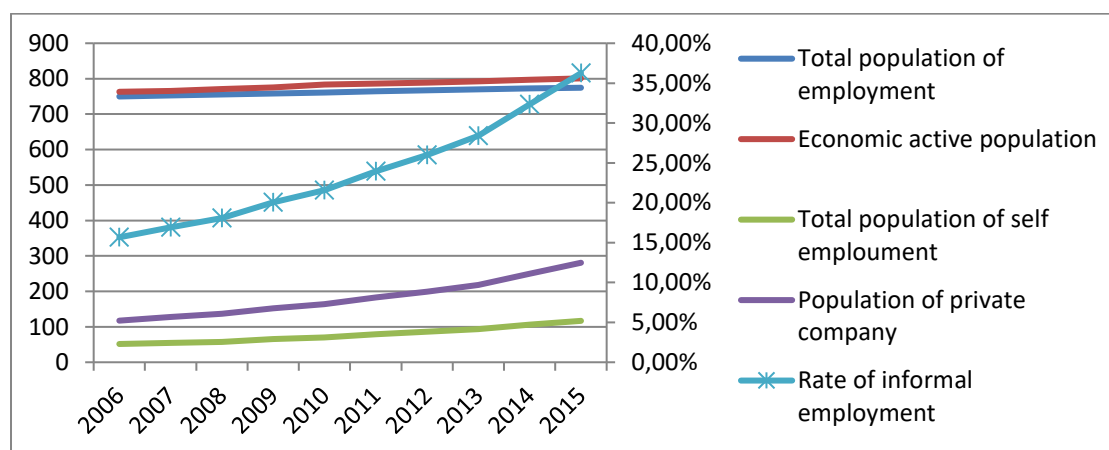
Fig. 4. Ratio of informal employment in China from 2006-2015 (Source: NBSC, 2018)

The supply of labor endowments is exogenous variable in classical CGE model, the amount of labor force determined by factors such as growth rate of population, and labor participation rate which outside the economic system. Increasing of retirement age is alternative option with rapid and direct affection of supply of labor force. The regulation of retirement age of men is 60 years and women is 55 years in China. Some of previous study mentioned in the paper tested economic consequence of raising of retirement age policy in China with the assumption that the policy applied fully in whole labor market and introduced the changing of whole scale of labor forces in their model.

With the characteristic of informal employment existing and increasing in China, it is critical to consider the efficiency of labor market policy. This assumption of paper is the policy of central government cannot get to the informal employment part in labor market or with different degree of its application in different segmentations. Therefore, the labor part in this CGE (see Fig. 5). Here, Labor (ie) is informal employment and Labor (fe) is formal employment.

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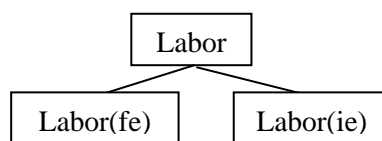of Business Administration in Karvina, 2018

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                    ┌─────────┐
                    │  Labor  │
                    └─────────┘
                   ╱           ╲
          ┌───────────┐   ┌───────────┐
          │ Labor(fe) │   │ Labor(ie) │
          └───────────┘   └───────────┘
```

Fig. 5. Structure of production procession in this paper

3.2 Simple Policy scenario and equation

In the first scenario of application of raising retirement age policy, the whole informal employment has no feedback, that means there is only about 67% of predicted amount changing of labor supply caused by policy compared the total labor force following the regulation. Therefore, the equation (35) changed as

$$\overline{QLS} = \overline{QLS_B} + \Delta\overline{QLS_B} * R_{ie} \tag{37}$$

$\Delta\overline{QLS_B}$ determined as predicted increasing or change caused by the policy of labor force without consideration of informal employment, and R_{ie} is ratio of proportion of informal unemployment of total, as added parameter in this model. More specific, consider the difference of informal employment condition in every production sectors or industries

$$\overline{QLS} = \sum(\overline{QLS_{Ba}} + \Delta\overline{QLS_{Ba}} * R_{iea}) \tag{38}$$

R_{iea} is indicator of share of labor force of informal employment in activity department a. The indicator of informal employment is not stable and keep increasing (see Fig. 4), which means the change of structure of labor market.

3.3 Alternative policy scenario and equation

Considering the segment of formal and informal sector, labor force in this CGE model can be stated as four types based on their employed enterprise's property of ownership sectors. The first part is employment in state own company (including government staffs), incorporate company and FI company, which provide the best protection of labor law in Chinese labor market. The second part is labor employed in collective and limited liability company. The third part is employment in the private business and fourth part is the self-employed or individual business. The equation (35) changed as

$$\overline{QLS} = \sum(\overline{QLS_{Ba}} + \Delta\overline{QLS_{Ba}} * R_{tyna} * D_{tyna}) \tag{39}$$

R_{tyna} is indicator of share of labor force of type n *(1,2,3,4)* employment in activity department a. D_{tyna} is dummy variable which states the efficiency of labor market policy of type n employment in activity department a, which is 1 if fully efficiency of policy and 0 if the policy has no affective in that department.

4 Conclusion

One important feature of labor market in China is segmentation based on the formal employment and informal employment. Those different components of labor force show various feedback to the policy from government. The studies that modeling the labor market, which ignored the real performance of labor market with the assumption that policy have extremely efficient would lead distortions. This paper points out that the outcomes of policy shock to macroeconomic variables

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determined not only by the exogenous factors, but also affected by the characters of labor market in China. The ratio of informal employment shows significant impact on results of simulation through the model.

This research builds an expanded CGE model with the consideration of segmentation of labor market in China. It states the gap between the theoretical increasing of labor force supply caused by labor market policy such as raising retirement age policy and the realistic result of those policies in China.

To mitigate the negative impact of aging population, China seems that has no too much choice. China is not country which agrees the immigration policy, and the *"Hukou"* policy has been abandoned in most area in recent years. The efficiency of potential policy is dominant factor. However, those potential labor market policies such as policy of minimum wage, personal payment rate of pension and taxes of individuals would have different results since these segmentations of labor market. It is necessary to have precisely simulation of the application of policy.

The suggestions introduced in this work are improvement of efficient policy application in labor market in China. The government should consider and distinguish the segments of labor market, especially the informal employment in China. To encourage and design the system for the third party in labor market to investigate, monitor and feedback the implementation of labor market policy in China is an alternative for the first movement.

The further study of modeling and estimating the consequence of aging population and relates policy could focus on more features of labor market in China, the indicators of features are flexible with the changing of social and economy. Moreover, the designing of structures of product process or sectors in CGE modeling according to the characters and segments of labor market could have more contribution of explicit evaluation of the policy and changing of demography in China.

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Appendix

The Explanation of parameters and variables in production functions

Variable	Economic explanation
QA_a	The output in activity (a)
QVA_a	The value-added input in activity (a)
$QINTA_a$	The aggregate intermediate inputs in activity (a)
$QINT_{ca}$	Intermediate input of commodity (c) in activity (a)
QLD_a	Labor factor input of activity (a)
QKD_a	Capital factor input of activity (a)
QDA_a	Domestic selling of product produced in activity (a)
QE_a	Export of product produced in activity (a)
QC_c	Demand of commodity (c)
QDC_c	Domestic produced commodity (c) consumed in domestic market
QM_c	Imported commodity (c)
$wage_l$	The price of labor
$wage_k$	The price of capital
PDA_a	Price of product produced in activity (a)and domestically sold
PE_a	Price of export product produced in activity (a) (in RMB)
PDC_c	Price of commodity (c) domestic supplied
PM_c	Price of imported commodity (c) (in RMB)
QLS	Total supply of labor
QKS	Total supply of capital
Y_h	The total income of household
Y_g	The total income of government
Y_e	The total income of enterprise
Y_r	The total income of rest of world
E_h	The total expenditure of household
E_g	The total expenditure of government
I_e	The total investment of enterprise
E_r	The total expenditure of rest of world
E_{hc}	The expenditure on commodity *(c)* of household
I_{ec}	The investment of commodity *(c)* of enterprise
E_{gc}	The expenditure on commodity *(c)* of government
S_h	The saving of household
S_e	The saving of enterprise
PA_a	The price of product in activity*(a)*
PC_c	The price of commodity*(a)*
$PINTA_a$	The price of aggregate intermediate input
PVA_a	The price of value added input

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Parameter	Economic explanation
iva_a	The share of value added input in Leontief function
$inta_a$	The share of aggregate intermediate inputs in Leontief function
$ica_{c,a}$	The share of intermediate input of commodity (c) in activity (a)
α_a^v	The CES scale factor in production of activity (a)
α_a^l	The CET scale factor of marketing of activity (a)
α_c^q	The CES scale factor of supply of commodity (c)
δ_{la}^v	The share of labor in value added part in activity (a)
δ_a^l	The share of domestic market of product from activity (a)
δ_c^q	The share of domestic supply of commodity (c)
ε_a^v	The elasticity of substitution of labor and capital in activity (a)
ε_a^l	The elasticity of Transformation of domestic sale and export of product produced in activity (a)
ε_c^q	The elasticity of substitution of domestic supply and imported of commodity (c)
$tvak_a$	The tax rate of net capital value added in activity (a).
r_{hs}	The saving rate of households
$shrh_c$	The share of household expenditure on commodity (c)
$shrg_c$	The share of government expenditure on commodity (c)
$shre_c$	The share of enterprise investment of commodity (c)

AN INVESTIGATION OF COINTEGRATION AND CAUSALITY BETWEEN UNEMPLOYMENT, FOREIGN DIRECT INVESTMENT, ECONOMIC GROWTH AND OPENNESS IN ROMANIA

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Abstract

The unemployment rate represents a topic of great concern for the Romanian public as well as the Romanian government. The main objective of this study is to investigate the relationship between unemployment, foreign direct investment, economic growth and openness in Romania using quarterly deseasonalized data in log during 2000-2017. Using the Johansen Cointegration test, we identified one cointegrating equation for the model with deterministic trend in data. Therefore, in order to estimate the long run relationship between the variables, we used a VECM model. The FDI, GDP and the openness have a negative effect on unemployment. In what regards the unemployment rate, we found a unidirectional causal relationship only from GDP towards unemployment rate and from openness towards the unemployment rate. No bidirectional relationship has been identified between the selected variables in Romania. The impulse response functions show that a shock in the GDP produces a positive effect on the unemployment rate during the first 2 years and a negative one from year 3 to 10. In what concerns the other two variables, a shock in the FDI respectively in the openness, produces a negative effect on the unemployment rate for all 10 years in Romania.

Keywords

Foreign Direct Investment, GDP, Openness, Unemployment, VECM.

JEL classification

E22, E24, F43, C3

1   Introduction

Foreign direct investment has become one of the most important sources of foreign financing for all countries and represents an important factor for the economic development. This paper aims to analyze the impact of foreign direct investment and particularly of the economic growth, on the Romanian labour market. According to the official statistics, the unemployment rate in Romania averaged 6.9 percent from 2000 until 2017. Therefore, the unemployment rate is a subject of great public as well as governmental concern.

Before analyzing the relationship between foreign direct investment, economic growth and unemployment we have provided a general overview of the literature that is closely related to the subject. The next section presents the methodology employed, while the third focuses on the empirical results of the paper and is followed by the final conclusions.

2   Literature review

During the last decade, a significant number of studies have analyzed the influence of foreign direct investment and economic growth on labour market conditions. These studies were both theoretical and empirical, and the results differ from one country to another. Theoretical models and empirical analyzes for different countries or periods of time have often revealed different outcomes. These differences may indicate that the effects of foreign direct investment on the labour market may

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change from one country to another, depending both on the country's characteristics and the specific forms of investment.

Barros and Cabral (2000) investigated whether there is a competition among the countries for attracting foreign direct investment. Their results suggest that a large country is more likely to attract foreign direct investment and also has a higher unemployment rate. Brady and Wallace (2000) have also determined the impact of inward foreign direct investment on labour income in the forty-eight contiguous American states during 1978-1996. Their findings are consistent with the theory of spatialization that suggests that inward foreign direct investment has a negative effect on labour income in U.S. for the considered period of time.

In order to find the correlation between foreign direct investment, economic growth and total fixed investment on unemployment in Turkey, Aktar, Ozturk and Demirci (2008), employed the Johansen cointegration test to calculate long-term relationship between the selected variables during 1987 to 2007. Results showed that there are two cointegration vectors in the system, which indicates the long run relationship between variables. In another study of Aktar and Ozturk (2009), a VAR methodology was used in order to determine various correlations between foreign direct investment, exports, unemployment and gross domestic product during 2000:1 – 2007:4 in Turkey. Their research showed that the foreign direct investment did not contribute to the reduction of unemployment rate and changes in gross domestic product did not reduce the unemployment rate during the selected period of time. However, depending on the econometric technique and the data used, the results may change. Thus, the results of Hisarciklilar et al. (2013) regarding the impact of foreign direct investment on reduction of the unemployment rate in Turkey during the same period of time - 2000 to 2007, contradict the results of Aktar and Ozturk (2009). By using a panel data analysis their results indicate that there is a negative relationship between foreign direct investment inflows and unemployment rate. Also Bayar (2014) demonstrated a negative relationship between unemployment and economic growth, respectively export, while between unemployment and foreign direct investment inflows he revealed a positive relationship.

A study carried out by Balcerzak and Zurek (2011) examine the impact of foreign direct investment on the unemployment rate in Poland during1995-2009, using the VAR technique. The authors proved the existence of interdependencies between FDI and unemployment rate, and the impulse response function shows that the foreign direct investment generates a decrease of unemployment rate in Poland, but only in the short-run. Stamatiou and Dritsakis (2014) investigate the relationship between foreign direct investment, growth and unemployment in Greece using data from 1970 to 2012. They used the ARDL approach and the ECM-ARDL model to determine the causal relationship between the selected variables. The analysis shows that an increase of foreign direct investment generates an increase of growth and a decrease of the unemployment, both in the short run and in the long run.

Ciftcioglu, Fethi and Begovic (2007) used a panel data analysis to determine the effect of net foreign direct investment on the growth rate of gross domestic product (GDP), unemployment rate, openness, sectorial composition of GDP and employment in nine countries during 1995 - 2003. By employing a fixed effect model and the Pooled Classical Regression they found that economic growth and unemployment rate is inverse correlated with the growth of the ratio of the net foreign direct investment in the GDP; data also revealed a positive correlation between the openness, the net foreign direct investment and the GDP. Jude and Silaghi Pop (2015) examined the impact of foreign direct investment on aggregate employment in 20 Central and Eastern European Countries during 1995-2012, using panel data techniques. They investigated the effect of foreign direct investment on employment growth in host countries. Moreover, they analyzed the potential factors that determine the relationship between the employment and foreign direct investment.

Nucu (2011) shows the implication of the international financial crisis of 2007 on foreign direct investment in Central and Eastern European countries. She estimated a simple linear regression model in order to determine the impact of foreign direct investment on GDP and unemployment

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rate in Romania during 1991-2009. The results revealed a direct correlation between foreign direct investment and GDP and an inverse correlation between foreign direct investment and unemployment rate.

Kragulj and Parezanin (2015) estimated a linear correlation model between the foreign direct investments and GDP per capita, export, import and unemployment rate in the South and Eastern European countries. They analyzed separately the period before and after the economic crisis. During the pre-crisis period, the results show a significant correlation between foreign direct investment and other macroeconomic indicators, while after the economic crisis the correlation has been extremely weak. The influence of the foreign direct investment on the selected macroeconomics indicators differ from country to country. In what concerns the effect of foreign direct investment on unemployment rate in the South and Eastern European countries, the only countries that revealed a significant negative correlation were Romania and Bulgaria. Simionescu (2017) used a Bayesian approach in order to select some relevant macroeconomic determinants for foreign direct investment in Bulgaria and Romania after the economic crisis. The results show that for both countries foreign investors were attracted by the increase in GDP. In Romania, during the crisis period, the foreign investors were searching for cheap labour force, so the increase in the unemployment rate attracted significant foreign direct investments.

3   Data and methodology

The aim of this study is to investigate the causality between the foreign direct investment (LFDI), unemployment rate (LUR), Gross Domestic Product (GDP) and the openness (LOPE) from Romania. We used quarterly deseasonalized data in log for 2000:01 – 2017:04, collected from Eurostat.

In order to estimate the long run relationship between the selected variables, we will use a VECM model (vector error correction model). First, we investigated the stationarity of data, in order to establish whether a VAR (used for stationary data) or a VECM (used for nonstationary data) is most appropriate. After identifying the adequate model, we have studied the cointegration between the selected variables as well as the Granger causality. We used also the impulse response function in order to study the impact of shocks on endogenous variable and the accumulated impulse responses of the endogenous variables to Cholesky one standard deviation exogenous variable innovation.

4   Model and results

In order to study the stationarity of the data, we used the Augmented Dickey Fuller test, including in the test equation a linear trend and a constant. According to Canova (1994), the choice of the optimum lag length using Akaike Info Criterion has been proven to be inconsistent for more than 20 observations. Because our sample has more than 20 observations (68 quarters), we used Schwartz's Info Criterion.

Table 1. ADF test for selected variables in level and first difference

Log values	ADF (level)		ADF (1st diff)	
	t-statistic	Prob.	t-statistic	Prob.
LUR	-1.933463	0.6265	-6.677446	0.0000
LGDP	-0.993396	0.9380	-7.202320	0.0000
LFDI	-2.268562	0.4449	-10.61437	0.0000
LOPE	-2.551456	0.3034	-9.412381	0.0000

Notes: the optimum lag length selected based on Schwarz info Criterion is 4 for all the variables.
Source: authors' estimates using Eviews 9

As seen in Table 1, all variables are integrated of order 1 - I(1) - for a 5% level of confidence. Using the Johansen Cointegration Test (Johansen and Juselius, 1990) we investigated the existence

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of a cointegration relationship between the variables. The Unrestricted Cointegration Rank Test (Trace) as well as The Unrestricted Cointegration Rank Test (Maximum Eigenvalue) indicated one cointegrating equation for a 0.05 level of confidence, for the model with deterministic trend in data. Therefore, a VECM model with one cointegrating equation was estimated. In order to analyze the causality between the selected variables, Granger causality/block exogeneity Wald test was employed. We have also tested the weak exogeneity in error correction models (ECMs) through Wald tests.

The results showed that the variables with significant impact on the unemployment rate were the foreign direct investments and the openness for 5% level of confidence, as well as the GDP for 10% level of confidence.

The long-run equilibrium equation can be written as follows:

$$LUR = -0.758137 \cdot LGDP - 7.270054 \cdot LOPE - 1.884132 \cdot LFDI + 43.22 \tag{1}$$

The foreign direct investment, GDP and the openness have a negative effect on the unemployment rate. The openness of the economy has the highest impact on the unemployment rate seems, followed by foreign direct investment and the GDP. A 10% increase in GDP (in log) determines a decrease of 7.5% of the unemployment rate in log, while a 1% increase in trade openness determines a decrease of 7.27% of unemployment rate in log.
The estimated VECM model is:

$$\Delta LUR = -0.008 \cdot (LUR_{t-1} + 0.758137 \cdot LGDP_{t-1} + 7.270054 \cdot LOPE_{t-1} + 1.884132 \cdot LFDI_{t-1} - 43.22) +$$
$$+ 0.15 \cdot \Delta LUR_{t-1} - 0.007 \cdot \Delta LGDP_{t-1} - 0.006 \cdot \Delta LFDI_{t-1} - 0.208 \cdot \Delta LOPE_{t-1} \tag{2}$$

where -0.008 represents the speed of adjustment of the unemployment rate in first model. Therefore, the VECM model represents a suitable instrument for revealing the long-run relationship between the selected variables. Further we will test the causality in the Granger sense between unemployment rate, foreign direct investment, GDP and openness. Since we used quarterly data, we choose a model with four lags. The Pairwise Granger Causality Test indicated a unidirectional causal relationship from GDP towards the unemployment rate (for a 5% level of significance), from openness to unemployment rate (for a 10% level of significance), from openness to GDP (for a 5% level of significance), from GDP to foreign direct investment (for a 5% level of significance) and from foreign direct investment to openness (for 5% level of significance). No bidirectional relationship has been identified between the selected variables in Romania.
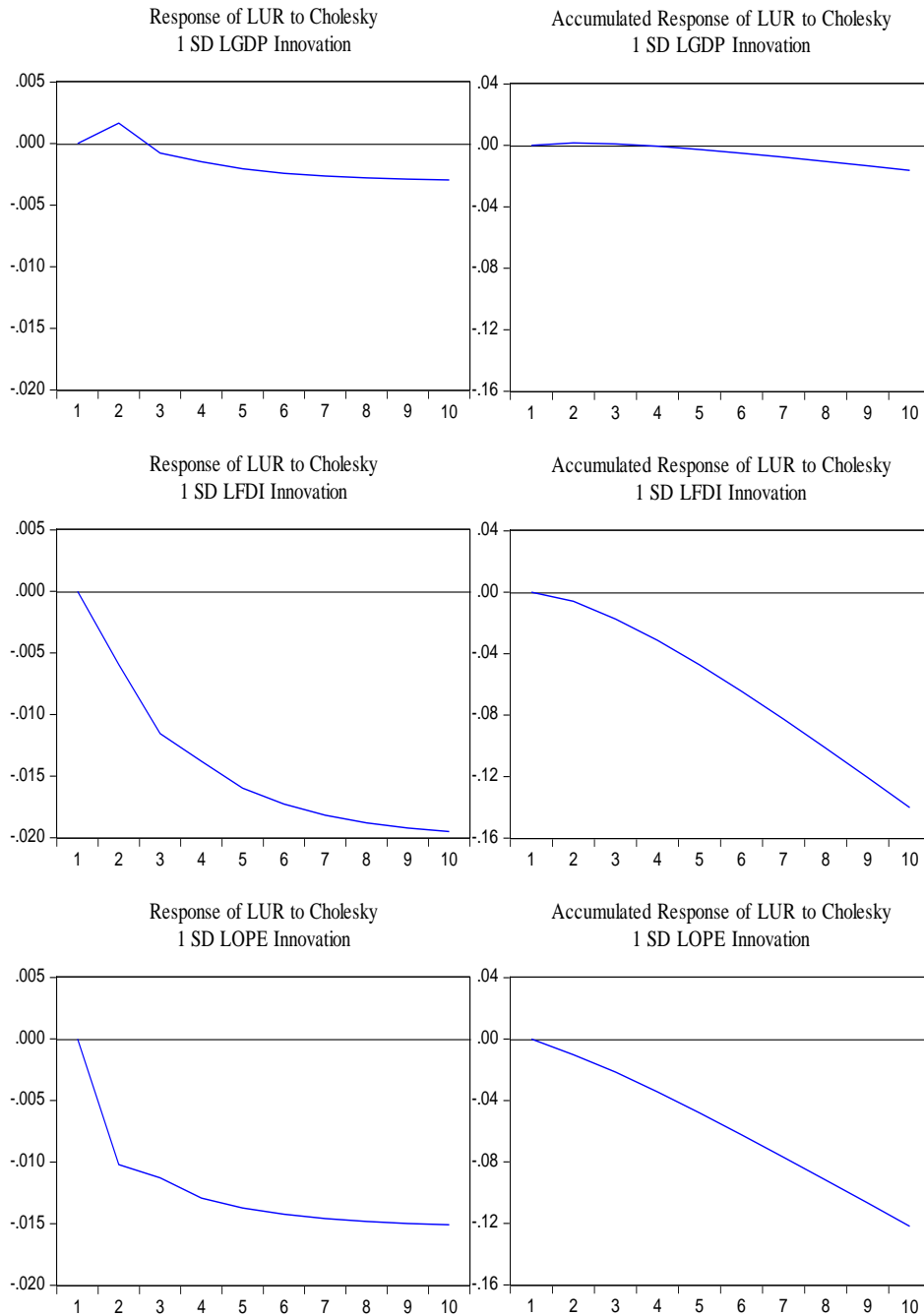
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Fig 1. Impulse response functions of LUR to LGDP, LFDI and LOPE (Source: authors' calculus)

Figure 1 presents the impulse response functions that reveals the impact of a shock in the LGDP, LFDI and LOPE on LUR over a period of 10 years. A shock in GDP produces a positive effect for the first 2 years, but then the effect starts to decrease. In what regards the other two variables, foreign direct investment and openness, Figure 1 shows a negative effect on LUR for all 10 years. The accumulated response shows that a shock in the GDP produces a slight positive response for the first 4 years and followed by a negative reaction on the LUR. A shock in the FDI, respectively in the OPE, generates a negative reaction on the LUR for all 10 years.

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5   Conclusions

The impact of globalization on the labour market and the mechanisms through which growth can generate new jobs are very important for guiding macroeconomic policies. In the context of governments trying to identify solutions to reduce unemployment and increase economic growth rates, foreign direct investment can be considered an important recovery factor from the economic crisis that most European countries are still facing.

In this paper we investigated the causality between the foreign direct investment (LFDI), unemployment rate (LUR), Gross Domestic Product (GDP) and the openness (LOPE) of Romania during 2000-2017. We found that the variables with significant impact on the Romanian unemployment rate are the foreign direct investments and the openness for a 5% level of confidence, and GDP for a 10% level of confidence. The results show that a 10% increase in foreign direct investment (in log) determines a decrease of 1.8% of unemployment rate in log. The Granger test revealed a unidirectional causal relationship from GDP to unemployment rate, from openness to unemployment rate and GDP, fro, GDP to foreign direct investment and from foreign direct investment towards openness. No bidirectional relationship has been identified between the selected variables in Romania.

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DETERMINANTS OF EXPORT AND IMPORT FUNCTIONS IN THE EU MEMBER COUNTRIES

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Abstract
Deepening in asynchronous current account imbalances in the European Union member countries has been examined in the recent empirical literature since the Euro Area establishment. Comprehensive investigation of the main current account determinants is therefore crucial for understanding the key drivers of increasing external imbalances on the common market. This idea is even more challenging considering particular contribution of a single currency to the competitiveness issues in the Euro Area that may result in the proposition of a two speed currency area in the near future. In the paper we have estimated the main determinants of disaggregated export and import demand functions in the European Union member countries. Our analysis based on the panel data was conducted on the sample of 21 European Union member countries. Our results indicate relatively a significant importance of intermediates in the external trade within as well as outside European Union from both territorial and commodity aspects.

1   Introduction

Increasing current account imbalances in the Euro Area (Pisani-Ferry, 2012) represent one of the key design failures that emerged since its establishment (De Grauwe, 2013) and significantly contributed to the emergence of the European debt crisis (Mirdala and Ruščáková, 2015). Moreover, the deepening of external imbalances was associated, according to some authors, with cross-border expenditure shifting process driven by real exchange rates adjustments in member countries (Belke and Dreger, 2011). However, many authors promoted demand drivers (Gaulier and Vicard, 2012) that fueled asynchronous current account imbalances in the Euro Area considering price and cost related determinants as less important. As a result, examination of the most crucial causes of excessive current account imbalances in the Euro Area and possible solutions that would contribute to their reduction still represents challenging topic.

Main objective of the paper is to examine effects of price and non-price determinants of exports and imports in 21 EU member countries. The main motivation that is behind this idea is to (a) identify the key drivers of export and import path (relative importance price/cost and demand drivers will be examined); b) reveal mutual relationship between exports and imports (considering that international fragmentation of production chains makes exports and imports mutually dependent and thus affects their long-term convergent/divergent movement); c) examine effects of the crisis period on estimated results. To meet above mentioned objectives we estimate disaggregated export and import functions that are based on Autoregressive Distributed Lag (ARDL) dynamic model.

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2   Literature review

While empirical literature provides rich evidence of studies examining determinants of export (e.g., Ca' Zorzi and Schnatz, 2007; European Commission, 2010; Bayoumi, Harmsen and Turunen, 2011) and import (e.g., Barrell and Dées, 2005; Stirböck, 2006), increased attention of authors to estimate import functions can be seen in the literature only in recent years (e.g., Kostoska and Petreski, 2009; Bussière et al., 2013). However, only a few studies examined both functions simultaneously to deal with possible causes of converging and diverging trends in the external balance in terms of revealed interactions between imports and exports (e.g., Hooper, Johnson and Marquez, 2000; Allard et al., 2005).

Most empirical studies focus on estimating export and import demand functions, while supply relationships are analyzed under the assumption of infinite price elasticity. Infinite price elasticity is legitimate in the case of an import supply, though considering the small open economy, it is hard to believe that infinite price elasticity also applies to the export supply. Especially, considering the increase in world demand for the goods of a small open economy, this economy is unlikely to be able to meet this demand without changing export prices (unless there are large supplies of inexhaustible resources) (Goldstein and Khan, 1985). However, an important condition of this assumption is that it allows the estimation of export and import functions by methods of a single equation in which price variables are exogenous (Mervar, 1994).

Considering disaggregated analysis, our paper focuses on patterns of final production and trade in intermediate products. Intermediate goods may be used as inputs to the manufactory production for final consumers. The paper points to the significant trend related to the GVCs as the fragmentation of production obviously causes multiple exports and imports of individual components and semi-finished products till the final product is produced and traded on the markets of the final production (Fukumoto, 2012; Jlassi, 2015).

Overview of Empirical Studies of Aggregate and Disaggregated Foreign Trade Analysis and BEC Classification is made in the Table 1.

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Table 1. Overview of Empirical Studies of Aggregate and Disaggregated Foreign Trade Analysis and BEC Classification

#	Author(s)	Publication	Scope of analysis
1	Belessiotis and Carone (1997)	„A Dynamic Analysis of France´s External Trade"	Analysis of the determinants of the export and import of goods and their role in the surplus of France in the 90s.
2	Hooper, Johnson and Marquez (2000)	„Trade Elasticities for the G-7 Countries"	Estimation of short-term and long-term import and export coefficients for G7 countries.
3	Lemoine and Ünal-Kesenci (2003)	„International Trade and Technology Transfer: the Cases of Turkey, India and China Compared"	Examining industry specialization of India, China and Turkey based on different production stages and technology levels.
4	Allard et al. (2005)	„Explaining Differences in External Sector Performance Among Large Euro Area Countries"	Analysis of the traditional determinants of export and import of four largest EU economies, namely Germany, Italy, France and Spain.
5	Gaulier, Lemoine and Ünal-Kesenci (2007)	„China's Emergence and the Reorganization of Trade Flows in Asia"	Examining the impact of China's rise as a global manufacturing base to other Asian economies.
6	Fontagné , Gaulier and Zignago (2007)	„Specialization across Varieties within Products and North-South Competition"	Analysis of the similarity of the export structure and the transformation process among countries.
7	Miroudot, Lanz and Ragoussis (2009)	„Trade in Intermediate Goods and Services"	Analysis of the significance of vertical specialization networks.
8	Gozgor and Oktay (2012)	„Estimation of Disaggregated Import Demand Functions for Turkey"	Estimation of Turkey's disaggregated import demand.
9	Comunale and Hessel (2014)	„Current Account Imbalances in the Euro area: Competitiveness or Financial Cycle?"	Analysis of the determinants of export and import functions together with the trade balance function in Euro Area countries.
10	Giordano and Zollino (2015)	„Exploring Price and Non-Price Determinants of Trade Flows in the Largest Euro-Area Countries"	Analysis of price and non-price determinants of export and import in the countries of Germany, Italy, France and Spain.
11	Ali-Yrkkö, Mattila and Seppälä (2017)	„Estonia in Global Value Chains"	Analysis of Estonian involvement in the global value chains in exploring the commodity and territorial structure of final goods and intermediate products.

Source: Authors' processing

3   Methodology and data

The analysis is carried out on the panel data of 21 EU member states (rest of EU member countries are excluded from analysis due to data inconsistency). Quarterly time series that are employed in the model cover the period 1999Q1-2016Q4 (72 observations) for disaggregated export and import functions estimation. The number of observations is limited due to the availability of data and the need to preserve the integrity of the panel as a balanced model. In both cases, export and import of goods, as components of the trade balance, represent dependent variables. The variables are vis-à-vis the rest of the world and expressed in fixed prices. The data in EUR are drawn from the Eurostat database, and the data in USD are drawn from the International Monetary Fund - Direction of Trade Statistics (IMF DOTS) database. In order to obtain nominal values in EUR, the average exchange rate of the ECU/USD and EUR/USD from the Eurostat database is used (the combination of data in EUR and data in USD should not cause significant differences in results as the evolution of selected

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variables is almost identical in the analyzed countries). We apply the quarterly HICP (2005-100) as a deflator (import and export price indices were not available for more than a half of the analyzed countries in the sample). The data are seasonally adjusted using Census X-13 Arima-SEATS. Seasonally adjusted data are used in logarithm due to the need to reduce the variability of the data. Disaggregated data for the BEC classification are drawn from the Eurostat database in seasonally adjusted form. Consequently, these data are deflated and transformed into the logarithm.

In the previous years, there has been a great interest in dynamic panel models with many cross-sectional units and many observations. However, there are several problems with models using such datasets. According to Pesaran and Smith (1995), Im, Pesaran and Shin (2003) and other authors, one of these problems is, e.g., the inability to assume the homogeneity of the parameters of the slopes. Also, another problem may be the non-stationarity of dynamic panel models. To estimate non-stationary dynamic panels characterized by heterogeneity of parameters within groups, Pesaran, Shin and Smith (1997, 1999) propose two estimation techniques, namely the Mean-group estimator (MG) and the Pooled mean-group estimator (PMG).

The paper regarding the analysis of disaggregated export and import functions is based on the so-called Autoregressive Distributed Lag dynamic model (ARDL) $\left(p, q_1, \ldots, q_k\right)$ which can be expressed as follows:

$$y_{it} = \sum_{j=1}^{p} \lambda_{ij} y_{i,t-j} + \sum_{j=1}^{p} \delta'_{ij} X_{i,t-j} + \mu_i + \check{n}_{it} \tag{1}$$

where $i = 1, \ldots, N$ is the number of cross-section units, $i = 1, \ldots, T$ is the number of observations, X_{it} is $k \times 1$ vector of explanatory variables, δ'_{ij} is $k \times 1$ vector of coefficients, λ_{ij} are scalars and μ_i is an individual effect. The ARDL model assumes a sufficient number of T.

If variables are integrated of order $I(1)$ and cointegrated, then the error term process is $I(0)$ for all i. The basic feature of cointegrated variables is their response to any deviation from long-term equilibrium, what indicates usability of the Error Correction Model (ECM). In this model, the short-term dynamics of the variables in the system are affected by the equilibrium deviation. For this reason, the common practice is to re-parametrize the Equation (3) into the EC equation as follows:

$$\Delta y_{it} = \phi_i \left(y_{i,t-j} - \theta'_i X_{it} \right) + \sum_{j=1}^{p-1} \lambda^*_{ij} \Delta y_{i,t-j} + \sum_{j=1}^{q-1} \delta^{'*}_{ij} \Delta X_{i,t-j} + \mu_i + \check{n}_{it} \tag{2}$$

where the parameter ϕ_i represents an error-correcting speed of adjusted member. If it is true that $\phi_i = 0$, then the long-term relationship is not present. This parameter should be significantly negative on the underlying assumption that variables show the return to long-term equilibrium. The vector θ'_i contains long-term relationships among variables.

Two different real effective exchange rate (REER) indicators are used to measure price competitiveness. REER is calculated against a group of 37 trade partners deflated by the consumer price index (CPI) and unit labor costs (ULC) of the particular country, similarly as in the study of Comunale and Hessel (2014) and Darvas (2012). We have employed two measures of REER because ULC covers only domestically produced goods while CPI includes prices of imported goods as well. Moreover, with the development of GVCs, the share of intermediate goods has significantly increased in the international trade (and hence in external balance). Prices of intermediate production are better covered in ULC than CPI. Similarly, CPI covers non-tradable goods more broadly, whereas ULC tends to reflect mostly tradable goods (Ahn, Mano and Zhou, 2018). We assume that growth in price competitiveness, associated with REER decline, would support export growth. The fall in relative domestic prices due to exchange rate depreciation makes exports cheaper on international markets that is why the export of the country tends to increase.

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4   Empirical results

The results of the Pesaran CD and Breusch-Pagan LM statistics confirm cross-sectional dependencies in all variables in the panel. Therefore, the paper focuses on the CIPS stationarity test that considers cross-sectional dependencies. Also, the IPS stationarity test is used to compare the results when not considering the previous dependence. The results confirm non-stationary data on the levels and stationary data in the first differences. Therefore, the analysis of the paper is based exclusively on the data of the order $I(1)$, or $I(0)$ respectively, so that the presence of undesired $I(2)$ variables is eliminated. The detailed results of the tests are not reported here to save the space. Like any other results, they are available upon request from the author.

The estimation of disaggregated export and import functions is also based on dynamic panel ARDL model for non-stationary heterogeneous panels. Both exports and imports are split into smaller parts from the territorial and commodity point of view. From the territorial point of view, our disaggregated dataset is split into export and import within and outside the EU. The motivation is based on idea to determine which trade flow destination is more relevant to the development of the explanatory variables. At the same time, export and import are divided by the BEC classification into three groups - capital goods, intermediate products and consumption goods.

Table 2 present estimates of the disaggregated export function for the pre-crisis and post-crisis periods that are based on two estimation methods - PMG and MG (to save a space, the results of robustness check based on DOLS and FMOLS estimates of the disaggregated export function for the pre-crisis and post-crisis periods are available upon request from the author).

Table 2 presents the results of the disaggregated export function estimates for both pre-crisis and post-crisis periods. According to the Hausman test, estimates based on PMG model with ULC based REER and the MG model with CPI based REER are selected as the appropriate models for the pre-crisis period while PMG model for both exchange rate variables is more appropriate for a model with post crisis data.

All estimates of import components for a short-term period indicate positive effect on export. However, export in our sample of countries seems to be the most responsive to the shocks in imports of intermediate goods from countries within EU (both pre-crisis and post-crisis periods) indicating effect of international fragmentation of production that makes export and import mutually dependent. Considerable increase in a positive effect on export was identified in case of import of capital goods from countries outside EU in the post-crisis period that corresponds to the rebirth of growth dynamics in our sample of countries fueled by inflows of capital goods from faster growing regions (U.S.A. and China). Responsiveness of export to import of consumption goods from countries within EU in the post-crisis period notably increased as well, however, estimated coefficients are insignificant.

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Table 2. Estimated Results of the Disaggregated Export Function

variable	pre-crisis period				post-crisis period			
	PMG		MG		PMG		MG	
estimated long-term elasticities								
lreer_cpi	-0.348 (0.017)		**-0.199** (0.033)		**-0.328** (0.051)		-0.347 (0.041)	
lreer_ulc		**-0.205**** (0.028)		-0.209 (0.036)		**-0.370*** (0.050)		-0.447 (0.056)
lfd	0.504 (0.021)	**0.506**** (0.057)	**0.298*** (0.089)	0.301 (0.077)	**0.279**** (0.061)	**0242*** (0.072)	0.344 (0.027)	0.217 (0.025)
lm_cap$_{extra}$	-0.093 (0.010)	**-0.112**** (0.018)	**-0.076** (0.008)	-0.019 (0.004)	**-0.615**** (0.048)	**-0.607*** (0.072)	-0.714 (0.043)	-0.631 (0.069)
lm_inter$_{extra}$	0.242 (0.019)	**0.256**** (0.039)	**0.174** (0.037)	0.191 (0.049)	**0.221**** (0.043)	**0.202*** (0.034)	0.395 (0.034)	0.245 (0.043)
lm_con$_{extra}$	-0.255 (0.075)	**-0.298**** (0.080)	**-0.132** (0.037)	-0.144 (0.048)	**-0.069** (0.004)	**-0.033** (0.008)	-0.183 (0.030)	-0.103 (0.047)
lm_cap$_{intra}$	0.355 (0.029)	**0.360**** (0.048)	**0.127*** (0.037)	0.129 (0.042)	**0.105** (0.029)	**0.176*** (0.056)	0.179 (0.042)	0.093 (0.009)
lm_inter$_{intra}$	0.337 (0.071)	**0.319**** (0.013)	**0.494*** (0.039)	0.482 (0.088)	**0.328*** (0.050)	**0.242*** (0.063)	0.287 (0.047)	0.352 (0.045)
lm_con$_{intra}$	0.369 (0.077)	**0.405**** (0.108)	**0.113** (0.068)	0.119 (0.047)	**0.550**** (0.118)	**0.556*** (0.142)	0.665 (0.136)	0.512 (0.134)
estimated short-term elasticities								
ECT	-0.130 (0.045)	**-0.127**** (0.056)	**-0.612*** (0.038)	-0.609 (0.042)	**-0.367**** (0.018)	**-0.385*** (0.028)	-0.827 (0.104)	-0.802 (0.117)
lreer_cpi D1	0.144 (0.029)		**0.150** (0.042)		**0.113*** (0.043)		0.092 (0.011)	
lreer_ulc D1		**0.121** (0.055)		0.110 (0.042)		**0.097*** (0.015)		0.038 (0.006)
lfd D1	-0.111 (0.058)	**-0.050** (0.012)	**-0.135*** (0.047)	-0.116 (0.055)	**0.264** (0.065)	**0.318** (0.063)	0.201 (0.086)	0.033 (0.009)
lm_cap$_{extra}$ D1	0.020 (0.012)	**0.019*** (0.009)	**0.014** (0.009)	0.010 (0.006)	**0.171**** (0.041)	**0.168*** (0.031)	0.053 (0.017)	0.016 (0.007)
lm_inter$_{extra}$ D1	0.095 (0.022)	**0.094**** (0.031)	**0.047*** (0.014)	0.040 (0.018)	**0.003** (0.001)	**0.021** (0.005)	0.075 (0.027)	0.077 (0.039)
lm_con$_{extra}$ D1	0.070 (0.080)	**0.069*** (0.099)	**0.051** (0.249)	0.051 (0.229)	**0.075** (0.317)	**0.093** (0.177)	0.165 (0.060)	0.149 (0.044)
lm_cap$_{intra}$ D1	0.050 (0.012)	**0.049*** (0.009)	**0.030** (0.018)	0.029 (0.013)	**0.066** (0.023)	**0.070** (0.031)	0.056 (0.026)	0.119 (0.029)
lm_inter$_{intra}$ D1	0.380 (0.000)	**0.380**** (0.000)	**0.130*** (0.065)	0.131 (0.039)	**0.199*** (0.066)	**0.240*** (0.020)	0.032 (0.008)	0.028 (0.007)
lm_con$_{intra}$ D1	0.047 (0.009)	**0.040** (0.008)	**0.029** (0.006)	0.017 (0.007)	**0.121** (0.037)	**0.159** (0.029)	0.653 (0.065)	0.641 (0.060)
constant	0.369 (0.066)	**0.262**** (0.088)	**0.343** (0.096)	0.421 (0.148)	**1.575**** (0.229)	**1.272*** (0.307)	1.335 (0.082)	1.181 (0.074)

Note: Standard errors in parentheses. For calculations, 1 lag is considered (suggested by AIC). ECT (error correction term) represents the speed of adjustment. The index D1 indicates the first difference of the variable. The variables are in log form (index "l" before the variable). Lfd is foreign demand, lm is import, lreer_cpi is a REER vis-à-vis 37 partners deflated by CPI, lreer_ulc is a REER vis-à-vis 37 partners deflated by ULC, lm_cap is import of capital goods, lm_inter is import of intermediate goods, lm_con is import of consumption goods. Index extra represents flows from countries outside EU while index intra represents flows from countries within EU. ***, ** and * are the confidence levels of 1%, 5% and 10%.

Source: Authors' calculations.

The results for a long-term period slightly differ in comparison to our short-term estimates. Our estimates indicate a decreased in export after unexpected shock in import of capital (negative response of export to this shock is even higher in the post-crisis period) and consumption goods from countries outside EU. It seems that these types of foreign trade inflows between EU and non-EU countries do not strengthens mutual links between exports and imports in our sample of countries in the long run. On the other hand, import of intermediate goods (from both EU and non-EU countries) positively affects export thought the effect slightly decreased during the crisis period. All three types of imports from EU countries

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have a positive impact on export in the long run. While effects of imported capital and intermediate goods on export slightly decreased due to reduced export performance (lower foreign demand) of countries during the crisis period, effect of imported consumption goods on export raised (shock in this segment of import crowded out domestic production abroad). ECT has an expected negative sign, indicating a return of the variables to the long-term equilibrium (after the initial positive shock).

Table 3 present estimates of the disaggregated import function for the pre-crisis and post-crisis periods that are based on two estimation methods - PMG and MG (to save a space, the results of robustness check based on DOLS and FMOLS estimates of the disaggregated import function for the pre-crisis and post-crisis periods are available upon request from the author).

Table 3. Estimated Results of the Disaggregated Import Function

variable	pre-crisis period				post-crisis period			
	PMG		MG		PMG		MG	
estimated long-term elasticities								
lreer_cpi	-0.102 (0.052)		**-0.183** (**0.052**)		**-0.206** (**0.092**)		0.872 (0.093)	
lreer_ulc		**-0.108** (**0.031**)		-0.222 (0.023)		**-0.267**** (**0.020**)		-0.025 (0.009)
ldd	0.197 (0.055)	**0.231**** (**0.020**)	**0.405** (**0.086**)	0.474 (0.071)	**0.584***** (**0.076**)	**0.742***** (**0.099**)	0.567 (0.089)	0.632 (0.069)
lx_cap_extra	0.061 (0.005)	**0.061***** (**0.017**)	**0.102***** (**0.037**)	0.104 (0.021)	**0.701***** (**0.089**)	**0.682***** (**0101**)	0.548 (0.071)	0.563 (0.088)
lx_inter_extra	0.205 (0.088)	**0.237***** (**0.074**)	**0.183**** (**0.018**)	0.164 (0.051)	**0.568***** (**0.069**)	**0.500***** (**0.063**)	0.502 (0.091)	0.526 (0.102)
lx_con_extra	-0.063 (0.009)	**-0.066***** (**0.008**)	**-0.046** (**0.008**)	-0.038 (0.006)	**-0.153***** (**0.048**)	**-0.139***** (**0.061**)	-0.085 (0.027)	-0.171 (0.106)
lx_cap_intra	0.060 (0.018)	**0.050***** (**0.029**)	**0.060** (**0.015**)	0.089 (0.017)	**0.052** (**0.009**)	**0.040** (**0.017**)	0.111 (0.027)	0.090 (0.024)
lx_inter_intra	0.667 (0.089)	**0.608***** (**0.117**)	**0.361***** (**0.147**)	0.298 (0.065)	**0.286***** (**0.031**)	**0.163**** (**0.030**)	0.391 (0.056)	0.359 (0.090)
lx_con_intra	0.118 (0.032)	**0.139***** (**0.022**)	**0.102** (**0.035**)	0.143 (0.040)	**0.604***** (**0.092**)	**0.630***** (**0.103**)	0.408 (0.031)	0.453 (0.026)
estimated short-term elasticities								
ECT	-0.199 (0.038)	**-0.199***** (**0.041**)	**-0.623** (**0.022**)	0.631 (0.047)	**-0.432***** (**0.063**)	**-0.417***** (**0.067**)	-0.391 (0.088)	-0.384 (0.092)
lreer_CPI D1	-0.214 (0.054)		**-0.132** (**0.041**)		**0.153***** (**0.065**)		0.181 (0.054)	
lreer_ULC D1		**-0.317***** (**0.085**)		-0.327 (0.020)		**0.198***** (**0.074**)		0.207 (0.075)
ldd D1	0.395 (0.104)	**0.405***** (**0.094**)	**0.160** (**0.175**)	0.154 (0.046)	**0.681**** (**0.125**)	**0.627**** (**0.137**)	0.326 (0.051)	0.383 (0.086)
lx_cap_extra D1	0.039 (0.011)	**0.036***** (**0.009**)	**0.010** (**0.004**)	0.011 (0.004)	**0.245***** (**0.069**)	**0.248***** (**0.081**)	-0.035 (0.007)	-0.037 (0.008)
lx_inter_extra D1	0.051 (0.033)	**0.040** (**0.007**)	**0.034** (**0.006**)	0.046 (0.017)	**0.064** (**0.016**)	**0.059** (**0.006**)	0.175 (0.032)	0.187 (0.049)
lx_con_extra D1	0.004 (0.002)	**-0.000** (**0.003**)	**0.001** (**0.002**)	-0.005 (0.003)	**0.020** (**0.007**)	**-0.026** (**0.007**)	0.084 (0.013)	0.146 (0.067)
lx_cap_intra D1	0.026 (0.009)	**0.025** (**0.011**)	**0.000** (**0.004**)	0.009 (0.005)	**0.026** (**0.015**)	**0.020** (**0.007**)	0.011 (0.05)	0.040 (0.006)
lx_inter_intra D1	0.282 (0.1140)	**0.292***** (**0.128**)	**0.188***** (**0.096**)	0.193 (0.087)	**0.178**** (**0.049**)	**0.162*** (**0.084**)	0.193 (0.044)	0.150 (0.081)
lx_con_intra D1	0.051 (0.008)	**0.056** (**0.009**)	**0.036** (**0.009**)	0.031 (0.005)	**0.105** (**0.068**)	**0.057** (**0.026**)	0.079 (0.037)	0.190 (0.086)
constant	-0.924 (0.226)	**-0.951**** (**0.213**)	**-0.946** (**0.301**)	-1.159 (0.197)	**-0.817***** (**0.227**)	**-0.707***** (**0.301**)	-0.884 (0.244)	-0.682 (0.189)

Note: Standard errors in parentheses. For calculations, 1 lag is considered (suggested by AIC). ECT (error correction term) represents the speed of adjustment. The index D1 indicates the first differences of the variable. The variables are in log form (index "l" before the variable). Lfd is foreign demand, lx is export, lreer_cpi is a REER vis-à-vis 37 partners deflated by CPI, lreer_ulc is a REER vis-à-vis 37 partners deflated by ULC, lx_cap is export of capital goods, lx_inter is export of intermediate goods, lx_con is export of consumption goods. Index extra represents flows to countries outside EU while index intra represents flows to countries within EU. ***, ** and * are the confidence levels of 1%, 5% and 10%.

Source: Authors' calculations

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Table 3 presents the results of the estimation of the disaggregated import function in the pre-crisis and post-crisis periods, with the same labels as the export function above. According to the Hausman test, estimates based on PMG model with ULC based REER and the MG model with CPI based REER are selected as the appropriate models for the pre-crisis period while PMG model for both exchange rate variables is more appropriate for a model with post-crisis data.

Short-term estimates indicate generally positive though small effect of export components to both EU and non-EU countries on import. However, export of intermediate goods to EU countries has slightly higher positive effect on import than other components in both pre-crisis and post-crisis periods. Moreover, higher, positive and statistically significant effect was also examined in case of export of capital goods to non-EU countries during the post-crisis period. Similarly to our results for disaggregated export function we suggest that flows of intermediate goods within EU countries is playing an important role (though smaller during the post-crisis period) in strengthening the mutual relationship between dynamics of exports and imports.

Almost all estimated long-term coefficients are significant. Individual export components have positive effect on import except for export of consumption goods to non-EU countries (its negative effect slightly increased during the post-crisis period). Outflows of intermediate production to EU countries represented the most contributive determinant of the import dynamics during the pre-crisis period (its effect during the post-crisis period decreased) highlighting an importance of production chains fragmentation in strengthening mutual links between export and import. Moreover, effect of intermediate production exported to non-EU countries on import significantly increased during the post-crisis period possibly substituting reduced effect of intermediate goods export to EU countries on import. Significant increase in the positive effect on import during the post-crisis period was examined in case of exports of capital goods to non-EU countries (foreign investment demand driver from faster recovered economies outside EU during the post-crisis period) and export of consumption goods to EU countries (foreign consumption demand driver from faster recovered economies within EU during the post-crisis period). ECT has an expected negative sign, indicating a return of the variables to the long-term equilibrium (after the initial positive shock).

5   Conclusion

Examination of the key determinants of export and import dynamics together with identification of the patterns and sources of mutual relationship between export and import in 21 EU countries from aggregate and disaggregated export and import functions revealed interesting implications of deeper economic integration in the EU and international fragmentation of production chains. While our results confirmed relative importance of price (cost) and foreign/domestic demand driven determinants in stimulating export and import, commodity and territorial decomposition of import and export components provide vital information on relative importance of mutual links and relationship between export and import and vice versa.

Our results from aggregate analysis indicate that import represented the most important determinant of export dynamics during both pre-crisis and post-crisis (though with lower intensity) periods. These results are generally conformed to the outcomes of other studies (i.e. Barrell and Dées (2005), Ca'Zorzi and Schnatz (2007), Bayoumi, Harmsen and Turunen (2011)). Disaggregated estimates confirmed clearly higher importance of import links (flows of intermediate goods in the short run (as documented by Fukumoto (2012) in case of China) and flows of capital (as documented by Gozgor and Oktay (2013) in case of Turkey or Jlassi (2015) in case of Tunisia) (its contribution decreased during the post-crisis period), intermediate and consumption (its contribution increased during the post-crisis period) goods in the long run) within EU in determining export performance.

Aggregate analysis of import determinants revealed a dominant role of domestic demand in driving import dynamics leaving export less important (similarly to the results presented by Bussière et al. (2013)) though still contributive factor of import. However, deeper fragmentation of production across countries within EU potentially strengthens long-term links and relationship between imports

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and exports especially due to higher sensitivity to exports and imports of intermediate goods. As a result, this fact will contribute to the reduction of negative external imbalances in countries provided that value added in exports will generally rise. Otherwise, value chains distributed across borders may even deepen negative current imbalances in countries with less sophisticated exports.

Disaggregated analysis confirmed important role of intermediate goods inflows for export performance favoring substantial role of production chains fragmentation across EU (but also non-EU countries especially during the post-crisis period) countries in determining net effect on the trade balance. We suggest that international fragmentation of production may be beneficial (in terms of GDP growth performance) for export oriented countries (smaller and more open EU member countries) while larger EU economies may benefit from higher commodity diversification of their exports.

Strong mutual relationship between export and import (for more evidence in non-EU countries see i.e. Kostoska and Petreski (2009) or Mervar (1994) also indicates a significant role of outflows of consumption (to EU countries) and capital (to non-EU countries) goods in determining import during the post-crisis period.

Relative position of individual country in the process of international fragmentation of production not only affects net gains that result from participation in the process of international division of labor but related mutual links between exports and imports (and associated shares of intermediate goods in the cross-country trade flows) substantially shapes external position (trade balance, current account) of the country. Deeper are the links between exports and imports, the more emphasis should policy makers put on long-term shaping of a structure of domestic internationalized industries to preserve long-term sustainability of a trade balance.

6   Acknowledgement

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PUBLIC SUPPORT TO SMALL AND MEDIUM-SIZED ENTERPRISES IN EUROPEAN UNION THROUGH THE PRISM OF MODERNIZED GENERAL BLOCK EXEMPTION REGULATION

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Abstract
The support for business in the European Union focuses on supporting small and medium-sized enterprises (SMEs), which are considered as an important pillar and stabilization factor of country economy and its regions. While SMEs are important for economic development, they have problems, especially with the access to finance and information. As a result, to address certain market failures, which affect SMEs most significantly, an extraordinary regime was put in place, encouraging EU Member States to provide assistance to SMEs without being in breach of the state aid rules. The favoured status of SMEs is highlighted in the revised General Block Exemption Regulation (GBER). The article focuses on the state aid for SMEs in EU Member States in accordance with EC Regulation no. 651/2014 declaring certain categories of aid compatible with the internal market in application of Art. 107 and 108 of the Treaty. The main objective of the paper is through an analysis of public support for SMEs to characterize and identify its trends through the prism of modernized state aid rules in the European Union with the emphasis on the area of revised GBER. The basic research methods include literature review method, analysis and comparison.

Keywords
European Union, General Block Exemption Regulation, Public Support, Small and Medium-sized Enterprises.

JEL classification
F23, G38, H5, L26, M21

1   Introduction

There are several reasons for public support of small and medium-sized enterprises (SMEs). They are considered to be an important pillar and a stabilizing factor for the economy of the country and its regions (Žebroková and Pellešová, 2014; Havierniková, Okręglicka and Lemańska-Majdzik, 2016; Mynarzová, Štverková and Kaňa, 2017). They are a key source of jobs; create an entrepreneurial spirit and are therefore crucial to boosting competitiveness and employment. They also play an important role in the innovation process and are thus a major element of the knowledge-based economy (Sipa and Skibinski, 2015; Ivanová and Kordoš, 2018). In 2016, SMEs in non-financial businesses in the EU-28 accounted for 99.8% of all non-financial businesses in the EU-28. These SMEs employed 93 million people, accounting for 66.6% of total employment and 56.8% of value added in the EU-28 non-financial sector (European Commission, 2017a). SMEs have been identified as an important factor in the implementation of the European Union's Growth and Jobs Strategy and are key to supporting the Europe 2020 Strategy. Support for SMEs is a central element of EU policies as they have a sense of prosperity for the whole EU economy. While SMEs are important for economic development, they have specific problems. Extensive empirical research and theoretical views of prominent experts show that access to finance and information is one of the dominant barriers to the growth and survival of SMEs (Phedon, 2014; Dziwiński, 2016; Piperopoulos, 2012). As a result, to address certain market failures that affect SMEs most significantly, an extraordinary regime was put in place, encouraging EU Member States to provide assistance to SMEs without being in breach of the state aid rules (Rensmann, 2017). The European Union, its institutions and agencies provide broad support to European SMEs. The favored status of SMEs is highlighted in the revised General Block Exemption Regulation. The main objective of the paper is through an analysis of public support for SMEs to characterize and identify its trends through the prism of modernized state aid rules in the EU with emphasis on the area of revised GBER.

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2   The concept, legislative framework and modernization of the state aid in European Union

In order to minimize disruption to the internal market and consequently to competition, the European Union has been seeking the protection of creative conditions and the reduction of state aid to enterprises from the beginning of the EU integration process in its primary and secondary legislation. However, if there are a real market failure and a policy objective of common interest, state aid may be necessary and justified and the state Aid rules provide a procedural and regulatory framework by which the EU Member States can legally provide state aid. Roots of public support rules are practically unchanged since the signature of the Treaty establishing the European Economic Community in 1957 (Mynarzová and Štverková, 2015). State aid rules are currently set out in Articles 107 to 109 et seq of the Treaty on the Functioning of the European Union (TFEU). The concept of state aid is adapted in Article 107 (1) which states: „Any aid granted by a Member State or through State resources which distorts or threatens to distort competition by favouring certain businesses or production of certain goods shall, if they affect trade between the Member States, be incompatible with the internal market, unless the Treaties provide otherwise". In the case law of the Court of Justice of the EU, it is now clear that the Article 107 (1) sets out four cumulative criteria to determine whether a public measure is a state aid. These criteria are: there must be a transfer of state resources that can be attributed to the state; transfer must provide an advantage; the advantage must be selective; the aid must affect trade between Member States and distort competition. The TFEU declares state aid to be in principle incompatible with the internal market. However, this principle is not absolute. Under certain conditions, state aid may be granted to undertakings. Primary law provides a large area of aid from the scope of Article 107 (1) absolutely or conditionally exempted. The Article 107 (2) TFEU provides for state aid cases, which are automatically exempted from general prohibition. There are three types of state aid: "social" support; aid for the recovery of damage caused by extraordinary events and aid to the economy of certain areas of the Federal Republic of Germany affected by the division. The Article 107 (3) TFEU lists the types of state aid that may be considered as compatible with the internal market: a) aid to promote the economic development of areas with an extremely low standard of living and high unemployment; b) aid to support the implementation of an important project of common European interest or to remedy a serious disturbance in the economy of a Member State; c) aid to facilitate the development of certain economic activities or areas without adversely affecting trading conditions to an extent which would be contrary to the common interest; d) aid to promote culture and heritage conservation, if it does not affect trading conditions and competition in the Union to an extent contrary to the common interest, and other types of aid that may be established by the Council decision by the EC proposal. State aid which is or may be considered compatible with the internal market under these exceptions must be notified in advance to the European Commission (EC). Exceptions in EU legislation can be considered as general exceptions (Article 107 (2) TFEU); individual exceptions (Article 107 (3) TFEU); block exemption (General Block Exemption Regulation no. 651/2014); ad hoc exceptions established by the Council (Article 108 (2), third subparagraph, TFEU).

   Legislation on the provision and control of state aid and its development was not a priority, and the EC's approach to change in secondary treatment was rather a intelligent approach at the beginning of the 1990s (Mynarzová and Kaňa, 2015). Over the last decade, this is an area in which the EU has made significant political progress, responding to it by the new regulations and their ongoing reviews. This has caused a situation where, contrary to the traditionally envisaged concept of state aid bans on the private sector, it was rather appropriate to talk about the legal conditions for granting state aid approval based on their assessment by the European Commission (Janků and Mikušová, 2013). The Commission launched a consultation in 2005 to reform the state aid scheme in the context of the Lisbon Strategy (European Commission, 2005). It reiterated the urgency of this area of law: maintaining a level playing field between businesses. The EC has recognized that state aid may be justified in the event of market failure. State aid in matters such as innovation, research and development and risk capital was therefore considered to be potentially legitimate if the market did

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not provide the necessary incentives to engage in these activities (Craig and Búrca, 2015). This led to a new block exemption. The requirements of the Europe 2020 strategy played an important role in determining the direction of state aid in the EU. In their expectation, the EU Member States had the following priorities: to reduce the aid intensity in relation to GDP, to reduce state aid that can reduce competition, to shift sectoral aid to horizontal and regional aid, and to change forms of state support from passive to active (Stępniak-Kucharska, 2013). On 8 May 2012, the EC presented a communication "State Aid Modernization", in which it announced a comprehensive reform program of the existing instruments on state aid control. The Commission has defined three objectives of the state aid modernization process: to support the growth of a strengthened, dynamic and competitive internal market; concentration of enforcement on cases with a huge impact on the internal market and simplified rules and quicker decisions (European Commission, 2012). Among the key objectives of the reform are tangible cuts in red tape, the promotion of a better use of limited public resources by Member States and of a higher contribution of aid measures to growth. The purpose of innovative state aid legislation should be a rigorous and targeted state aid control that should improve the functioning of the internal market through more effective policies aimed at reducing distortions of competition, maintaining a level playing field for individual players (Mynarzová, Kaňa and Okręglicka, 2016a). Reform of state aid is still ongoing, with further initiatives being planes (European Commission, 2018).

3   The state aid to SMEs by prism of modernized block exemption regulation

A block exemption, part of the state aid reform package, was introduced in 2008 – Commission Regulation (EU) No 800/2008. It was revised in 2014. The Commission adopted one of the key legislative instruments for the provision of state aid, the EU Commission Regulation No 651/2014, which in accordance with Art. 107 and 108 of the TFEU declaring certain categories of aid compatible with the internal market on 21 May 2014. As a result of the reform, a meaningfully larger number of small and unproblematic measures are exempted from prior notification, notably those granting the aid to tackle local needs. Categories of block exemptions applicable in EU Member States are depicted in Table 1.

Table 1. Support categories defined by GBER

Regional aid
Aid for small and medium-sized enterprises
Aid for access to financing for small and medium-sized enterprises
Aid for research, development and innovation
Aid for education (training aid)
Aid for disadvantaged workers and workers with disabilities
Aid for environmental protection
Aid to make good the damage caused by certain natural disasters
Social aid for transport for residents of remote regions
Aid for broadband infrastructure
Aid for culture and heritage conservation (including aid schemes for audio-visual works)
Aid for sport and multifunctional recreational infrastructures
Investment aid for local infrastructure
Aid for regional airports
Aid for maritime and inland ports

Source: Commission Regulation (EU) No 651/2014; Commission Regulation (EU) No 2017/1084.

The scope of the GBER now covers almost all categories of exception in the Art. 107(2) and (3). The Commission included a range of new areas that had to be dealt with in the past through notifications into the modernized system of block exemptions. The most important new category

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includes the aid for culture and heritage conservation, the aid for broadband infrastructure, the aid for sport and multifunctional recreational infrastructures, the aid for the local infrastructure, support innovative clusters and the process or organizational innovation, or the support for the urban development. The Commission in Regulation (EU) No 2017/1084 from May 2017 further widened the scope of the General Block Exemption Regulation. The scope of the GBER was extended to cover two additional economic sectors: ports and airports, there have also been a number of new simplifications in other areas (European Commission, 2017b). The new rules exempt support measures for the ports and airports and give Member States more flexibility to support culture, multifunctional sports arenas and businesses in the EU's outermost regions.

In order to facilitate the development of SMEs' economic activities, the new EU Regulation exempts certain categories of support when provided to SMEs: Aid to SMEs and Aid for access to finance for SMEs. The maximum allowable aid intensity for several types of aid has been raised. Many thresholds for notification of individual amounts of aid have also been raised (Phedon, 2014). Category "Support to SMEs" includes: investment aid (Art. 17 GBER), advisory support (Art. 18 GBER), support for participation in fairs (Art. 19 GBER) and new support costs for co-operation to enterprises participating in European Territorial Cooperation (ETC) projects (Art. 20 GBER). Under these provisions, SMEs can benefit from the public support of up to EUR 7.5 million (see Table 2).

Table 2. Threshold values and the aid intensity of aid categories to SMEs in revised GBER

Category	Threshold (million EUR)	The aid intensity
Aid to SMEs:		
Investment aid	7,5	shall not exceed 20 % of the eligible costs in the case of small firms; max. 10 % in the case of medium-sized firms
Aid for consultancy	2	shall not exceed 50 %
Aid for participation in fairs	2 /year	shall not exceed 50 %
Aid for cooperation costs incurred by SMEs participating in ETC projects	2	shall not exceed 50 %
Aid for access to finance for SMEs:		
Risk finance aid	15	10 % of the risk finance provided to the eligible undertakings prior to their first commercial sale; 40 % referred to in (5b); 60 % of the risk finance for investment provided to eligible undertakings mentioned in (5c) and for follow-on investments in eligible undertakings after the 7-year period mentioned in (5b)
Aid for start-ups	N/A	the amount of aid provided for each undertaking in Art. 22 (3), (4) and (5) GBER
Aid to alternative trading platforms specialized in SMEs	N/A	the amount of aid provided for each undertaking in Art. 22 (3), (4) and (5) GBER where the platform operator is a small enterprise
Aid for scouting costs	N/A	shall not exceed 50 %

Source: Commission Regulation (EU) No 651/2014.

"Aid for access to finance for SMEs" is another important category for small and medium enterprises. The Commission considers that the development of venture capital financing and the improved access of SMEs and small and medium-sized venture capital companies to venture capital financing are, in general, of great importance for the European Union economy. The Commission has

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created a flexible framework for granting the state aid to SMEs at every stage of their development, allowing them to innovate - to launch new products and ideas and create jobs. If the state aid for the provision of venture financing these companies properly targeted, can be an effective means to alleviate the identified market failures and enable private capital. The aid for access to finance for SMEs consists of the risk finance aid (Art. 21 GBER), the aid for start-ups (Art. 22 GBER), the aid for alternative trading platforms specialized in SMEs (Art. 23 GBER), and the aid for scouting costs (Art. 24 GBER). In the case of aid aimed at enabling SMEs to access risk finance, the notification threshold has increased from EUR 1.5 million per year to a total of EUR 15 million over the entire development cycle of the company. The schemes in accordance with the rules laid down in the GBER may be notified to the Commission. This makes it easier to provide delivery of aid and reduce bureaucracy (Mynarzová, Kaňa and Okręglicka, 2016b). There is now a wider range of possible financial instruments that better reflect market practices, but also the stage and sectors in which the company operates. The new rules remove the requirement that the company was 70% financed from its own resources. It is still necessary to involve private investors in order to ensure that the aid alone will attract the new investors than fully replace private funding. The minimum participation of private investors ranges from 10-60% depending on the age and the risk of the company - the old regulation set 50% in non-assisted areas and 30% in assisted areas (Mynarzová and Okręglicka, 2018).

3.1   Methodology and data

The aim of the paper is through an analysis of public support for SMEs to characterize and identify its trend through the prism of modernized state aid rules in the European Union with the emphasis on the area of revised GBER. For the needs of the research, the author used some of the basic methods of the scientific research to obtain information necessary for the complex systemic processing of the issue. The author predominantly used literature review method, the analysis and comparison of the secondary data. The analysis was conducted on the basis of "State Aid Scoreboard" reports published by the European Commission, which represent a clear and comprehensive source of information on state aid granted in the European Union. For purposes of analysis was chosen period 2014-2016, with regard to the process of modernization of state aid, which was launched in 2014. The full impact of the new block exemption regulation, which came into force on 1st July 2014, can be monitored from 2015 onwards. Unfortunately, at the time of paper submission, the data for 2017 were not available.

To address the research objective, the following research hypotheses have been formulated:
H1: Public aid granted under the revised GBER is becoming the dominant legal form of the state aid in the European Union.
H2: The state aid for SMEs including the risk capital under revised GBER provides a broader and more operative support framework in the European Union.

3.2   The empirical characteristic and evaluation of block-exempted aid to SMEs

Member States spent EUR 97.3 billion on state aid at EU level in 2016, i.e. 0.65% of GDP (European Commission, 2017c). Compared to 2013, i.e. before the reform of state aid in the EU, state aid expenditure has increased both in absolute terms (+37 512 million EUR) and in relation to GDP, with an increase of 0.21 percentage point. This development can largely be attributed to the state aid modernization process launched in 2014, including the new form of the block exemption regulation.

More than 97% of the newly implemented measures for which expenditure was reported fall under the GBER in 2016, i.e. an increase of about 25 percentage points compared to 2013. For all measures for which expenditure was reported approx. 80% of all measures were block exempted in 2016, an increase of 20% compared to 2013. As regards expenditure, the total expenditure for measures under the GBER represented 31 billion EUR in 2016, i.e. approximately 32% of total expenditure. Taking account of the simple average of country-specific expenditure amounts within the GBER which reflect uniformly the differences in Member States' practice, it appears that in 2016 Member States

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spent on average around 46% of the total expenditure for measures under the General Regulation GBER, 11p.p. compared to 2013 (see Figure 1).
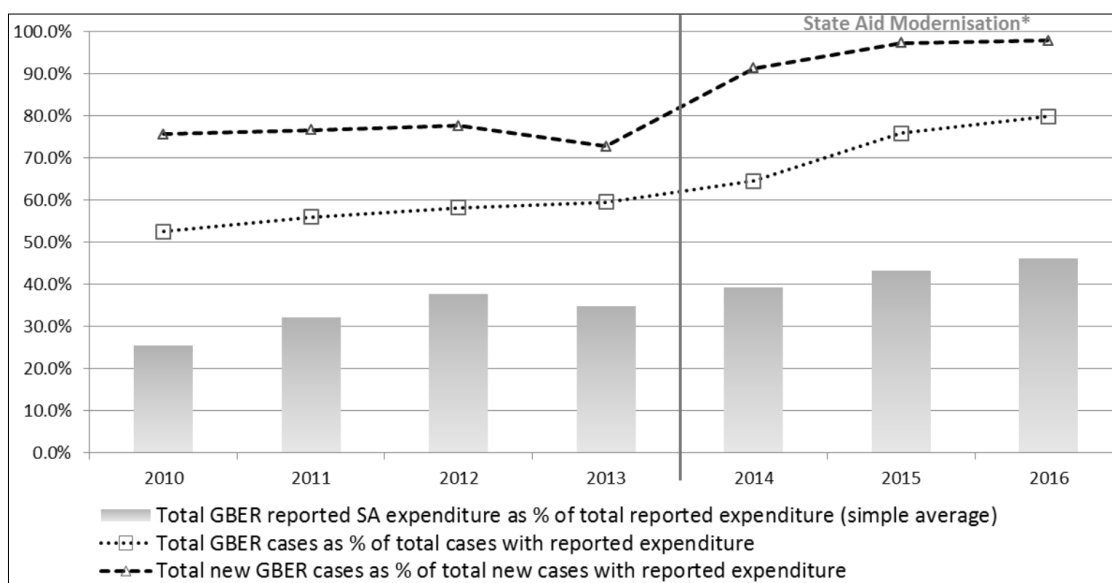

Fig. 1. Use of GBER in the EU in the period 2010-2016 (Source: European Commission, 2017c)

The total volume of expenditure covered by the block exemption recorded a gradual increase over the period considered. Compared to 2013 support provided under the block exemption increased in 2016 by 9 736.6 million euros, which represents an increase of 45.28 in percentage terms (see Table 3). As for the various categories of block exemptions, the most significant changes recorded the following items: increase in state aid for environmental protection including energy savings; increasing state aid for research and development including innovation, increasing aid to SMEs including risk capital, increase in aid for culture and reducing state aid for regional development.

Table 3. Aid awarded under block exemption in the period 2008-2016 (million EUR, current prices)

	2010	2011	2012	2013	2014	2015	2016
Regional development	6 466.1	6 219.3	6 017.0	5 999.1	9 957.0	7 320.0	5 664.9
Research and development including innovation	1 361.0	1 980.7	2 757.8	3 235.0	3 635.9	3 695.1	3 914.3
Environmental protection and energy saving	680.0	5 027.3	7 414.1	8 032.4	7 695.2	10 453.3	12 903.6
SMEs inc. risk capital	2 099.2	1 899.4	1 876.4	1 633.8	1 511.6	2 124.4	2 919.7
Employment	1 377.8	1 327.7	1 467.2	1 636.5	1 657.3	1 614.2	1 435.7
Training	722.4	817.4	1 022.2	747.0	558.2	753.1	475.0
Culture	125.3	1.8	0.1	16.6	429.4	1 698.9	2 673.5
Compensation of damages caused by natural disaster	0.0	0.0	0.0	28.8	110.7	167.2	144.4
Social support to individual consumers	0.0	0.0	0.0	0.0	437.7	430.0	452.4
Total	12 952.4	17 374.3	20 654.0	21 499.1	26 103.8	28 583.7	31 235.7

Source: European Commission, 2017; own processing.

As regards expenditure for SMEs including risk capital grew gradually over the next few years after falling between 2013 and 2014. In 2016, this expenditure amounted to EUR 2 919.7 million. Support for SMEs accounted for approximately 7% of the total GBER spending referred to largely

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under Art. 17 GBER Investment aid to SMEs (62%) and Art. 21 GBER Risk finance aid (26%). The reported expenditure on SME targets more than doubled in 2016 compared to 2014 (see Table 4).

Table 4. Spending for SMEs by provisions of the 2014 GBER (million EUR)

	2014	2015	2016	2014-2016
Aid to SMEs:				
Investment aid to SMEs	457	916	948	2321
Aid for consultancy in favour of SMEs	2	21	65	88
Aid to SMEs for participation in fairs	0	5	37	42
Aid for cooperation costs incurred by SMEs participating in ETC projects	0	0	9	9
Aid for access to finance for SMEs:				
Risk finance aid	24	488	443	955
Aid for start-ups	41	120	157	318

Source: European Commission, 2017c; own processing.

The duration for the assessment of notified measures has remained broadly stable at about 5 months over the period 2013-2016 at EU. However, given the growing share of block exemptions that Member States can make without delay, it can be stated that state aid measures can be implemented on average much faster than in the past. According to European Commission (2017c) calculations, the theoretical average before duration was approximately 3 months in 2013 and approximately 2.5 months in 2016, i.e. a 20% decrease.

4   Conclusion

In the paper selected aspects of public support to SMEs were discussed in the context of the most comprehensive overhaul in the history of state aid system in EU, which started in 2012. Most rules of the State Aid Modernisation process, untried in force on July 1, 2014, allowing the EU Member States faster implementation of public aid that fosters investment, economic growth and job creation, leaving the Commission to focus its state aid control on measures that genuinely affect competition in the internal market. The main objective of the article was, through an analysis of public support for SMEs, to characterize and identify its trends through the prism of modernized state aid rules in the European Union with the emphasis on the area of revised GBER.

The new GBER brought more freedom in granting state aid without prior notification and approval by the Commission and introduced ex post requirements (e.g. evaluation of large aid schemes and transparency on aid measures) to the Member States. SMEs were given greater opportunities in the field of the state aid. The support is available in various forms, such as grants, loans, guarantees either directly or through programs managed at the national or regional level. SMEs can also benefit from measures in the form of different programs and business support provided by the EU Member States. SMEs are eligible for all aid categories allowed under EU state aid rules and for those categories of aid measures that may also be granted to large enterprises. In view of the fact that market failures are greater for small and medium-sized enterprises compared to large enterprises, different aid intensities and different remuneration are set for these categories. The new GBER applies for aid in all economic sectors, except those, explicitly excluded. Now, block exemptions cover a wide array of sectors and aid measures: new categories for exemption; new forms of exempted aid within existing categories and higher notification thresholds and larger aid intensities. Member States can provide these categories of aid without delay and then inform the Commission.

The research hypotheses stated in the article were generally verified. Nowadays, the state aid granted under new GBER is the dominant legal form of the state aid in the EU. Over 97% of new provided aid measures fell under the new GBER and could be quickly implemented by Member States to the benefit of entrepreneurs and regions, decreasing bureaucracy and time delays. The state aid for

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SMEs under new GBER now provides a broader and more operative support framework in EU. The new GBER allows exemption without notification for more types of aid. In relation to SMEs, they can benefit from any category of aid covered by the GBER. The modernized approach allows better allocation of resources and promotes higher efficiency. The purpose of public enterprise support should be to strengthen global and long-term business competitiveness and stimulating entrepreneurial activity. It can be said that, as a result of the modernization process, the new state aid scheme presently meets these criteria. Public support should continue to be primarily based on horizontal support, in particular to support the development of SMEs. The next research will focus on examining the impacts of the modernized state aid rules in the context of Europe 2020 objectives.

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WESTERN BALKANS AHEAD OF THE GATES OF THE EUROPEAN UNION – OPPORTUNITIES AND RISKS

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Abstract

In recent years, enlargement policy has come to the fore with the policy of neighborhood, and both are being developed intensively. The adoption of Croatia five years ago became a hope for other countries in the region. The Bulgarian Presidency of the EU brought new impetus to its immediate and remote neighbors in the Western Balkans[1] for their peaceful future and economic prosperity. The Western Balkans Strategy and the EU-WB Summit confirmed a number of concrete measures to strengthen cooperation on interconnection, security and the rule of law. It is essential steps to maintain peace in Europe by laying the foundations for deeper cooperation on security, migration and tackling geopolitical problems, but also on improving energy and transport infrastructure and digital interconnections. The paper emphasizes the need for a regional economic area that will facilitate trade in the Western Balkans, create impetus for investment inflows and enable the transition to the digital economy. Both the opportunities and the risks associated with the enlargement of the integration process to countries with a significantly lower economic level will be analyzed - the close trade link between these countries to the European Union will bring positive but may have negative impacts.

1   Introduction

If there are many questions about the global influence of the EU, there are fewer about its impact on its immediate neighborhood. The European Neighborhood Policy was launched in 2004, encouraging a relationship that the EU describes as privileged, and with the goals of promoting democracy, human rights, rule of law, good governance, and market economies. McCormick (2017) identifies four distinct rings of influence:

- States that have joined the EU over the last decade and are perceived as an example of the success of enlargement policy.
- States that have short-term potential to either become members of the EU or at least have strong economic links with the EU (Western Balkan candidate states).
- States that have longer-term prospects of joining the EU (Western Balkan potential candidate and associated states of the Eastern Partnership).
- States that are not qualified for membership but cannot escape the gravitational pull of the EU (located geographically out of Europe and also Russia).

In each of these rings the European Union plays an important role in the making of economic policy. The EU has taken a leading role by coordination of economic aid and also signed trade and cooperation agreements and several programs were launched to help economic and social reform. The EU created the European Bank for Reconstruction and Development and also offered loans from the European Investment Bank.

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[1] Today the group comprises Albania and as the result of the political fragmentation of the former Yugoslav space also Bosnia and Herzegovina, Kosovo, Macedonia (officially called FYROM, respectively North Macedonia in future), Montenegro and Serbia (Batt, 2013).

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Beyond the Balkan states, one could also mention non-Balkan states - Moldova, Ukraine and Georgia, which as of 2014 have Association Agreements with the EU and are keen to join. However, the EU has yet to give them the green light by declaring them official candidate countries. The accession of the countries of the Eastern Partnership to the EU or NATO is not yet on the agenda[2] but Ukraine and Georgia are particularly well placed on it. Enlargement of the EU to other states of the former USSR is impossible for Russia's fundamental disagreement, and the Union has not yet considered it. The remaining three countries of the Eastern Partnership (Belarus, Armenia and Azerbaijan) are much more focused on economic and security co-operation with the Russian Federation as mentioned by Fawn (2013).

2   European Union Enlargement and Western Balkans Countries

It has been five years since Croatia, the first Western Balkan country, became a member of the European Union on 1 July 2013. Its admission was also a hope for other states in the region that were struggling to cope with the situation caused by the fratricidal wars accompanying the disintegration of Yugoslavia. After becoming independent, the successor states became the source of extreme tension, which is not fully eliminated even at present. The main motive for activating the EU's interest in its surroundings is to avert political, economic and security threats and create a space of stable political systems around the EU. Another reason is the effort to stabilize the immediate neighborhood of the EU on the bases of European values. Just remember the words of German Chancellor Helmut Kohl that "the policy of European integration (including expansion) is in reality a question of war and peace in the twenty-first century." (Haseler, 2004) However, all the former new countries were stable democracies upon their entry. In the case of the Western Balkan countries, the situation is more difficult. While accession for the whole region may be a long process, all countries have been offered Stabilization and Association Agreements.

The common problem of all Western Balkan states is the weak economy, the high share of the gray economic zone, corruption, unemployment and poverty. Especially in the case of the Western Balkans, overcoming the legacy of the past by achieving reconciliation and solving open issues before their accession to the EU, in particular border disputes, have an extraordinary role. For the Western Balkans regional cooperation and good neighbourly relations are essential for progress on the countries´ respective European paths.

As has already been said in the Report on the State of the Union (EC, 2017), if we want more stability in our neighbourhood, we must keep the enlargement process alive and moreover we must maintain a credible enlargement perspective for the Western Balkans. But the European Union has recently declared towards the Western Balkan countries that their future is European. It is clear that there will be no further enlargement during the mandate of this Commission and this Parliament (EC, 2017). As stated by Bauerová et al. (2014), six Western Balkan countries can be divided into political elites' attitudes towards engaging in EU integration processes. Some of them have long-term interest in access to the European Union, the others can't defy the nationalism and local interests presented by representations of ethnic groups. The EU began accession talks with Montenegro in 2012, and Serbia in 2014. In April 2018 the European Commission proposed to the member states of the European Union to open accession talks also with Macedonia and Albania. Macedonia and Montenegro are quite small countries, and their candidacies are widely supported in the EU. Serbia and Albania have more serious political problems and will likely prove more difficult. Potential

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[2] The EU and six former Soviet countries want to strengthen economic cooperation. At the same time, the EU is pushing for Russia to ensure the territorial integrity of post-Soviet countries. Summit of the Eastern Partnership, which took place in Brussels in November 2017 with the participation of the EU leaders, Ukraine, Georgia, Moldova, Belarus, Armenia and Azerbaijan, economic issues related to further infrastructure development. As the current European Council President Donald Tusk stressed: "We want to strengthen Eastern Partnership cooperation in a number of specific areas such as SMEs, the digital economy and high-speed internet, transport and energy investments. But we would like to strengthen the links between the citizens of our countries and to support civil society more strongly."

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candidate countries, Bosnia and Herzegovina, and also Kosovo, are still ravaged by nationalist passions. In addition, Kosovo is not formally recognized as an independent country by all EU members (namely by Spain, Romania, Slovakia, Cyprus and Greece).

The six-month Bulgarian Presidency (from January to June 2018) has brought this issue to its agenda. Similarly, Austria and Romania, which will take over the relay from Bulgaria, will also consider this to be key. And so the Commission could prepare the Strategy for *'A credible enlargement perspective for and enhanced EU engagement with the Western Balkans'* (adopted on February 6th) confirming the European future of the region as a geostrategic investment in a stable, strong and united Europe based on common values (EC, 2018a). The Strategy clearly spells out that the EU door is open to further accessions when the individual countries have met the criteria. Accession candidates must give the rule of law, justice and fundamental rights utmost priority in the negotiations. Membership negotiations cover 35 chapters, across all policy areas, to ensure that candidates are fully prepared to become members. When negotiations and accompanying reforms have been completed to the satisfaction of both sides, an Accession Treaty is finalised and ratified and the country joins the European Union.

The current Presidency of the European Union under the baton of Bulgaria brings its immediate and more distant neighbors in the Western Balkans new impulses for their peaceful future and economic prosperity and the Western Balkans are clearly drawing closer to the EU. It is no coincidence that the Fourth Meeting of the EU and Western Balkans, held on 17 May 2018, has confirmed a number of concrete measures to strengthen cooperation on interconnection, security and the rule of law, after the publication of the Strategy for Western Balkans. There will be no less than the peacekeeping conditions in Europe by laying the foundations for deeper cooperation on security, migration and tackling geopolitical problems as well as improving energy and transport infrastructure and digital interconnections.

3   Macroeconomic Situation of Western Balkans and Business Opportunities

The EU's doors to the Western Balkans are opening faster in situation when the Russian Federation and China are increasingly interested in this region. European Commissioner for European Neighborhood Policy and Enlargement Johannes Hahn confirmed that the EU could have more than 27 members in 2025. The problem is that none of the six Western Balkan countries have yet a fully functioning market economy. An important source of their wealth is the earnings sent by refugees and gastarbeiter[3] living throughout Europe to their native countries. However, the major drawback for the development of domestic economies is the fact that these economic migrants do not return home, leading to a gradual depopulation of the countryside in particular.

All Western Balkans are poorer than the poorest EU country, which is Bulgaria. In GDP per capita, only Montenegro is at a comparable level with Bulgaria. Moreover, all of these countries (in particular Kosovo) also suffer from high level of shadow economy, which requires substantial changes in the economic governance. The high share of the shadow economy also contributes to the lack of confidence in state institutions, but also in tax administration. The main problem is also corruption and law enforcement.

Therefore, trade and investment are essential for the development of this region. It is therefore highly positive if the EU leaders and the Western Balkan countries agree to take a number of measures to improve the transport and e-transport infrastructure as well as digital connectivity in the region. The European Union is already the largest trading partner. Approximately three quarters of the region's total trade is being made with EU countries. For the EU, the share of trade with the Western Balkan countries is so marginal (it is only 2% of the Union's total trade) even though certain trade advantages flow from the association agreements. These agreements are asymmetrically set in favor

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[3] foreign workers commuting for work from their country of origin (a term known since the 1950s when thousands of Italians and Balkans traveled to Germany for work)

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of the weaker in business relationships. Economic and trade connections can also have a negative impact. The crisis in 2008-2012 caused a fall in demand for Southeastern European goods, which negatively affected the economic growth of the Western Balkan countries.

Given that, the two countries of the region have already begun accession talks (Montenegro in 2012 and Serbia in 2014) they are likely closer to joining the EU. For both countries, the European Union is the largest trading partner (roughly 70% of their exports and more than 60% of their imports). For Serbia, Russia also plays an important role in trade relations, and for Montenegro, and for Montenegro, trading with neighbors in Bosnia and Herzegovina and Serbia is important. Serbia exports cars, electric equipment, fruit and vegetables.

The Czech Republic has a share of only 2.5% in Serbian foreign trade. From the Czech Republic in 2016, goods worth about 447 million euros were exported to Serbia and the products imported for 331 million euros. The Czech exporters also have an opportunity in energy, agriculture and transport. However, the size of the trade does not correspond to the possibilities, as well as the cultural and historical relations of both countries. In particular, the Serbian market seems to be somewhat neglected. Czech entrepreneurs should restore traditional relations and return to the Serbian and Montenegrin markets in a greater extent.

Likewise China is becoming more and more important partner for both countries (Fojtíková, 2016). "China remains open to trade with foreign partners and can only benefit from an economically strong Europe", the Chinese Prime Minister said at a 16 + 1 Summit (on July 7th, 2018). At the same time, it wants closer relations with East European countries. Chinese Prime Minister Li Keqiang confirmed that China will continue to open its markets and make further reforms that have so far helped speed it up economy (EurActiv, 2018). This will give new opportunities to EU Member States and the poorer part of the bloc. Summit in Sofia, besides the EU member states, also included Albania, Bosnia and Herzegovina, Macedonia, Montenegro, Serbia and some of the EU member states that are part of the region.

Table 1. Macroeconomic characteristics of Western Balkans

Indicators (2016)	Montenegro	Macedonia	Albania	Serbia	Bosnia and Herzegovina	Kosovo
Area (km^2)	13 450	25 220	27 400	87 460	51 200	10 887
Population	622 218	2 071 278	2 886 026	7 076 372	3 515 982	1 771 604
GDP per capita (EUR)	6 355	4 691	3 728	4 904	4 494	3 304
GDP growth (annual change in %)	2.9	2.9	3.4	2.8	3.1	3.4
GDP per capita (PPS; EU28=100)	45.0	37.0	29.0	37.0	32.0	N
Price level (EU28=100)	49.0	43.1	43.9	45.9	48.5	N
Annual inflation rate (%, GDP deflator)	5.1	6.3	-0.2	2.5	1.5	-0.3
Unemployment rate (%)	17.7	23.7	15.2	15.3	25.1	N
Export of goods and services (% of GDP)	40	49	29	50	35	22
Import of goods and services (% of GDP)	63	64	46	57	52	51
Gross capital investments (% of GDP)	26.1	32.6	26.3	19.1	19.6	27.6
Foreign direct investments (net flow in mil. USD, current prices)	227	549	1 044	2 300	273	244

Source: Eurostat (2018), World Bank (2018)

4 Strategy and Investment Framework for Western Balkans and Its Impact

In 2018, the EU Commission comes up with its strategy for "convincing prospects for enlargement for the Western Balkans to increase expansion in the region" (EC, 2018b). This confirms the future of the Western Balkans in the EU as a geostrategic investment in the completion of a united Europe. The strategy defines priorities and areas for closer cooperation with the aim of implementing major reforms and improving neighborly relations between countries. The six initiatives announced are

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concrete measures to support the transformation of the Western Balkans, in particular in the area of the rule of law, enhancing security and migration co-operation, extending the energy union to the Western Balkans, reducing roaming charges and introducing broadband connections in the region (EC, 2018c). All this requires financial resources, so the investment framework for the Western Balkans has been published.

The officials of the European Union, the World Bank and the European Bank for Reconstruction and Development were also invited to the aforementioned summit "16+1". The Chinese Prime Minister said that "the participation of these organizations in joint financing of projects in Central and Eastern Europe is more than welcome". China also promised billions of dollars for development projects in the region as part of its "Belt and Road Initiative" initiative (BRI, also known as the New Silk Road), in which it wants to build new export markets (Laš and Poledníková, 2018).

The role of investment to achieve the geostrategic interests of the powers in the world is convincingly described by Perkins (2015). However, the EU´s goal is not indebtedness and the subsequent impoverishment of Western Balkans, but a better link between previously isolated areas. It is important for investments to come to the Western Balkans under the rules known as ESG (environmental, social and governance). ESG investing is the consideration of environmental, social and governance factors alongside financial factors in the investment decision–making process.[4] This type of investment needs to become a mainstream. These ESG rules are now respected by many pension funds, asset managers and even established financial houses. Many of them leave the companies on the basis of their decision to invest ethically. The implementation of the investment framework putting in place guarantee fund, supporting start-ups, access to finance of SMEs and research and innovation for the Western Balkans serves to achieve this goal. In the field of economic interconnection, the creation of a regional economic area is encouraged. The investment support focused on transport, energy, digital economy. Better connectivity will allow for increased competitiveness, economic growth and security of supply. The EU´s Energy Union should be expanded to the Western Balkans. The European Union will support the transformation of energy in the region, in particular through the promotion of renewable energy sources, including the sustainable use of water supply.

The European Union will provide grants for high priority transport projects for the modernization of roads, railways, ports. This investment may result in loans from international financial institutions, including the European Investment Bank. Examples include motorways that would follow *Autoput Bratstvo - Jedinstvo* (Highway Brotherhood-Unity), built in the 1980s, during Tito's Yugoslavia. This should include the interconnection of Serbian Nis with Pristina in Kosovo and the Albanian Durrës called the *Peace Highway* linking Balkan inland with the Adriatic coast. The Adriatic coast should then be bordered by the so-called the *Blue Highway* from Croatia, via Bosnia and Herzegovina and Montenegro to Albania.

Other measures concern the digitalization of the Western Balkan economies by broadband deployment across the region and the reduction of roaming costs between the countries of the Western Balkans and the EU. This initiative also includes the development of eGovernment, eProcurement, eHealth and digital skills, capacity building in digital trust and security in parallel to efforts enhancing the digitalization of industries.

Co-operation in response to the refugee crisis has highlighted the importance of coordinated efforts. It is supposed to be strengthened in the area of migration and border management by sending liaison officers by the European Union. The EU and Western Balkan partner countries have agreed to step up their strategic and operational activities in the field of police and judicial cooperation.

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[4] Today, ethical considerations and alignment with values remain common motivations of many ESG investors but the field is rapidly growing and evolving, as many investors look to incorporate ESG factors into the investment process alongside traditional financial analysis. Many companies are considered unethical in this respect.In addition to armourers, petroleum companies such as Exxon, Shell and British Petroleum are also on the blacklist.

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European Union Justice and Home Affairs agencies, such as Europol or CEPOL[5], will work more closely in the Western Balkans to effectively link internal and external measures to fight all types of cross-border crime. However, the solution to the migration crisis will not be to establish asylum centers outside the European Union in the Western Balkan countries on a migratory route, such as Albania, Macedonia or Bosnia and Herzegovina, whose governments exclude such a possibility.

The Instrument for Pre-Accession supports the Western Balkans in their preparation for accession and facilitates regional and cross-border cooperation. Instrument for Pre-Accession Assistance funding will be even more tailored to the needs of the countries. The implementation of this strategy will require increased funding. While on average 0.8 billion euros a year has been provided over the last 10 years, this figure will increase by almost a quarter in 2018.

5   Conclusion

In a broad sense, once the war is over, there is much in common – all the states of the region are now democracies, albeit fragile, and committed to EU integration. Thus both reconciliation among the peoples of the region, and progress towards EU integration are held up, if not completely blocked, as long as the past is allowed to overshadow present needs and reorientation to the future in political life. The European Union cannot abandon the Western Balkan, which, with the accession of Romania and Bulgaria in January 2007, has become a region wholly surrounded by EU member states. Neither the EU, nor the states of the region really have much choice but to work together – in their common interests – on the long haul towards the future of democratic stability, economic prosperity and EU integration. The European Union has earmarked 220 million euros to implement transport projects, digitalization and energy. These investments can then be multiplied by loans from international financial institutions amounting to one billion euros. The creation of a regional economic area will facilitate trade within the Western Balkans. Economic development will make it possible to lay the foundations for deeper cooperation on security, migration and tackling geopolitical problems. But it is neccessary to provide critical insights that can help institutional investors identify risks and opportunities that traditional investment research may overlook. The investments must be provided under the rules known as ESG (environmental, social and governance).

It will only be won if the people of Kosovo, Macedonia and other Western Balkan countries are not afraid to go to a pub in an ethnically different part of their city (Čechová, 2017), and the local taxi will bring you there without any difficulties. While bridges over rivers like Ibër in Kosovska Mitrovica, Vardar in Skopje, Neretva in Mostar will be the border between ethnicities and not the symbol of their interconnection, the Western Balkan integration process will not be completed.

6   Acknowledgement

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[5] Europol - The European Union Agency for Law Enforcement Cooperation is the law enforcement agency of the European Union formed in 1998 to handle criminal intelligence and combat serious international organised crime and terrorism through cooperation between competent authorities of EU member states. CEPOL is an agency of the European Union formed in 2015 and dedicated to develop, implement and coordinate training for law enforcement officials.

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THE ROLE OF PUBLIC ADMINISTRATION BODIES IN RELATION TO THE UNSUCCESSFUL DRAWING FUNDS FROM THE EUROPEAN UNION IN THE SPHERE OF EDUCATION

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Abstract
The aim of this contribution is to specify the activities of public administration bodies in the Czech Republic when taking legal steps in a situation when the rules of subsidy policy of projects financed from European funds get violated, using examples of bad practices in sphere of education. Subsidy applicants, here public schools, violated in some cases the subsidy regulations and were obliged to return the whole or a partial amount of the funds. In the Czech Republic the Financial Administration of the relevant region and the Supreme Audit Office, or the European Court of Auditors monitor the observance of regulations for financing of European projects. Local administration and self-administration bodies (Regional Council, municipal government, etc.) are a part of the process when authorising, monitoring or solving issues regarding the involvement of educational institutions in European projects within the individual operational programmes. The contribution is not only hypothetical, but also presents us with some relevant real-life examples from the sphere of public education in the Czech Republic.

Keywords
 Czech Republic, Education, European funds, Financial administration, Public institutions, Project.

JEL classification
O22, H43, G32

1   Introduction

European funds are obtained by means of submitting individual or simplified projects within individual operational programmes. In the period 2007-2013, drawing funds from the European Union expanded to a great extent, but due to the initial project boom a great amount of projects failed to be successful as they were overwhelmed by the risks of project management. Such risks may involve predictable and easily influenced causes or hard to influence causes (Němec, 2002) or even unfair practices (MacGregor Pelikánová, 2017). In the context of drawing funds from EU, it is usually the first group of causes that generated the failures of drawing financial subsidies (Fezekas, Chvalkovska, Skuhrovec et al, 2013) that will be further discussed in this contribution using examples from the sphere of public education in the Czech Republic.

 In the programming period 2007-2013, the Czech Republic was allowed to draw 26,7 billion euros from European funds. In addition, the Czech Republic was obliged to fund up the rest from the state budget. The Czech Republic established a scheme of programme documents together institutions to request financial resources from the European Union – just as other members of the European Union did. The basic programme document of the Czech Republic for drawing funds from EU in the period

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2007-2013 was presented by the National Strategic Reference Framework (2007). The mechanism how to draw money from structural funds is based on a group of institutions that guarantee the flow of the specific resources from the European Union budget to the individual EU Member States and to the end beneficiaries. From community bureaus, the European Commission plays a fundamental role in this mechanism (Tõnnisson, Muuga, 2013). On the national level, there are individual implementation bureaus with its main coordinator in drawing funds from EU in the Czech Republic, the Ministry of Regional Development (MRD).

Domestic implementation bureaus are institutions within the national level of EU Member States that participate in the process of co-financing the projects. These institutions provide management, payment, monitoring, inspection and other necessary service when drawing subsidies from structural funds. In the Czech Republic these are, besides local financial administration bodies falling within the competence of the Ministry of Finance (Regional Financial Administration) and the Supreme Audit Office (SAO), the following institutions:

- The Office for the Protection of Competition (OPC),
- The Central Harmonization Unit – an audit office within the competence of the Ministry of Finance of the Czech Republic (MFCR),
- The National Coordination Authority (NCA) within the competence of the Ministry of Regional Development (MRD),
- a managing authority of the operational programme represented by the relevant ministries,
- and The Paying and Certifying Authority (PCO).

At the level of the entire European Union the European Court of Auditors or the European Anti-Fraud Office participate in subsidy policy from the structural funds (Selinšek, 2015).

Not only the applicant – beneficiary of the subsidy, but also the relevant providers of a state-funded organization, usually local self-administration bodies (or more precisely municipal authorities) or the relevant regional bodies may be involved in the process of project financing from the structural funds (with public schools we mean the concrete statutory body).

In the presented contribution the role of the competent national implementation bureaus will be illustrated in relation to their activity when dealing with public schools and their subsidy failures. The attention will be largely paid to the managing bodies of the operational programmes, The Regional Financial Administrations, The Office for the Protection of Competition and the Supreme Audit Office. By this contribution we would like to refer to the lack of methodical support, which is rather formal than factual.

2   Materials and Methods

The presented contribution is not grounded in any existing scientific or summarizing article based on the original research.

The contribution can be thus considered as an original insight into this issue. The text is based on a long-term practical experience of the authors as well as their professional knowledge of the given issue. The research of bibliographic and information sources is irrelevant in the context of this contribution. The specific examples of public administration institutions intervening in unsuccessful drawings from European funds in the chosen sphere of public sector were traced back in popular sources that are open to public. When compiling the article, it was found out that it is rather difficult to trace back the examples of "bad practice" of drawing from the European funds in the sphere of education as well as the role of the relevant institutions of the public administration. This does not apply to the examples of "good practice", which receive a significant publicity.

In the contribution, the current collaboration between the public administration institutions and the entities involved in the drawing from European funds in the sphere of the Czech education is mostly described, supplemented with an analysis of the relevant institutions. The text of the contribution is

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also grounded in the logical induction and generalization of the mentioned individual examples of bad practice and the implication of the theoretically defined roles of the public administration body within the project management of the European subsidies regarding the specific cases of unsuccessful drawing by public schools in the Czech Republic, especially in the programming period 2007-2013.

3 The role of public administration bodies in relation to the unsuccessful drawing funds from the European Union in the sphere of education

The managing body of the operational programmes is stipulated by the government of the state by its resolution, and it is usually an authorized ministry or regional council of the relevant region established on the level of NUTS II region. Its purpose is to secure the realization of the programme entrusted, i.e. to secure its project management in compliance with the EU regulations. The managing body of the operational programme most often performs these activities:

- announces the individual calls to submit the projects,
- releases the documentation for applicants and beneficiaries,
- secures the evaluation of the presented projects and the process of their approval,
- prepares legal documents between the provider and the beneficiary of the subsidy,
- deals with potential discrepancies in the contract,
- stipulates conditions for review in any stage of the evaluation process, etc.

The managing body of the operational programmes secures the so called evaluation, i.e. it examines the treatment with the financial resources of the public budget and helps to maintain the economy of drawing money. It thus evaluates the adjustment of operational programmes and their implementation, first before the launching of the programme, then in the middle of the programming period and lastly after its termination (MFCR, 2005).

Regarding the objective of this contribution, the managing body of the operational programme represented by the Regional Council of the South-West Cohesion Region had to interfere in case of the construction of a new kindergarten in Poběžovice municipality in Domažlice region. Here an adjustment of European subsidy amounting to 12 million CZK had to be done, as the municipality being the founder was mistaken when assigning the bidding for the building supplier setting a criterion that could have been discriminating.

The Regional Council did not decide for the correction until there was an expert opinion made by a court expert. The criterion that was incorrectly set is the so called index of credibility for the companies that are applying for the contract. Here Poběžovice municipality allegedly set the index level too high and thus discriminated companies that could not reach it. The Office for the Protection of Competition also looked into this matter but did not find anything faulty. Yet the Regional Council is not obliged to accept the verdict of the Office for the Protection of Competition, and it actually did not accept it in this case. The verdict of the Office for the Protection of Competition is not binding in any way in relation to the European Union and it is not authoritative at all for European inspecting authorities (vz24cz, 2012b).

A great deal of projects also failed due to their non-transparent project documentation processing when a lot of schools asked companies to process the tender for them while the same companies took part in the tender at the same time. Schools, or more precisely their founders, deprived themselves of the chance to choose the best bid, as the contract conditions were „tailored" to the company that was assisting the one or the other school. Schools thus violated the internal rules for providing of European subsidies (Aktuálně.cz, 2011).

Both Ústecký and Karlovarský Regions allegedly committed a mistake the same way when distributing funds from the development operational programme for the North-West Cohesion Region in the project of a new building of the Integrated Secondary School of Technology and Economics in town of Sokolov. The regional administration assessed the bids not only by their price, but also by

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the ability of individual company to harmonize the construction with the daily operation of the school, and thus the criterion of the tender was subjectively influenced to a great extent and was not described in the project sufficiently. The subsidy itself was examined by the European Anti-fraud Office. The European Commission made a financial adjustment and the amount of the subsidy was reduced (iDnes, 2013b).

In the case of an accredited ministry as a managing body of the operational programme, the Ministry of Education, Youth and Sports had to verify the correctness of the services concerning the internal rules of the EU in the case of the Primary School in Veřovice municipality in Novojičínský region. The school allegedly behaved in a discriminatory manner when setting criteria of the tender for requesting the funds to purchase modern teaching aids from the Operational Programme Education for Competitiveness. The inspection of the Ministry of Education, Youth and Sports found irregularities in the tender for a technical equipment supplier. The Financial Administration ordered the school to return the subsidy amounting to 420 thousand CZK together with 200 thousand CZK as a penalty (vz24cz, 2012a; Czech Television, 2012b).

The Secondary School of Nymburk allegedly committed a mistake when organizing a trip to England together with language courses for teachers and primary and secondary students from schools in Nymburk region under the Operational Programme Education for Competition under the patronage of the Ministry of Education, Youth and Sports. The mistake was caused by addressing only 4 instead of 5 potential suppliers, and thus the obligation to address more bidders was violated. This was rather a formal mistake, not an irregular use of European funds. It is interesting though that regular inspections failed to spot the mistake when settling up the monitoring report, and the mistake has not been discovered until the final inspection at the end of the project. The Council of the Středočeský Region exempted the school from returning 75 % of the amount (Region is the founder of the secondary school) and school was obliged to return the remaining 25 % using its own resources (Deník.cz, 2013).

In the project „EU Money to Schools" that was supervised by the Ministry of Education, Youth and Sports as the managing body of the operational programme Education for Competition, a mistake was found for instance in the case of the Masaryk Primary School in Dymokury municipality in Nymburk region that obtained approximately one million CZK from the project, but was obliged to return some part of it (approximately 347 thousand CZK).

The inspection of the ministry did not accept any additional adjustments of the contract for work and materials with the company providing the purchase of interactive boards and computer room equipment. An amendment of the contract, even with a good intention, means violating the rules that were set when implementing the European projects. The contract was adjusted so that the school would not be behind with the payment and thus avoid sanctions that would have to be paid from the school´s own resources, as the money from the Ministry of Education, Youth and Sports had not been credited yet (iDnes, 2013a).

The same project called „EU Money to Schools" also failed to succeed in Ploskovice municipality near town of Litoměřice in Ústecký Region. The local primary school purchased rather costly computers for 700 thousand CZK and drawing money from another project called „Step by Step" allegedly equipped classrooms for social science for almost 5 million CZK. The new management of the school tried to terminate the second project by mutual agreement being aware of the overpricing, but failed to do so. There was no manager of the project and no monitoring report, so the Region withdrew from the contract due to a breach of the contract obligations and the school was obliged to pay back the deposit of almost 1 million CZK together with the sanction. As was found out by European inspectors, some of the city councillors and regional politicians across the political spectrum „were making money" from the projects in the same way (Neviditelný pes, 2013).

As it results from the previous examples, financial administration body of the relevant region is in charge of financial management along with the managing body of the operational programme that supervises the public administration. When uneconomical, ineffective or purposeless utilization of

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financial resources from the project budget is uncovered or when the regulations of EU and the Czech Republic are violated, the chief of the relevant institution (e.g. the headmaster) is appealed to remove the deficiencies. If they fail to do so, the relevant institution is imposed by sanctions.

Regional financial administration bodies control obligations stipulated both by legal regulations and by the provider, and if there is a breach of these obligations the whole or a partial amount of the funds must be returned, or the subsidy is reduced (financial correction is performed), or else legal penalty is imposed. In this case we speak about violating the budget discipline. The basic sources of information in the control process are accounting and financial statements of entity (Pakšiová, 2016). Regional financial administration bodies come under the Ministry of Finance which is the central body for financial inspection and which in accordance with relevant provisions of the Act No. 2/1969 Coll., on the establishment of the ministry and other central public administration bodies of the Czech Republic as subsequently amended (2016a), methodically manages, coordinates and is in charge of financial inspection.

The next key institution for supervision of obligations that are described in the project documentation is the Supreme Audit Office of the Czech Republic (SAO). This office administers independent control activities in sense of particular provisions of the Act no. 166/1993 Coll., on the Supreme Audit Office of the Czech Republic as subsequently amended (2016b). The Supreme Audit Office is authorized within the EU subsidy inspections to provide results of these inspections to the European Anti-Fraud Office concerning management of financial resources provided by the EU funds. These inspections are of public character which is due to the obligation of the Supreme Audit Office to publish audit reports in the SAO bulletin in accordance with the Act no. 166/93, § 45, on SAO. The inspection as performed by the SAO represents the standard protection of the inner market and public finances in the Czech Republic, which means that SAO performs inspection regardless the implementation of operational programmes and support from the European funds.

In the context of activities of the Supreme Audit Office of the Czech Republic (SAO) and European projects that failed to succeed in the Czech educational sector, a certain warning from SAO regarding the condition of projects sustainability might be mentioned. The programming period 2007-2013 was distinctive in the sense that most of the supported projects were obliged to secure a five-year period of sustainability from their own resources after the funding from European Union had terminated. During this five-year period every beneficiary has to secure sustainability of the selected activities that are described in a particular section of the article called The decision on providing the subsidy. The costs for funding these activities are fully covered by the beneficiary. Some schools didn't pay a proper attention to the sustainability of projects during their preparatory stage and failed to adjust the extent of the activities in such a way that would allow them to cover all the resources from the operating costs of the state-funded organisation. When the provider of the subsidy during the control of the sustainability discovered that the project activities were not being realized, this fact was reported to the related branch of the Financial Administration to be further investigated. The similar procedure followed as it happens when a breach of budget discipline is detected. Thus some beneficiaries were obliged to return a proportional part of the subvention even several years after the termination of the project.

The Elementary School in small town Pecka near the Giant Mountains might serve as an example of a project that guaranteed sustainability. Using the European funds, the school building was converted to be barrier free and some of its vocational classrooms were reconstructed. Here the problem occurred when the building with the reconstructed classrooms, for which the school obtained the subsidy, had to be closed down due to the lack of students (Czech Television, 2012a). Generally, the risk of „non-sustainability" is a big threat for small schools in municipalities where population number and natality is decreasing and schools are not able to meet the obligations regarding their sustainability.

Another example of violating sustainability conditions is the project of the Ministry of Education, Youth and Sports to create centres for support of inclusive education at elementary schools for more

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than 133 million CZK. In this project nine regional centres for support of inclusive education were closed down without any compensation after the project had finished. Another problem is funding of projects during the period of their sustainability, which is usually covered by public body (founder) and thus it is not directly funded by the European funds any more. This risk has been widely debated in the media in context with several research and development centres that were funded by costly projects of the Operational Programme Research and Development for Innovations. Based on the inspection of the Supreme Audit Office of the Czech Republic five out of eleven centres are facing up breaking the condition of sustainability, as they are failing to find some other sources of finance subsidy, primarily in the application sphere. The attention has to be paid to the practical and effective utilisation of the research results of the projects even after their termination, which means that the EU subsidy should not only support the project itself but also support long-term improvements in the given sector. And this fact has been omitted during the submissions of the project proposals (NKÚ, 2016).

The founder of public schools such as municipalities, city or regional administration may also enter the whole process of project management when there is an obligation to return a partial or the whole amount of the subsidy, or a certain penalty has to be paid. These institutions are then frequently requested by persons responsible for the unsuccessful project to help them with financing the requested money together with the penalty. Frequently both the applicant of the subsidy (school) and its founder participate on returning of the subsidy.

4   Conclusion

The paper has illustrated by means of practical demonstrations the role of implementation institutions in the Czech Republic when dealing with subsidy failures of public schools. First of all, it has to be pointed out that a number of schools committed a mistake unintentionally due to the lack of appropriate methodological support from the school authorities. Thus schools had to solely rely on their own employees and due to the lack of their experience and extreme rigidity of Public Procurement Act maladministration occurred that resulted in sanctions given to schools by the local financial administration body.

The system of European subsidies in the programming period 2014-2020 opens up opportunities as for their future development, yet it does not create suitable absorption conditions by use of an effective management risks system that would prevent potential problems. In this sense managing bodies of individual operational programmes should play an important role to ensure the improvement of the process.

Despite certain imperfections that can occur when drawing funds from the European Union, these funds represent an important financial tool for further growth of competitiveness of schools.

5   Acknowledgements

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AN IMPACT OF DISHONEST INSURERS' PRACTICES ON THE CONDITION OF THE MARKET AND DEVELOPMENT OF PRO-CONSUMER POLICY IN LIFE INSURANCE IN POLAND

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Abstract
In recent years in Poland the phenomenon of increased dissatisfaction with policies, in particular those of investment nature, has been observed. The main reason of such a situation is the sales of products that are unnecessary or those which do not meet the needs of customers. As a result of this phenomenon, which is referred to as misselling, a number of complaints from buyers of savings insurance services in unfair market practices applied by insurance companies to the supervision and protection institutions is increasing. The aim of the paper is to present some examples of the use of unfair market practices by life insurance companies that run an insurance activity in Poland. Based on the analysis of trends in the number and type of complaints submitted to the supervisory and protection institutions in 2010-2017, the main reasons for customers' negative attitude to life insurance and the problems of the market of investment insurance products were specified. The need to tighten regulations regarding the regularity of sales of insurance services was stresses, in particular the need to conduct consumer protection policy and information policy about product possibilities and solutions.

Keywords
Consumer protection, Dishonest insurers' practices, Life insurance market, Misselling.

JEL classification
D18, G20, G21, G22, G23

1   Introduction

The functioning of the Polish life insurance market in recent years, especially after the crisis in the financial markets and a decline in confidence in financial institutions was characterized by increased dissatisfaction of clients with investment policies, in particular the contracts related to insurance capital funds (ICF).

The conduct of improper policies by insurance companies or misinformation is referred to as unfair market practices. Their forms are manifested, among others, by insufficient transparency of information provided to customers or sales in bad faith by using ethically and legally questionable sales practices described as misselling. An application of such practices resulted in a decrease in a purchase interest, negative ratings of buyers, an increase in the number of complaints submitted to supervisory institutions and consumer protection of the insurance market. On the other hand, it made the legislators aware of the need to address actively the tightening of consumer protection policy, to conduct a transparent information policy towards buyers, to inform the customer about product possibilities and solutions, investment efficiency, and in particular about additional purchase costs and liquidation fees.

The aim of the paper is to present the reasons for the creation, the essence and examples of the use of unfair market practices by life insurance companies that run an insurance activity in Poland. The study includes an analysis of trends in the number and type of complaints submitted to supervisory and protection institutions in 2014-2017. It specifies the main reasons for clients' negative approach to life insurance, as well as the condition of the insurance market structure of investment products as a result of observed problems.

2   Literature review

Information obligations of insurers are currently one of the main instruments for the protection of purchasers of insurance services. A critical analysis of the literature indicates that for a long time the

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issues regarding pro-consumer policy in the life insurance market seemed quite insignificant. Increasing the activity in the area of tackling the issues of consumer protection of financial services was associated with huge changes that took place after the great crisis of 2007-2009. Its causes were particularly seen in the lack of transparency of information regarding the form of financial instruments. In any case, the direct cause of falling prices in the market of structured credit derivatives and the beginning of the 2007-2008 crisis was the breakdown in trust in the credibility of their valuation (Krześniak, 2009). The lack of transparency of information, which caused a drop in confidence in financial institutions, triggered a discussion on the nature of appropriate remedies. In particular, the so-called "supervisory" trend that called for more regulation of the financial market (CGFS, 2008) and the need to introduce new regulatory and supervisory standards (Eatwell, 2009), and above all a new concept called the Basel consensus were more noticeable. They replaced the current regulatory paradigm and changedthe perception of financial markets, impact instruments and nature of supervision (Monkiewicz and Monkiewicz, 2015). The attention was given first of all to the policy of credibility of the financial system infrastructure and its more safe functioning (Nichols, 2009), (Baker, 2009) that imposed a greater significance of public intervention with the application of protective regulations related to consumer rights in the financial market (Baker, 2013).

The manifestation of these activities was, inter alia, an introduction and development of surveillance information systems, including the supervision of insurance companies (Kurek, 2015). The studies on the new financial supervisory framework pointed to the need to ensure safety for individual entities. In 2017, the European Insurance and Occupational Pensions Authority (EIOPA) pointed out the need to initiate systemic risk issues in insurance, which should contribute to a different view of unit safety issues, taking into account their weaker position compared to insurance companies (EIOPA, 2017). Overseeing the protection of consumer rights in order to prevent destabilization of the entire system is more often treated as a form of separate and independent supervision (Monkiewicz and Monkiewicz, 2015).

The lack of transparency of information and the entire financial system results from the fact that many types of risks "hide" outside the balance sheets of specific financial institutions. This problem was already pointed out during the financial crisis, paying attention to the need to radically increase the transparency of the entire financial system (Fisher, 2008). Currently, the development of the insurance market results in many threats that result not only from improper information policy of insurers, but also from the low level of knowledge and insurance awareness of market customers.

Life insurance with a strictly investment nature is becoming an important instrument in personal finance management[1]. Unfortunately, it is this type of product that is most often exposed to limited transparency of information, which is particularly dangerous for the customer, especially since these products are characterized by a considerable degree of complexity (Łańcucki, 2017). The problem of the transparency deficit results from the product design and the comparison of the offers of different insurers appears already at the time of necessity. In addition, there is a need to compare parameters presenting the profitability of the investment part of insurance assuming different levels of yield ratios for instruments related to them. Consumers of this type of services most often are not aware of the difference in the construction of the applied parameters, they do not know the characteristics of financial instruments, or they cannot convert one type of rate into another (Frączek, 2017). The low transparency results also from the complex language of the content of the general insurance conditions, in particular regarding the determination of underlying assets, participation rates and explanations of investment opportunities as a result of working out specific rates of return on the

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[1] In the European Union, premiums from insurance connected with a possibility of investing in insurance capital funds already account for almost 20% of the whole life insurance premiums collection, and in Poland the insurance from group 3 (life insurance related to ICF) dominates, with a premium being 45, 98% of the total premium of Section I, where 9.29% of ICF assets (PLN 5.49 billion) are life insurance contracts related to civil insurance funds investing in structured instruments or derivative instruments in connection with offering insurance-based investment products (KNF, 2018).

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product (Ostrowska-Dankiewicz, 2017) or the occurrence of multiple types of administrative burden (Ostrowska-Dankiewicz, 2006).

A relatively poor number of literature items in the field of insurance market safety was enriched with publications on the problem of the use of unfair insurance practices by insurance companies. The discussion on this subject was initiated after the complaints about the growing problem regarding inadequate investment-related life insurance services started to affect the courts, financial institutions and financial supervision. Unfair market practices were considered misleading, aggressive market practices and the use of a code of good practice contrary to the law (Chmielowiec, 2015). This problem also forced the determination of appropriate legal provisions in this area. Legal regulations regarding unfair practices in the Polish market were specified in the Act of 23 August 2007 on Counteracting Unfair Market Practices (The Act, 2007), which was an implementation of the European Parliament and Council Directive (European Commission, 2005) on unfair practices in the internal market.

Unfair market practice is considered to be one that is contrary to good morals and significantly distorts the market behavior of the average consumer before concluding a contract for a product, during or after its conclusion. Unfair market practices are divided into so-called black or misleading and gray practices referred to as aggressive (Folwarski, 2018). The set of practices prohibited by law was given a closed character, and in practice more and more often operates under the name of the "black list" (Stefanicki, 2009). Such practices include, among others, presenting unreliable information about the type and degree of risk that the personal safety of the consumer or his family will be exposed to if he does not purchase the product. In addition, these are often acts of unfair competition in the field of advertising, among others messages referring to clients' feelings by calling fear (Tereszkiewicz, 2015). The state of threat awakened by a suggestive message and excessive exposure of risk usually leads to disruption of consumer market behaviors (Sieradzka, 2008).

Due to the diversity of illicit activities, the catalog of unfair practices introduced a transparent division into misleading activities based on false information and practices that have an ability to mislead the addressee about market relations or offer, which resulted in the emergence of a new misselling concept - misselling. The term was first used in the United Kingdom, where it appeared in the legal system as a serious violation of market rules and was a subject to sanctions (Urząd Ochrony Konkurencji i Konsumentów, 2016), and in Poland its development trend was noticed along with an increase in complaints to the Insurance Ombudsman regarding insurance for living with ICF (Gadomska-Orłowska et al., 2012).

Misselling defines the type of practices that are intended to mislead consumers as to the mechanism of functioning of the offered product, its function and an application (an advertisement or a brochure omitting relevant information). In Poland, the phenomenon of misselling was also defined as a failed or bad sales (Butor-Keler, 2017). The driving force behind the development of this phenomenon was excessive profit orientation (Lisowski, 2015) resulting in the use of financial incentives for additional sales and high sales plans, which in turn contributed to the lack of proper quality of customer service (Pisarewicz, 2014). The main features of misselling in insurance include the inadequacy of the product to the customer's needs (e.g. sales of long-term products to the elderly), lack of information on the structure of the instrument and the structure of the investment, risk or calculation of client's income (Cichorska, 2017).The answer to the use of misselling is to tighten regulations regarding the safety of financial market customers and to increase the control of observing the principles of good practice. Recognizing the problem at EU level, a recommendation was adopted on the cessation of unlawful practices regarding violations of rights granted under European Union law (European Commission, 2013). In addition, *Consumer Protection Aspects from Financial Services* formulated recommendations aimed at minimizing information asymmetry, monitoring offered services, especially in terms of prices, commissions and sanctions and penalties for inappropriate practices (Muller et al, 2014).

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In Poland, the fight against misselling started practically in 2013 by creating a register of prohibited clauses kept by the Office of Competition and Consumer Protection (Orłowski, 2013) (Wierzbicka, 2016). The Polish Financial Supervision Authority also undertook remedial actions, issuing, among others, the so-called U Recommendation (KNF, 2014). The result of the increased state supervision was an adoption of the Act on dealing with complaints by financial market entities and on the Financial Ombudsman (The Act, 2015) and the reference to unfair sales in the amended Act on competition and consumer protection (The Act, 2017).

3 Data sources and research methodology

The phenomenon of unfair market practices applied by insurers in the Polish life insurance market was examined based on a critical analysis of literature, legal regulations and based on historical data from 2010-2017 obtained from the Association of Advertising Councils, Financial Ombudsman and Polish Financial Supervision Authority. The research period resulted from an attempt to determine an impact of the financial crisis of 2007-2009 on the intensification of dissatisfaction of life insurance policyholders related to ICF and to pay attention to the phenomenon of misselling.

The conducted research based on data from the internal reports included a quantitative analysis of the structure of complaints handled by the Advertising Ethics Committee and written complaints reported in individual cases brought to the protection institutions. The analysis covered the tendencies of changes in the subject of complaints based on the number and percentage of complaints about individual insurance groups in all complaints about the insurance sector, as well as the diagnosis of problems in the Polish life insurance market based on complaints about features and construction components of life insurance from ICF. The condition of the market of these policies was examined based on the data of the Polish Financial Supervision Authority regarding changes in the market structure based on data on the general gross written premium in life insurance.

4 Results of research

An important function of advertising for insurance products, in addition to the most important information element, is a possibility for potential clients of creating the conviction of the legitimacy of purchasing them. Therefore, advertising, being an instrument for creating a belief in the usefulness of a specific insurance product, may be a form of stimulating consumer behavior in the form of acquiring specific products. In fact, the informative function should be carried out reliably, and the advertisement should not be misleading. But, instead of informing, it is very often misleading, as indicated by the number of complaints made by consumers to the Advertising Board in 2010-2017 (Fig. 1).
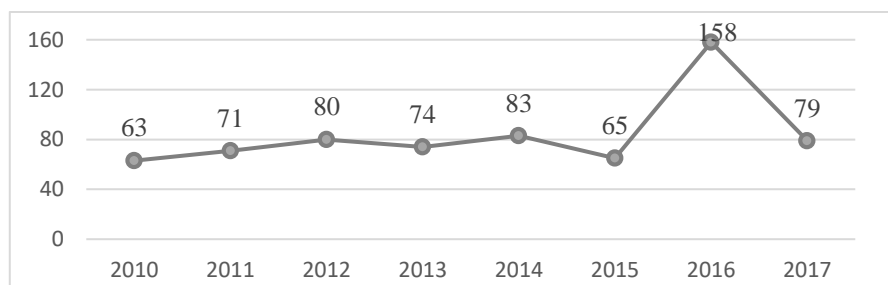

Fig. 1. Number of complaints made by consumers to the Advertising Ethics Commission about misleading advertising (Source: author's own study based on data from the Polish Union of Association Advertising Council).

Consumer complaints about unfair misleading practices fluctuated around 70-80 per year. In 2012, when special attention was paid to misselling in Poland, the number of complaints about misleading

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was 80. A surprisingly high level of complaints was noted in 2016, which in relation to 2012 increased almost twice. It should be noted that these complaints most often concerned online advertising.

Complaints about financial institutions, including the largest amount of insurance, were reported in 2012 and they represented almost 20% of total complaints (Fig. 2).
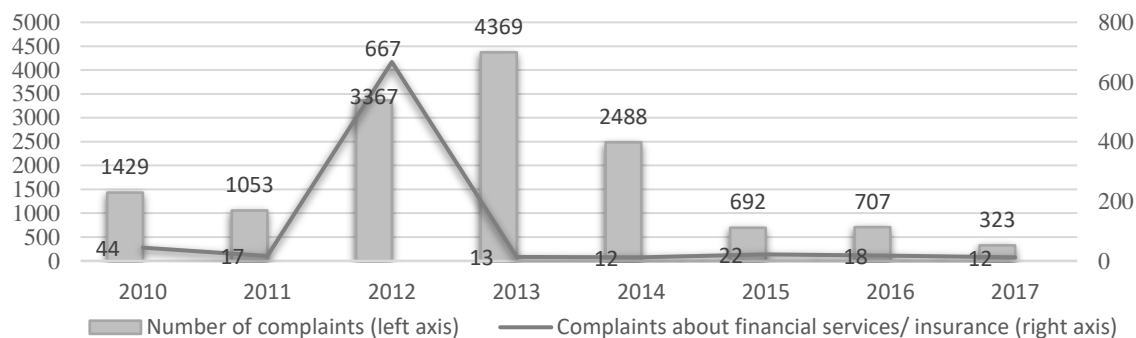
Fig. 2. Number of complaints made by consumers about financial/insurance institutions to the Advertising Ethics Commission (Source: author's own study based on data from Union of Association Advertising Council).

It is surprising that in the following years, despite an increase in the number of complaints in general, the number of complaints about financial institutions was very small and constituted a dozen or so reports per year, which indicates a measurable effect of the fight against misseling initiated in Poland.

The breakdowns in the life insurance market are most often associated with the liquidation of policies, or a reduction in the demand for specific types of products. Most often, this phenomenon results from the growing dissatisfaction of consumers and is associated with the use of bad practices by insurers. The changing number of complaints about individual insurance which were reported to the Financial Ombudsman (Table 1) are a reflection of the growing scale of the phenomenon. When analyzing the number (L) and percentage share (%) of complaints about individual insurance groups in all complaints regarding the insurance sector[2] reported to the Financial Ombudsman in 2010-2017, it should be noted that in the whole period the number of complaints showed an upward trend from 1,600 per year to 4,859, i.e. an increase by over 203%.

Table 1. Complaints made to safety institutions about individual life insurance groups

Specification	2010		2011		2012		2013		2014		2015		2016		2017	
	L	%	L	%	L	%	L	%	L	%	L	%	L	%	L	%
Section I total*	1600	13.4	1957	13.6	2462	16.1	3537	21.4	3878	25.1	3141	27.1	4396	33.7	4859	33.8
Group 1	458	3.8	583	4.1	653	4.3	825	5.0	817	5.3	761	6.5	755	5.8	1002	7.0
Group 2	8	0.1	16	0.1	9	0.1	16	0.1	9	0.1	13	0.1	25	0.2	13	0.1
Group 3	103	0.9	146	1.0	516	3.4	1216	7.4	1422	9.2	937	8.1	1053	8.1	758	5.3
Group 4	6	0.1	2	0.0	b.d.	b.d.	3	0.0	5	0.0	6	0.1	12	0.1	7	0.0
Group 5	831	6.9	1063	7.4	1152	7.5	147	8.7	1594	10.03	1396	12.0	2528	19.4	3041	21.2

Source: author's own study based on the reports of the Insurance Ombudsman and the Financial Ombudsman.

At the same time the attention should be paid to the fact that the share of claims regarding life insurance in complaints concerning the entire insurance sector increased by over 150% in the analyzed period. In the audited period consumers, starting from 2012, reported more and more comments on ICF products. In 2012, the highest increase in the number of complaints occurred (by over 250%), although in 2015 and 2017, taking into account data from year to year, downward trends were recorded, by 34.1% and 28%, respectively. Taking into account the subject of complaints

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[2] In Section 1, i.e. Life Insurance, there are 5 insurance groups that were named as follows: 1. Life insurance, 2. Child endowment policy 3. Life insurance related to the insurance capital fund (ICF), 4. Disability insurance, 5. Accident and sickness insurance, supplementing groups 1-4.

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submitted for life insurance, it should be pointed out that the relatively high dissatisfaction with life insurance products maintained in 2010-2017 was rooted in typical construction elements of investment products (Table 2).

Table 2. The subject matter of life insurance complaints

Specification	No. of complaints								
	2010	2011	2012	2013	2014	2015	2016	2017	2010-2017
Understated value of policy coverage	67	81	138	155	123	226	432	491	1713
Incorrect policy management	17	54	61	30	25	23	26	43	279
Refusal to buy the policy	16	13	12	13	12	13	16	5	100
Dismissal of the claim	944	1152	1245	1612	1701	1866	2279	2621	13420
The dispute as to the amount of the benefit granted	238	379	428	438	480	517	842	1097	4419
Sloth in liquidation proceedings	89	76	62	56	78	76	31	42	510
Contributions: amount, refund, request for payment, etc.	102	80	357	1203	1299	753	585	397	4776
Refusal to continue insurance	19	16	33	25	20	30	29	49	221
Procedures applied by an insurance company	78	68	92	50	36	43	32	47	446
Change in the sum of insurance	1	3	7	7	5	2	5	4	34
Change of the GTC during the term of the contract	8	6	4	10	10	3	11	4	56

Source: author's own study based on the reports of the Insurance Ombudsman and the Financial Ombudsman.

The issues of complaints addressed to the Office of the Ombudsman indicate that the most frequently raised charges against insurers in the life insurance department were: refusals to accept the claim by the insurance company (51.67%), contributions (18.39%), disputes regarding the amount of the benefit (17, 01%), too low or total refusal to pay the policy redemption value (6.59%) and tardiness in liquidation proceedings (1.96%). However, a growing number of complaints addressed to the Financial Ombudsman Office has no impact on the popularity of ICF (group 3) of insurance, which is reflected in the growing percentage of these insurances in the market of all life products (Table 3).

Table 3. Structure of the life insurance market in Poland in 2010-2017

Group	Specification	Share in the gross written premium (in %)							
		2010	2011	2012	2013	2014	2015	2016	2017
1	Life insurance	59.70	52.94	53.35	42.06	37.08	32.17	32.79	30.55
2	Child endowment policy	0.38	0.35	0.32	0.36	0.40	0.43	0.53	0.46
3	Life insurance related to ICF	26.06	32.45	33.15	41.78	43.98	47.25	43.32	45.98
4	Disability insurance	0.27	0.31	0.27	0.34	0.40	0.48	0.58	0.55
5	Accident and sickness insurance, supplementing groups 1-4.	13.59	13.95	12.91	15.46	18.14	19.67	22.78	22.46

Source: author's own study based on reports from the Polish Financial Supervision Authority.

An increase in interest in group 3 of insurance observed in 2010-2017 was broken only in 2016. The share of gross written premium from these insurance decreased by almost 4%, which was undoubtedly influenced by the opinions of customers. Taking into account the data presented in Tables 1 and 3, a certain contradiction is surprising as the most popular products are rated the lowest by consumers.

The same relationships can be seen in the ranking of 44 consumer markets created by the European Commission to examine the level of consumer confidence and the scale of problems they create. The investment products market in the European Union took the 41st position and in Poland the 43th – the last position (European Commission, 2016). This situation is undoubtedly due to the fact that it does not present the exact terms and financial possibilities that investment insurance implements.

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5 Conclusion

The crisis in the financial markets proved to be a serious test and echoed also for the insurance industry proving its imperfections. The initiation of the discussion of the problem of unfair market practices applied by insurance companies, especially in the field of poor sales of ICF-related insurance, resulted in a number of actions which were additionally motivated by the growing scale of complaints about investment policies. However, a negative assessment of purchasers of such insurance, expressed in complaints to various institutions in the examined period, indicates that the effect of tightening regulations on the insurance market customers' safety and increasing compliance with good practices is already being observed.

It is surprising that despite the high number of complaints in the years 2011-2013 regarding ICF insurance their growing share was recorded from around 32% to 41% in the whole life insurance portfolio. Reduction of the level of dissatisfaction and the growing popularity of life insurance from ICF show that adequate transparency and a sense of safety for customers with fully customized products should be still included in the market regulation mechanisms, both by service providers and by institutions of protectiona and supervision to ensure proper development trends of the insurance market in the future.

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THE REQUIREMENTS FOR A DISCLOSURE OF NON-FINANCIAL INFORMATION ACCORDING TO LEGAL REGULATIONS IN SLOVAKIA AND CZECHIA

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Abstract
Disclosing the non-financial information is an actual topic in more and more countries. Not only the UN and the European Union are concerned with environmental, social and economic sustainability issues, but Czechia and Slovakia are gradually setting up the legal framework for reporting in line with a true and fair view of the business entity as well. At present, it is not limited only to the financial situation of the subject but also extends to the image of its impact on the social environment that concerns both the environment and the social environment in which it operates. The user of the subject information takes an overall view of all the available aspects of the assessment in the social environment of its activities, therefore setting up standardized reporting methods for both financial and non-financial information is important not only in the present but also in the near future. The aim of this paper is the theoretical analysis and comparison of requirements for the reporting and disclosure of non-financial information according to legal regulations in the Czech Republic and the Slovak Republic in the context of sustainability of economic policy. The Slovak Republic and Czech Republic as the EU Member States have the legal framework for reporting the non-financial information in line with EU requirements and a legislative framework applicable in the European Union. Disparities in the both counties are in a specification of companies and in a concretization of information.

Keywords
Annual Report, Corporate Social Responsibility, Non-Financial Information, Separate Report, Sustainability.

JEL classification
G38, K23, M14, M40, M48

1 Introduction

Basic tasks of the state economic policies in the form of the management and segmentation of the production, exchange and consumption of services and goods in a specific socio-economic environment cannot be implemented without a participation of an entrepreneurial sector that is the only producer of values usable in the economic policy instruments. Economic policy instruments also include social and environmental policy instruments the application of which is to a great extent influenced by the entrepreneurial sector itself as well as by its attitude to the social responsibility management. In some cases, it is predominantly large corporations that are economic policy goals implementers, therefore they may be considered their carriers.

The basis for the sustainability of economic policy is the application of social responsibility by states and companies as well, which has a huge impact on the societal, economic and social aspects of companies working within a society. The European Union is aware of the importance of the sustainable development strategy and of the opportunity and risks of economics globalisation process in this field (Melecký, 2017). It endorses the social responsibility in its strategies and reflects this attitude in its legal acts on business environment in the European Union. Availability and disclosing the non-financial information about providing corporate social responsibility is a highly actual topic in more and more countries. Not only the United Nations and the European Union are concerned with environmental, social and economic sustainability issues, but Czechia and Slovakia are gradually setting up the legal framework for reporting in line with a true and fair view of the business entity as well. The aim of this paper is the theoretical analysis and comparison of requirements for the reporting and disclosure of the non-financial information according to legal regulations in the Czech Republic and the Slovak Republic in the context of sustainability of economic policy.

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2 Literature review

Terms "sustainability" and "sustainable development" come from the 70's, initially used in connection with the idea that an uncontrolled growth of anything (population, production, consumption, pollution, etc.) is not sustainable when resources are limited (Petera, P. and Wagner, J., 2015, Martinát et al., 2016). As claim Majerova and Nevima (2016), from the macroeconomic point of view, the sustainable development can be not expressed by mostly used indicators, as gross domestic product or gross national income. A greater explanatory power has the Human development index (HDI), which is to follow economic (and above mentioned) development in general. The Friedman and Miles (2002) model concentrates on the analysis of the organization/stakeholder relationship, which is not exclusively from the organization perspective and which is capable of illuminating why and how organization/stakeholder relations change over time, what is important as well. Stakeholder engagement is recognized as a key process to align firm and stakeholder interests and to identify material content for sustainability reporting. (Moratis and Brandt, 2017) Non-financial and financial reporting provides shareholders and other stakeholders with a meaningful, comprehensive view of the position and performance of companies and groups in the past, present and predictable future, what it is the reason, why they are so strong regulated. (Lovciová, 2017)

The European Union is interested in environmental, social and economic sustainability issues along with market and fairness concerns (MacGregor Pelikánová, 2017). Still actual is discussion about efficiency and implementation of the Europe 2020 Strategy goals (Staníčková, 2017). The European Union gave its clear position towards the support of socially responsible undertakings, among others, in its EU Horizon 2020 programme priorities for 2018-2020, as well as in its specification of cross-sectional priorities – climate action and sustainable development; gender equality and the social sciences and humanities – SSH. (European Commission, 2014, European Commission, 2016) The European Commission (European Commission, 2013) has launched a public consultation on the non-binding guidelines on methodology for reporting non-financial information following Article 2 of Directive 2014/95/EU on disclosure of non-financial and diversity information by certain large undertakings and groups. The purpose of this public consultation was to collect views from stakeholders. The consultation was part of the Commission work related to preparing non-binding guidelines on methodology for reporting non-financial information, and this in particular in the digital setting (MacGregor Pelikánová and MacGregor, 2017). Currently valid is the basic legal act, Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 (EUR-LEX, 2013) on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC and 83/349/EEC as amended by Directive 2014/95/EU (EUR-LEX, 2014) of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of the non-financial and diversity information by certain large undertakings and groups – Directive 2014/95/EU. Guidance on reporting dealing with the non-financial information reporting methodology including non-financial general and sectoral key indicators of behaviour, aimed at facilitating relevant, useful and comparable non-financial information disclosure for the undertakings had been prepared by the European Commission and was published in the Official Journal of EU on July 5, 2017 as Guidelines on non-financial reporting (methodology for reporting non-financial information). (Publications Europa, 2017)

Large public-interest entities in the EU (listed companies, banks, insurance undertakings and other companies that are so designated by Member States) with more than 500 employees as the most important companies for the stability of economic policy should disclose in their management report relevant and useful information on their policies, main risks and outcomes relating to at least environmental matters, social and employee aspects, respect for human rights, anticorruption and bribery issues, and diversity in their board of directors. Public-interest entities have different definitions not only in different counties, but also in one country in different acts, it should be consolidated soon for gaining more clarity (Ondrušová and Kňažková, 2017). In reporting, there is a

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significant flexibility for companies to disclose relevant information, including reporting in annual reports or separate reports, as well as they may rely on international, European or national guidelines (e.g. the OECD Guidelines for Multinational Enterprises, ISO 26000, the UN Global Compact, etc.).

3   Methodology and data

The development of a legal framework for the reporting of non-financial information in the Slovak Republic and Czech Republic as the EU Member States is in line with EU requirements and a legislative framework applicable in the European Union. The purpose of this paper is the theoretical comparison of the disclosure requirements of the non-financial information set out in the legal acts of these two countries had long common political and social history 25 years ago.

In this paper we analyse separately the provisions of the laws relating to the mainly problems in this topic, specifically entities reporting non-financial information, reporting form, nature and content of information, audit of this information. The results of this comparison are present by tables for more clear form of presentations. The comparative analysis of data from Act No. 431/2002 Coll. on accounting as amended in Slovakia and Act No. 563/1991 Coll. on accounting as amended in the Czechia was carried out by context analysis.

4   Empirical results

Reporting of financial and non-financial information in the both countries is set out in the legal norms for accounting. In the Slovak Republic is for comparison relevant Act No. 431/2002 Coll. on accounting, as amended and in the Czech Republic Act No. 563/1991 Coll. on accounting, as amended and effective of January 1, 2018. The topicality of such comparison stems from the fact that many Slovak companies or groups operate in neighbouring countries or other EU countries, or on the contrary, from the capital participation of foreign corporations. At first we do research in concretization of the entities in the Czech Republic and the Slovak Republic obligatory reporting non-financial information

4.1   The provisions relating to concretization of the entities reporting the non-financial information

The third section of the Act No. 431/2002 Coll. on accounting as amended in Slovakia, article 20 "Annual Report" deals with mandatory information it contains and disclosing of information in the Annual Report and other reports due to social responsibility of these accounting units. As of January 1, 2017 all provisions of the Act on accounting dealing with disclosing of the non-financial information are effective. In Czech Republic there is for comparison a corresponding part eight of the Act No. 563/1991 Coll. on accounting as amended with name disclosure of the non-financial information. This year's change of reporting is a highly important topic in the both countries, because some of the provisions are being applied for the first time. The Table 1 contains the specifications of entities reporting the non-financial information in the both countries.

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Table 1. Entities reporting the non-financial information

Act No. 563/1991 Coll. on Accounting as amended (CZ)	Act No. 431/2002 Coll. on Accounting, as amended (SK)
PART EIGHT – DISCLOSURE OF NON-FINANCIAL INFORMATION	PART THREE – FINANCIAL STATEMENTS Article 20 – ANNUAL REPORT
An entity reporting the non-financial information is understood a) a large entity that is a trading company and is also a public-interest entity if, at the balance sheet date, it exceeds the 500-earning average of the average of the number of employees during the accounting period, b) a consolidating entity of a large group of entities that is also a public interest entity if, at the balance sheet date, exceeds the 500 average number of employees during the accounting period on a consolidated basis.	A public-interest entity, with the exception of an accounting unit the National Bank of Slovakia with the average calculated number of employees for the accounting period exceeding 500 employees, will also provide in its annual report the non-financial information regarding the development, performance, position and effect of the accounting unit activity on the environmental, social and employment issues, information regarding the respecting of human rights and information concerning the fight against bribery and corruption (hereinafter referred to as the "social responsibility area").
An entity with a registered office in the Czech Republic is considered to be **a public interest entity** a) An entity that is a trading company and is an issuer of investment securities admitted to trading on a European regulated market shall apply international accounting standards governed by European Union law for the purpose of accounting and preparation of the financial statements. b) by a bank governed by the law regulating the activities of banks or by a savings and credit cooperative under the law governing the activities of credit unions and credit unions, c) an insurance or reinsurance undertaking under the law governing the business of insurance and reinsurance undertakings, d) a pension company under the law governing pension savings or supplementary pension savings, or e) the sickness insurance fund.	a **public interest entity** is considered an accounting unit that has issued securities admitted to trading on a regulated market in any Member State of the European Union ("Member State"), bank, branch of a foreign bank, the Export-Import Bank of the Slovak Republic, insurance company, a branch office of a foreign insurance company, reinsurance company, a branch office of a foreign reinsurance company, health insurance company, asset management company, a branch office of a foreign asset management company, pension asset management company, supplementary pension asset management company, stock exchange, central securities depository, securities trader, payment institution, electronic money institution, collective investment entity, pension fund, a branch office of a foreign financial institution and an following accounting unit:
It is always considered a large entity a) a public-interest entity, b) the selected entity. A large accounting entity (and a large group of entities is the entity that consists of a consolidating entity and consolidated entity and which, on a consolidated basis) is that which at the balance sheet date exceeds at least two thresholds a) assets total CZK 500,000,000, b) annual total net turnover of CZK 1,000,000,000, c) the average number of employees during the accounting year is 250.	an accounting entity is a company that has met, in at least two successive accounting periods, no fewer than two of the following requirements: a) its total assets exceeded EUR 170,000,000; while total assets being defined as total assets ascertained from the balance sheet before adjustments, b) its net turnover exceeded EUR 170,000,000, c) the average calculated number of employees exceeded 2,000 in a particular accounting period.

Source: Own processing according to the Act No. 563/1991 Coll. on Accounting as amended and Act No. 431/2002 Coll. on Accounting as amended.

Disparities in the both counties what we have found out in the relevant legal acts of the Czech Republic and the Slovak Republic are in a specification of companies and a concretization of reported

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information. In the Slovak Republic, criteria for public interest entities, with the exception of security papers issuers and financial institutions, are set out on a very high level, i.e. on total property value and net turnover up to EUR 170,000,000 and on an average calculated employee number in a single accounting period up to 2,000, with the fulfilment of at least two criteria required during two consecutive periods. Except for a public interest entities in the Czech Republic as a security papers issuers and financial institutions, there are no other companies that have to disclosure the non-financial information.

4.2 Nature and form of reported non-financial information

In Table 2 we compare the form and nature of analysed expected reported non-financial information in the Czech and Slovak Republic according to the applicable laws, which are Act No. 563/1991 Coll. on Accounting as amended in Czechia and Act No. 431/2002 Coll. on Accounting, as amended in Slovakia.

Table 2. Report form and information nature

Act No. 563/1991 Coll. on Accounting as amended (CZ)	Act No. 431/2002 Coll. on Accounting, as amended (SK)
Report form and information nature	*Report form and information nature*
Non-financial information is provided by an entity reporting the non-financial information in the **annual report** or in the **consolidated annual report** or in a **separate report**. An entity that discloses the non-financial information may use the disclosure methodologies that govern the disclosure of corporate social responsibility reporting and, if it does so, is required to indicate which methodologies it has based on. An entity disclosing non-financial information discloses non-financial information to the extent necessary to understand the entity's or group's performance, its performance and its position and its impact, and non-financial information regarding at least the issues a) the environment, b) social and employment, c) respect for human rights and d) the fight against corruption and bribery.	A public-interest entity, with the exception of an accounting unit according to act on accounting, will also provide in its **annual report** non-financial information regarding the development, performance, position and effect of the accounting unit activity on the environmental, social and employment issues, information regarding the respecting of human rights and information concerning the fight against bribery and corruption (hereinafter referred to as the "social responsibility area").
The content of the information	*The content of the information*
The non-financial information shall be structured as follows: a) a brief description of an entity's business model stating non-financial information or groups, b) a description of the arrangements applied by the reporting entity or the group in relation to these matters, including the due diligence procedures applied; if no action is taken on one of these issues, a justification shall be given on why the measure does not apply in the matter, c) a description of the results of these measures, d) a description of the main risks associated with those matters associated with the business of an entity reporting non-financial information or groups, including, where appropriate and where appropriate,	It will provide at least a) a brief description of the business model; b) a description and the results of the policy applied by the accounting unit in the social responsibility area; c) a description of the main risks related to the accounting unit impact on the social responsibility area, which ensue from the accounting unit activity that could have adverse consequences, and when appropriate, also a description of the business relations, products or services provided by the accounting unit and a description of the way in which the accounting unit manages the above risks;

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its business relationships, products or services; could have adverse effects in those areas, and the manner in which that entity controls the non-financial information or group, e) non-financial key performance indicators relevant to the business activity concerned.	d) significant non-financial information regarding the accounting unit activity according to the individual activities; e) a reference to the sums shown in the financial statements and an explanation of such sums as regards their impact on the social responsibility area, if appropriate.
Connection with financial information	*Connection with financial information*
Non-financial information includes, if possible and expedient, references to the amounts reported in the financial statements or in the consolidated financial statements with any further detailed commentary.	It will provide a reference to the sums shown in the financial statements and an explanation of such sums as regards their impact on the social responsibility area, if appropriate.
Audit of non-financial information	*Audit of non-financial information*
The auditor will verify whether an entity reporting the non-financial information has produced the non-financial information and reported it in the annual report or consolidated annual report or whether it has prepared a separate report.	The annual report of the accounting unit according this act must provide a true and fair view and must be verify by an auditor within one year from the termination of the accounting period. The auditor must in the context of non-financial information reporting - provide its opinion regarding compliance of the annual report with the financial statements, with the exception of the annual report according to a special regulation; - provide its opinion whether the annual report comprises information according to the Act on Accounting; - specify whether any significant misstatement was found in the annual report based on the findings obtained about the accounting unit and specify the character of each misstatement ascertained

Source: Own processing according to the Act No. 563/1991 Coll. on Accounting as amended and Act No. 431/2002 Coll. on Accounting as amended.

Non-financial information is provided by an entity reporting the non-financial information in Czechia in the annual report or in the consolidated annual report or in a separate report and in Slovakia as part of the individual annual report or consolidated report. In Czechia it is determined how the non-financial information is to be structured, in Slovakia it is not. In both of the countries there is a required connectivity of the non-financial information with the financial statements. Audit of this information is more concrete in Slovakia with the duty to specify whether any significant misstatement was founded in the annual report based on the findings obtained about the accounting unit and specify the character of each misstatement ascertained.

5   Conclusion

The basis for the sustainability of economic policy is the application of social responsibility by states and companies as well, which has a huge impact on the societal, economic and social aspects of companies working in society. These aspects cannot be described only by the financial form but they are more of a non-financial character.

In the present there are many international frameworks regulating disclosing of the non-financial information, however they are all based on optionality, such as GRI Global Reporting Initiative, EMAS (Eco-Management and Audit Scheme); Global Compact UN initiative, main principles for entrepreneurship and human rights for implementing UN framework "protect, respect and remedy"; OECD Guideline for transnational corporations; ISO Standard 26000; ILO trilateral statement on the

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principles for transnational corporations and social policy. Despite efforts to globally unify the starting points of non-financial reporting standardisation, the degree of standardisation and law enforcement remains low and formally insufficient. It still does not have the level of financial information reporting standardisation.

Legal provisions of EU countries included a full-scale non-financial information reporting provisions only when required by Directive 2013/34/EU as amended by Directive 2014/95/EU amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups.

The Slovak Republic and Czech Republic as the EU Member States have the legal framework for reporting the non-financial information in line with EU requirements and a legislative framework applicable in the European Union.

Disparities in the both countries we have found out in the relevant legal acts of the Czech Republic and the Slovak Republic are in a specification of companies and a concretization of reported information. An entity reporting the non-financial information in Slovakia and Czechia is a public-interest entity with the average calculated number of employees for the accounting period exceeding 500 employees. In the Slovak Republic, criteria for public interest entities, with the exception of security papers issuers and financial institutions, are set out on a very high level, i.e. on total property value and net turnover up to EUR 170,000,000 and on an average calculated employee number in a single accounting period up to 2,000, with the fulfilment of at least two criteria required during two consecutive periods. On the other hand, except for a public interest entity in the Czech Republic as a security papers issuers and financial institutions, there are no other companies have to disclosure non-financial information.

Non-financial information are provided by an entity reporting non-financial information in Czechia in the annual report or in the consolidated annual report or in a separate report and in Slovakia as part of the annual individual or consolidated report. In Czechia it is determined how the non-financial information is to be structured, in Slovakia it is not. In the both countries there is a required connectivity of the non-financial information with financial statements. Audit of this information is more concrete in Slovakia with the duty to specify whether any significant misstatement was founded in the annual report based on the findings obtained about the accounting unit and specify the character of each misstatement ascertained.

At the end, it can be assumed that disclosing not only financial but more non-financial information will remain a priority in the upcoming period in the European Union, Slovak Republic and Czech Republic as well.

However, no regulations on the implementation or reporting and disclosure of activities in line with the principles of sustainability can replace a subjective attitude of an entrepreneur towards making business, profit and future in general.

6   Acknowledgement

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THE RELATIONSHIP BETWEEN CO_2 EMISSIONS AND HUMAN HEALTH. AN ECONOMIC AND SOCIAL EVIDENCE FROM ROMANIA

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Abstract
The main objective of this study is to identify the impact that emissions of carbon dioxide (CO_2) have on the number of patients with respiratory disease in Romania. Another objective of the research is to highlight the socio-economic effects resulting from this phenomenon using evidence from Romania. We have chosen to run this test on Romania case study because it is a country that was under a communist regime for 45 years and then it has begun its long way towards democracy, market economy, and it had to adapt itself to new demands and standards imposed by the European Union. We demonstrated in this paper that there is a positive correlation between pollution – expressed in our case by tones of CO_2 released in the atmosphere – and the number of patients suffering from respiratory disease, and a negative correlation between the gross domestic product and the number of patients suffering from respiratory disease.

Keywords
Asthma, Breathing apparatus, CO_2, GDP, Pollution.

JEL classification
I10, Q53, C20

1 Introduction

Chronic respiratory diseases are the cause of 4% of deaths worldwide, which in absolute terms accounts for about 4 million people (Wang et. all,2016). In this paper, we seek to check if there is a direct link between the increasing number of persons suffering from respiratory diseases and the rising levels of air pollution. Once this link has been substantiated, we also want to highlight some of the resulting negative economic and social consequences thereof. It should be mentioned that our analysis focused mostly on Romania, making in some cases correlations with data recorded or phenomena encountered in other countries or the EU average.

Pollution can be defined as being the dumping of some materials and substances that can affect human health as well as the entire ecosystem in the natural environment. Pollution can be the result of volcanic eruptions or fires, but these have an insignificant contribution to the increase of greenhouse gases, as compared to the level of pollution resulting from human activities.

Holgate (Holgate, 2009) has made an analysis of the main definitions given to the notion of pollutions, of which we mention: The energy industry is represented, across the whole country, by thermic and electric energy producing units. Following these activities, important quantities of polluting emissions are released into the atmosphere (especially CO_2, SO_x, NOx and dust). Moreover, other elements of the natural surrounding are affected (i.e. soil, vegetation, and fauna)

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and large amounts of waste are being generated (The National Agency for Environmental Protection, 2013).

If at the European Union's level, Romania is ranked the penultimate position, followed only by Bulgaria, with regards to the level of dust particles in air, we should mention just the fact that in Bucharest alone, the level of dust particles is 40% higher than the maximum European permitted level (www.cleanair.ro). Also in Romania, the level of particles in the atmosphere has reached recently the value of 55 micrograms per square meter, the other European countries' average being 30 micrograms, and the maximum permitted level mentioned in the European Legislation is 40 micrograms per square meter.

The most dangerous form of pollution is industrial pollution, which can cause various diseases, ranging from simple allergies that can turn into bronchial asthma, infections or cancerous (malignant) tumours. The most exposed category is represented by children – they cannot avoid pollution, especially if they live in an urban area.

2   Literature survey

The first fossil fuel used on a large scale was coal, but it was introduced in industrial activities only in the 13th century in London. According to the documents, the climate went through a series of great changes, more exactly until the 17th century, it was in a cooling phase, a phenomenon that was later called The Little Ice Age. Thus, while the temperatures were getting lower and the climate colder and colder, the need for coal was stimulated, being more largely available than wood, which, up until the 13th century had represented the main heating source. The first negative effects of using this fossil fuel showed up recently after: a polluted air, slow breathing, and a considerable amount of ash in air, which laid on clothes, plants and buildings.

Another work, dating from 1733, which we consider to be of great interest belongs to John Arbuthnot in which the connection between urban pollution and the level of respiratory diseases is analysed. The conclusion of his work can be simplified as follows: the rate of sickness but more important, the rate of infant deaths among asthma-suffering people (asthma being one of the diseases that can appear due to atmospheric pollution) is greater in urban areas. As a solution to his issue, Arbuthnot suggested that all those children be moved out of the cities and into the countryside, where pollution is not as great (Holgate et al., 1999).

We continue the analysis on this issue with some concrete data offered by WHO (World Health Organization, 2018) according to which, in 2012 alone, atmospheric pollution was responsible for 3.7 million deaths, of which 88% were recorded in countries with low-to-average income. This number is worrying if we compare it to 2008, when the number of deaths due to atmospheric pollution was 1.3 million. In short, in only 4 years, the increase in pollution levels led to an increase of the mortality rate of 205.5%.

As we have shown in our short incursion on the relation between atmospheric pollution and the negative effects it has on human health, we believe there is a strong and direct link between the two elements. In the next part of our paper, we want to check through econometric tests if this is the case for Romania too; specifically, if the increase of pollution determines a series of serious consequences in this country. We have chosen to run this test not because the data presented above did not convince us regarding the negative effects of pollution in Romania, but because Romania underwent a series of political changes (the switch from a planned economy to a market economy), economic changes (the de-industrialization process, economic crisis, transition towards a market economy, etc.) and social changes.

3   Methodology and data

In order to investigate the relationship between the number of patients with respiratory disease (RESP), CO_2 emissions (CO_2) and the Gross Domestic Product (GDP) in Romania, we shall

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make use of a multiple regression. The study is based on the annual data provided by The National Institute of Statistics of Romania (INSSE) and The World Bank during the period 1992-2014. The multiple regression model proposed in studying the evolution of the number of patients suffering from respiratory disease, based on the CO_2 emission and GDP per capita, is:

$$Y_t = c(1) + c(2) \cdot LGDP_t + c(3) \cdot LCO2_t + \varepsilon_t \tag{1}$$

where:

Y_t is the number of patients suffering from respiratory disease (measured in number of patients)

LGDP is the gross domestic product (measured in euro per capita)

LCO2 is the carbon dioxide emissions (measured in metric tons per capita) and

ε is the error term.

All variables are used with their natural logarithms form in order to reduce heteroscedasticity.

Table 1. Descriptive statistics

Statistics / Unit	Variables		
	Respiratory disease	**CO₂ emissions**	**Gross Domestic Product**
	number of patients	metric tons per capita	euro per capita
	RESP	CO2	GDP
Minimum	5595562	3.42	4331.6
Maximum	8060179	5.70	9227.4
Mean	6993523	4.61	6486.2
Median	7080652	4.60	5986.5
Std. dev.	623819.3	0.65	1754.9
Skewness	-0.38	0.03	0.25
Kurtosis	2.51	2.14	1.41
Sample	1992-2014	1992-2014	1992-2014

Source: The data regarding respiratory disease were collected from INSSE, Tempo online (1992-2014). The data regarding CO₂ emissions and GDP per capita were collected from The World Bank (1992-2014).

4   Empirical results

In the case of a multiple regression model, the parameters can be estimated by using different methods. For determining the parameters of the model, we shall use the Least Squares Method. In order to test the validity of the hypothesis which the classic model is based on, various statistical tests will be used.

The solving of the equation (1) has been made with the help of the Eviews 9 software, and the results that we got at a sample level are presented in Figure 1.

According to the values of the coefficients presented in the figure above, we can affirm that the number of patients suffering from respiratory disease will decrease by 0.10 when GDP increases by one unit and increase by 0.23 when CO_2 increases by one unit in the given period of time. Thus, it can be noticed that in Romania, during the analyzed period, CO_2 has a greater impact on the number of patients suffering from respiratory disease compared to GDP. In order to determine the GDP's and CO_2 influence on the number of patients suffering from respiratory disease in Romania, in the total population starting from the multiple regression model, we will generalize the results of the coefficients estimated by applying the Student test. In choosing the

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correct hypothesis using the Student test, we shall compare t-statistic with t_{tab}=1.71 (for a significance level of α= 0.10 and T=23).

Dependent Variable: Y (LRESP)
Method: Least Squares
Sample: 1992 – 2014
Included observations: 23
LRESP=C(1)+C(2)*LGDP+C(3)*LCO2

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	16.29486	0.804657	20.25070	0.0000
C(2)	-0.103032	0.059717	-1.725331	0.0990
C(3)	0.238379	0.137791	1.730001	0.0973
R-squared	0.373051	Mean dependent var	15.75656	
Adjusted R-squared	0.310356	S.D. dependent var	0.091458	
F-statistic	5.950261	Durbin-Watson stat	1.006076	
Prob(F-statistic)	0.009383			

Fig. 1. Estimating the parameters of the regression model (Source: The authors' calculation based on data from the INSSE TEMPO-online and The World Bank).

Based on the results, we can conclude that the parameter c(2) is significantly different from 0, with a significance level α = 0.01, because t-statistic = 1.725331 > t_{tab} = 1.71, which means that the null hypothesis it rejected. This can also be seen through the probability associated with c(2) which is equal to p= 0.0990, so the parameter is significant in the total population. Also, in the case of c(3), we can notice that t-statistic = 1.730001 > t_{tab} = 1.71 and the probability associated to c(3) is close to 0, which confirms that the parameter is significant, resulting that it rejects the null hypothesis. Therefore, the results show that all the parameters are significantly different from zero.

In order to measure the intensity of the endogenous variables dependency to regression factors, the determination coefficient is established. Based on the results we obtained, at sample level, between the endogenous and exogenous variables, there is a medium correlation, because the Adjusted R-squared is equal to 0.310356 (Johnston, 1998, pp. 504-505). To study the size of Adjusted R-squared in the total population, the Fisher test is used (Theil, 1971, pp. 543-545). Because F-statistic = 5.95 > F_{tab} = 3.42, the null hypothesis is rejected, meaning that the influence of exogenous variables on the endogenous is significant.

In order to test the fundamental hypothesis referring to the random variable (ε) we will start with the independency of the residual ε_i variable value hypothesis. This hypothesis assumes the checking of the following relation (Stancu, 2011, p. 48):

$$\text{cov}(\varepsilon_i, \varepsilon_k) = E(\varepsilon_i, \varepsilon_k) = 0 \, (\forall) \, \text{i}, \text{k} = \overline{1, \text{T}}, i < k \tag{2}$$

In order to find out the autocorrelation between the residual values, a series of statistical procedures is used. For this study, we will use the Durbin Watson test. This is the most used test in residual variables autocorrelation analysis. To choose the correct hypothesis, the Durbin-Watson statistic is determined (Andrei et al, 2008, p. 126). The empirical value DW_{calc} =1.006 is compared to two theoretical values, d_1 and d_2, read from the Durbin-Watson Significance Table,

based on a significance level α, conveniently chosen (α = 0,05 or α = 0,01), by the number of exogenous variables k, and the observed values (T, T ≥ 15).

Working with a significant level of α=0.01, the number of exogenous variables being k=2 and the number of observations T=23, from the Durbin-Watson Significance Table, the following values are read: d_1 = 0.93 and d_2 = 1.29. Because d_1 = 0.93 < DW_{calc} = 1.006 < d_2=1.29, the errors are positively autocorrelated, the H_0 hypothesis is rejected, so the independence hypothesis of errors is not verified.

In order to eliminate the autocorrelation phenomenon, we used the Cochrane-Orcutt method, which states that estimating the first-order autocorrelation parameter of the errors (ρ parameter) and making a regression through quasi-difference in a model that has the next formulas (Andrei and Bourbonnais, 2008, p. 126):

$$Y_t = c(1) + c(2) X_{1t} + c(3) X_{2t} + \varepsilon_t \tag{3}$$

$$Y_{t-1} = c(1) + c(2) X_{1t-1} + c(3) X_{2t-1} + \varepsilon_{t-1} \tag{4}$$

The ρ coefficient is determined through direct regression of the residue on the delayed (t-1) value of it. Thus, the quasi-differential value is written as:

$$Y_t - \rho Y_{t-1} = c(1)(1-\rho) + c(2)(X_{1t} - \rho X_{1t-1}) + c(3)(X_{2t} - \rho X_{2t-1}) + u_t \tag{5}$$

Starting from the regression model that we estimated above, we re-estimated the value of the ρ parameter and the previous regression, until reaching the stability of the parameters. The ρ parameter is estimated using the smallest squares method, observing the hypothesis according to which the residues follow a self-regressive first order process:

$$\hat{\varepsilon}_t = \rho \hat{\varepsilon}_{t-1} + u_t \tag{6}$$

where u_t is a white noise and ρ ∈ R.

After the calculation, we have obtained the value of ρ as being equal to 0.49. Thus, based on the previous regression and the equation (6), corresponding to the ρ parameter estimated above, we have the following equation:

$$LRESP_t - \rho LRESP_{t-1} = c(1)(1-\rho) + c(2)*(LGDP_t - \rho LGDP_{t-1}) + c(2)*(LCO2_t - \rho LCO2_{t-1}) + u_t \tag{7}$$

We check the qualities of the new regression model by repeating the same steps as for the previous model (1), in order to Figure 2.

The results related to the two parameters of the new model show that the values of the Student statistics are greater in absolute value than the tabular value equal to 1.71 for a significance level of 10%. We can conclude that the null hypothesis is rejected for all parameters of the regression equation, these parameters being different from zero at the level of the entire population.

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Dependent Variable: L(RESP)-(0.49*(L(RESP(-1))))
Method: Least Squares
Sample (adjusted): 1993 – 2014
Included observations: 22 after adjustments
L(RESP)-(0.49*(L(RESP(-1))))=C(1)*(1-0.49)+C(2)*(L(GDP)-0.49
  (L(GDP(-1))))+C(3)(L(CO2)-0.49*(L(CO2(-1))))

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	17.06719	1.089046	15.67169	0.0000
C(2)	-0.192139	0.110466	-1.739348	0.0981
C(3)	0.249239	0.164319	1.516798	0.1458
R-squared	0.311801	Mean dependent var		8.032078
Adjusted R-squared	0.239359	S.D. dependent var		0.074434
F-statistic	4.304144	Durbin-Watson stat		1.723523
Prob(F-statistic)	0.028727			

Fig. 2. Estimating the parameters of the new model (7) (Source: The authors' calculation based on data from the INSSE TEMPO-online and The World Bank).

In order to measure the intensity of the relationship between the variables, the coefficient of determination is found. At the level of the sample, between the endogenous and exogenous variables, there is link of average intensity. In order to determine if this intensity remains the same at the level of total population, we used the Fisher test. Because F-statistic = 4.30 > F_{tab} = 3.44, it results that the null hypothesis is rejected and the only accepted true hypothesis is the alternative according to which there is a correlation between variables. The influence of the exogenous variables (GDP and CO_2) on the endogenous (RESP) ones is significant.

Table 2. Testing the basic hypotheses referring to the random u_t variable

Method: Least Squares LRESP - (0.49 * (LRESP(-1))) = C(1) * (1 - 0.49) + C(2) * (LGDP - 0.49 * (LGDP(-1))) + C(3) * (LCO2 - 0.49 * (LCO2(-1)))		
Independence of errors (Durbin Watson Test)	DW_{calc}	1.723523*
Homoscedasticity of errors (White Test)	F_{calc}	1.404520 (Prob=0.2506)
Normality of errors (Jarque Bera Test)	JB_{calc}	0.463259 (Prob=0.793240)

Working with a significance level of α= 0.01, the number of exogenous variables is k=2, and the number of observations is T=22, from the Durbin-Watson distribution table we find the following values: d_1 = 0.91 and d_2 = 1.28.

Source: Authors' estimates using Eviews

As to what the testing of the fundamental hypothesis referring to the random u_t variable (see Table 2) is concerned for the new model, we have reached the following conclusions:

- Durbin-Watson statistic is equal to 1.723523, so d_2 = 1.28 < DW_{calc}= 1.723523 < 4-d_2 = 2.72. We can conclude that the errors are independent and the error independence hypothesis checks.

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- in order to check the homoscedasticity hypothesis, we used the White test. Because the probability related to the Fisher test is higher than 5% (Prob. = 0.2506), the null hypothesis is accepted and the homoscedasticity hypothesis of the residual variable u_t is confirmed.
- in order to check the normality of errors hypothesis, we used the Jarque-Berra test, which is an asymptotic test, usable in the case of a large volume sample, which follows a chi-squared distribution with two degrees of freedom (Meşter, 2012: p.150). Because the related probability of accepting the null hypothesis as being true (Prob=0.793240) is higher than 5%, we can state that the normality of errors hypothesis cannot be rejected, the errors being normally distributed.

Therefore, we can affirm that there is a positive correlation between pollution – expressed in our case by tones of CO_2 released in the atmosphere – and the number of patients suffering from respiratory disease, and a negative correlation between the gross domestic product and the number of patients suffering from respiratory disease, as shown in the Table 3.

Table 3. Economic and social impact

1. Individuals experiencing respiratory problems may not perform various activities involving their contact with allergenic factors, or the number of working days will be reduced
2. The labour productivity of such individuals is lower
3. The costs with medication, hospitalization, medical check-ups performed by a specialist physician represent a heavy burden on families, especially on those with lower incomes
4. WHO statistical data shows that individuals most affected by higher levels of air pollution are children
5. Respiratory disorders are one of the leading causes of death worldwide among children

Source: Table drafted by the author based on information available online at
http://www.who.int/nmh/publications/fact_sheet_respiratory_en.pdf , last accessed on 02.07.2018

In order to highlight the economic aspects expressed in absolute values achieved in the case of Romania, our analysis started from the data presented by the European Lung White Book (www.erswhitebook.org), which presents both the direct and indirect costs of respiratory diseases. It should be specified that these tables are computed as an average at EU level (see Table 4).

Table 4. Direct and indirect costs resulting from respiratory disease

	Direct cost (Euro)	Indirect cost (euro)	Monetarised value of DAILYs lost (Euro)	Total Cost
COPB*	23.3	25.1	93	141.4
Asthma	19.5	14.4	38.3	72.2
Lung cancer	3.35	NA	103	106.4
Tuberculosis	0.54	-	5.37	5.9
OSAS	5.2	1.9	NA	7.1
Cystic fibrosis	0.6	NA	NA	0.6
Pneumonia	2.5	NA	43.5	46
Total	55	41.4	283.5	379.6

Note: COPD - Chronic obstructive pulmonary disease, OSAS - Obstructive sleep apnoea syndrome, NA - Not available, Direct cost = primary care, hospital outpatient and impatient acre, drugs, oxygen, Indirect cost = lost production including work absence and early retirement

Source: European Lung White Book.

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According to data published by the National Institute of Statistics, in 2016 alone, in Romania, 464,603 people were admitted in a hospital, involving costs amounting to EUR 41,382,189.26. For a more detailed analysis, see the table below in which we present the approximate respiratory disease related costs that Romania had to bear between 2013-2016 (see Table 5).

Table 5. The approximate costs incurred by Romania - Scenarios

	Patients no. (1)	Direct costs	Indirect costs (i.e. monetized costs of a working day)	Total
2013	529,751	43.05 (2) *529,751 = EUR 22,807,774.2	46.02 (3) *529,751 = EUR 24,379, 141.02	EUR 47,186,915.22
2014	502,906	43.05*502,906 = EUR 21,650,103.3	46.02*502,906 = EUR 23,143,734.12	EUR 44,793, 837.42
2015	501,956	43.05*501,956 = EUR 21,609,205.8	46.02*501,956 = EUR 23,100, 015,12	EUR 44,709,220.92
2016	464,603	43.05*464,603 = EUR 20,001,159.2	46.02*464,603 = EUR 21,381, 030.06	EUR 41,382,189.26

1. No. of discharged patients who suffered from respiratory disease, according to the National Institute of Statistics, data available online at: http://statistici.insse.ro/shop/ , last accessed on 20.07.2018.
2. Daily rate for inpatient care (hospitalisation) on the Pneumophysiology Dept. is RON 200.20, that is EUR 43.05 (calculated at the National Bank of Romania's official exchange rate on 20.07.2018) Source: http://www.cnas.ro/media/pageFiles/Norme%202012% 20-% 2029.12.2011.pdf
3. According to the National Statistics Institute of Romania, in April 2018 gross average earning was RON 4,494 per month. On average, we consider 21 working days per one month, which means that an employee has a gross average earning of RON 4494:21 = RON 214 / working day (or 214:4.65 = EUR 46.02, calculated at the date of 20.07.2018).

Source: Table drafted by the author

5   Conclusions

In this paper we started from the idea that there is a direct relation between the level of atmospheric pollution and the rate of the respiratory system diseases. We have proven, by using an econometric model, that this relation keeps its intensity even in a country that was under a communist regime for 45 years and then it began its long way towards a market economy, had to adapt to new demands and standards imposed by the European Union.

Once this connection has been proven, we consider that the simple fact that an ill population generates a series of economic and social implications, needs not to be overlooked. Besides, if we take into account the fact that one of the few annual targets of each country is achieving economic growth, a growth that means more resources are extracted and then processed, but also that more and more emissions are released into the atmosphere.

We need not to overlook about the data presented in this paper, regarding the number of people that have lost their lives due to various illness caused by the increase in air pollution, but especially the great rhythm this pollution has in affecting not only the health of people, but also all life on Earth.

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THE DEVELOPMENT OF FDI IN THE CZECH REPUBLIC SINCE THE EU ACCESS

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Abstract
This paper will explore the development of FDI over the period 2004-2017. The aim of this paper is to determine the flow of foreign direct investment into the Czech Republic and which countries are involved in the value of investments. It will also examine what foreign enterprises have been created by size and whether there has been a transformation in the sectors of the industry.It will also examine whether the growth in the number of foreign companies will lead to a rise in foreign direct investment. Based on the linear regression and correlation calculations, the dependence of the variables to be investigated should be proven or reversed. Foreign direct investment is an integral part of the development of the Czech economy, and its impact affects economic and political life in the country. A linear regression analysis has demonstrated the mutual relationship between FDI and foreign-controlled enterprises. The most important investors by country of origin are the Netherlands, Austria and Germany. Industry has been transformed and new industries have developed and some have been retreating. The growth of foreign firms had a linear trend throughout the reporting period.

1   Introduction

Foreign direct investment (FDI) can be described as one of the most important global phenomena of the contemporary world economy. In essence, they bring the individual locations into production systems of global transnational economic actors. Their impact is on the economic, social and political life of the countries in which they operate. They are very versatile, and they can trace both positive and negative elements. In any case, however, it can be said that further economic progress and development in less advanced countries is influenced by FDI. Adequate response to some of the negative aspects arising from their action is by no means isolation before them, but a clear framework and transparent rules for their action, not only at national but also at international level and as far as possible on a global level. The issue of foreign direct investment is often discussed at different levels. The subject of expert economic or political debates is to draw up the implications of foreign direct investment in the host country. From a general point of view in the literature, there is some consensus about the positive effects of FDI on the domestic economy.

Empirical analyses, however, confirm that this area of research is not easy. Some effects are difficult to quantify and do not produce conclusive results at the end of the study. Differences in the conclusions also reflect the availability and quality of the data, the length of time series, or the research method used. In order to establish links to global markets and support the inflow of foreign capital, the Ministry of Economy established the CzechInvest Business and Investment Support Agency. In conducting a research on the historical development of FDI, it is based on the definition of FDI set by the OECD (2008), which states that: Foreign direct investment reflects the intention of a resident of one economy (direct investor) to obtain a permanent shareholding in an entity residing in another than the investor's economy (direct investment). The first part is devoted to the theoretical definition of foreign direct investment. The second part deals with the methodology of work processing. The third part is devoted to analysing the development of individual variables from 2004 to 2017. The results will be presented in graphs and tables. The last part summarizes the partial results so far.

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The aim of this paper is to determine the flow of foreign direct investment into the Czech Republic and which countries are involved in the value of investments. It will also examine what foreign enterprises have been created by size and whether there has been a transformation in the sectors of the industry. Following the historical development, we have to find out how the growth of the number of foreign companies will lead to an increase in foreign direct investment. Based on the linear regression and correlation calculations, the dependence of the.

2   Literature review

Numerous studies of foreign trade are based on the key work of Markusen and Venables (1998). They explain foreign direct investment from the point of view of investor choice. However, the views of the various authors differ in how important the in-house business has gained in recent decades. For example, UNCTAD (2000) suggests that the production structures of companies pursuing "deep integration" strategies are increasingly important for FDI. Hanson (2008) also suggests that MNEs are increasingly vertically integrated. However, he finds that this often takes the form of subsequent distribution activities focused on domestic and other regional markets rather than actual production activity. Goldberg (1997) finds growing dependence on imported input products in almost all manufacturing industries in the United States, the United Kingdom and Canada. But it is interesting that not in Japan. Further evidence that a lot of foreign investment is more horizontal than vertical and the finding that foreign branch sales were higher in countries with higher tariffs and the cost of transport was dealt with by Brainard (1997). If there is a growing importance of imported inputs, it can be attributed to three mutually exclusive factors: outsourcing, increasing foreign direct investment for MNE development, and a global resource. According to the outsourcing hypothesis (Feenstra and Hanson, 1996), the increase in intermediate imports stems from companies' strategies to relocate some of their production abroad with relevant comparative advantages. For example, companies in the industrialized countries of the Czech Republic transfer labour intensive labour processes to labour-rich countries with lower wages, often requiring additional FDI in low-wage countries.

The Basic Taxonomy of FDI, as reported, for example, by Markusen (1998, p. 46) and used in the OECD and UNCTAD, is based on four areas: Control Rate (Minority and Foreign-Controlled Enterprises, Entry Theory, However, the Blomström and Kokko (1998) study suggests that the use of investment incentives to attract foreign firms may not be socially optimal, and the country is interesting for investors for reasons other than investment incentives, Tomšík (2004) claims that foreign direct investment they cannot be a separate goal, but they can be the most intermediate objective, but the real goal is to define it by default, for example, by means of growth of the economy or employment, and it is important to know the relation between FDI and macroeconomic developments. are not so positive, as some economists and economic policy makers have promised, and where the inflow of foreign direct investment is going to go, she described in detail Zamrazilová (2007). FDI has increased the investment potential of the Czech economy far above its own potential. They are likely to make a significant contribution to the economies potential. The economy generates demand-driven inflationary pressures, capacity constraints (labour market, infrastructure) are emerging of further economic growth. Economic policy needs an assessment of the benefits and costs of foreign direct investment, short-term and long-term. An important topic of today's world is risk assessment. Even in the case of FDI there are risks, their valuation is certainly not a trivial matter. Jahn (2008) considers foreign investment to be a definitely favourable factor that has significantly influenced the later economic development in the Czech Republic, contributed fundamentally to long-term high GDP growth, a rapid fall in unemployment, a recovery in foreign trade, and an increase in value added and labour productivity.

It also accelerates the adoption of standard managerial skills and practices of Czech companies and their managers and the introduction of corporate governance principles. In addition to statistically measurable impacts on the economy, FDI also had several other very positive effects.

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In the survey by Djankov and Hoekman (2000) the effect of FDI on domestic investment and the demonstration of the existence of direct and indirect technology transfer in the Czech Republic were made on the basis of company data. The research was carried out by panel regression for the period 1992-1996. Direct technology transfer and the effect of crowding out domestic investment were proven. Conversely, there has been no demonstration of the existence of an indirect technology transfer. Begg and McDowall (1987) provide an overview of several studies that directly or indirectly affect the impact of regional investment incentives on the investment behaviour of companies in supported regions of the United Kingdom. Banga (2003) examined the economic impact of host countries. For example, market size, labour costs, education, etc. It found that lower taxes attract FDI from developing countries but lower taxes do not attract FDI from developed countries. In addition, bilateral investment treaties (BITs) with developed countries appear to be strong and significant for the impact on FDI, while in the case of BIT with developing countries, the opposite is true.

Cleeve (2008) reported regressions and the results showed that foreign investors are attracting both government policies and tax holidays. Chalk (2001) concludes that incentives have different and contradictory effects on investor decision-making. In relation to developing countries, incentives may be of particular relevance to the export industry. Basic economic conditions such as infrastructure, general business, the environment, human resources, etc. are still important aspects for investors. The Harding and Javorcik study (2007) provided evidence of the diversion of FDI to other neighbouring countries due to investment incentives. Investment support leads to an increase in foreign direct investment inflows into developing countries. Revilla (2016) has come to the conclusion that infrastructure, income affects investor decision-making. It depends on the overall capacity of local companies to absorb foreign technology and new skills. It is necessary to strengthen the capacity of local companies to realize FDI revenues. The tax rate is negatively related to FDI.

3   Methodology and data

This section describes the methods that are used in this paper. Different methods are used for different parts of this work, but a holistic approach is used to ensure the consistency of the whole paper. In the first phase, a critical review of this topic is carried out and the given issue focusing on FDI and its impact on the business environment is presented and evaluated. Subsequently, the collection and analysis of available professional domestic and foreign literature was carried out.

In this work a comparative method is used to verify the achieved results or conclusions and more detailed formulations within the examined issues. The regression analysis determines the rate of entry of foreign companies into the Czech Republic. In this work we work with public annual data for the period 2004-2017. The beginning of the survey period was deliberately chosen in 2004, because this year the Czech Republic joined the European Union and it is a breakthrough year for the business environment. The core set of companies is that they meet the following conditions: their registered office in the Czech Republic and they are legal entities.

This paper refers to the definition of small and medium-sized enterprises according to the European Commission: Small enterprises (10 to 49 employees) with annual turnover or balance up to EUR 10 million, medium enterprises (50-249 employees) with an annual turnover of EUR 50 million or with a balance sheet total of up to EUR 43 million. All companies with over 250 employees and not covered by the above three categories are considered to be large enterprises. Legal entities under foreign control are examined under this paper. Published data are broken down by CZ-NACE branch structure.

The analysed data are obtained from the CSU database, Czech Invest and from the database of the Ministry of Industry and Trade. The obtained data is processed in Microsoft Office Excel and will be evaluated in the context of the specified methods. Different econometric models are used to determine the objectives set. Dependencies between the selected variables are evaluated and documented. Basic econometric models such as correlation and linear regression based on the formula number (1) are

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used to determine the results. It examines the influence of foreign-controlled firms (x) on foreign direct investment (s). Also, using correlation, the relationship between these variables is determined.

$$Y_i = \beta_0 + \beta_1 * x_i + e_i$$

(1)

β_0 = constant
B1 = regression coefficient
x… independently variable
e = residue.

Based on the data below in Table 1, a test of the dependence between the variables examined will be performed and the correlation and linear regression between FDI and foreign-controlled enterprises will be demonstrated or refuted. The enterprises under foreign control examined in this paper are a total of 61335 for the period 2004 to 2017.

Table 1. Input data to determine the relationship between FDI and foreign firms

year	FDI (mld. CZK)	Foreign companies	year	FDI (mld. CZK)	Foreign companies
2004	1 281	2534	2011	2 404	4766
2005	1 492	2707	2012	2 601	4732
2006	1 667	3092	2013	2 669	4260
2007	2 032	4630	2014	2 775	4727
2008	2 190	4772	2015	2 895	4651
2009	2 311	5481	2016	3 124	4371
2010	2 410	5807	2017	3320	4804

Source: own processing according to Czech Statistical Office (2017).

4   Empirical results

Foreign direct investment influences economic development in the Czech Republic. In the period of global economies it is an integral part of the development of the state's economy, which has implications for the economic, social and political life of the country. In this paper I deal with the development of FDI and foreign controlled enterprises between 2004 and 2016.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
PZI (mld.CZK)	1 281	1 492	1 667	2 032	2 190	2 311	2 410	2 404	2 601	2 669	2 775	2 895	3 124	3320
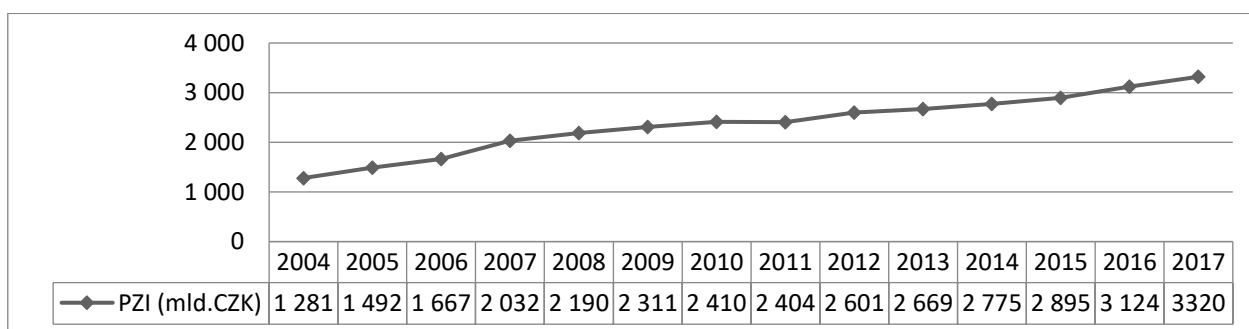
Fig. 1. FDI in 2004-2016 in mld. CZK (Source: own processing according to Czech Statistical Office, 2017)

Fig. 1 gives an overview of the state of foreign direct investment in the Czech Republic in 2004-2016. The FDI situation in the Czech Republic at the end of 2016 reached CZK 3,124.2 billion. In 2004, the structure of the FDI state for individual components changed in comparison with the end of 2016.

This development of changes is recorded for the entire period under review in the core capital component, an increase of CZK 768 billion. According to the analysis of the FDI over the period 2004-2016 it can be stated that FDI has been on the rise for the last thirteen years and this shows the

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growing interest of foreign investors to invest in the Czech Republic considerable funds. The state of foreign direct investment in the Czech Republic for the whole monitored period 2004-2016 was CZK 29849.2 billion. This amount includes equity and reinvested earnings and other capital. The largest share of foreign capital in the total volume of direct investment in the Czech Republic was allocated as follows: to the Manufacturing sector (31.6%), followed by Financial and insurance activities (27%) and Wholesale, retail and repair of motor vehicles (10.3%).

	1	2	3	4	5	6	7	8	9	10
FDI (mld.CZK)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Netherlands	550,7	691,9	684,1	713,24	658,75	754,26	763,25	665,90	697,74	731,06
Germany	422,7	315,3	316,6	332,52	358,23	364,13	301,56	349,60	373,48	440,51
Austria	229,6	264,9	279,7	310,84	317,35	335,52	373,62	366,25	387,96	343,66
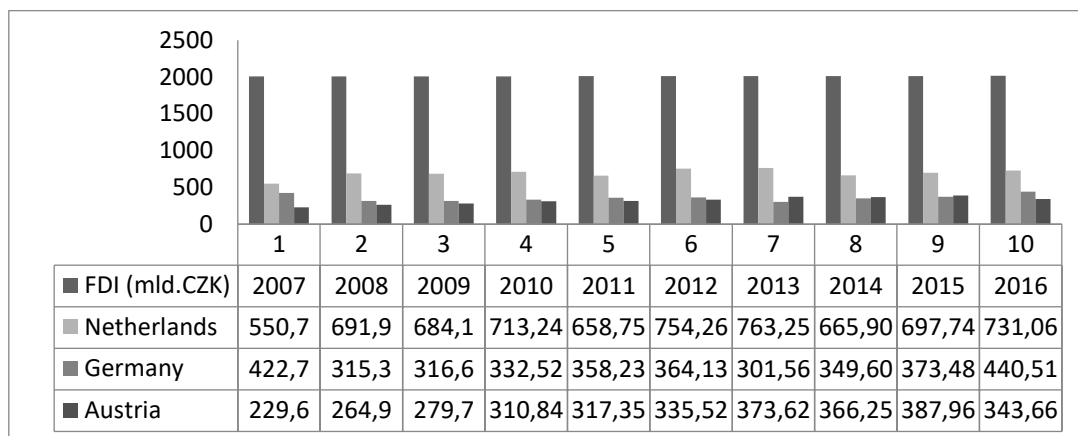
Fig. 2. FDI in 2004-2016 in mld. CZK (Source: own processing according to Czech Statistical Office, 2017)

From the geographical point of view, the four most important countries that have a share in the value of the FDI inflow to the CR are shown in Fig. 2. The amount of these investments by country is as follows. The Netherlands (NL) invested € 8197.7 billion. CZK, Germany (DE) worth 4482CZK, Austria (AT) 3703mld. CZK, Luxembourg (LU) 2197.2mld.CZK and other countries worth CZK 11,268.7mld. CZK. From a geographical point of view, the largest share of the capital invested in the Netherlands is the Netherlands with 23.4%, Germany with 14.1% and Austria with 11.1% share.
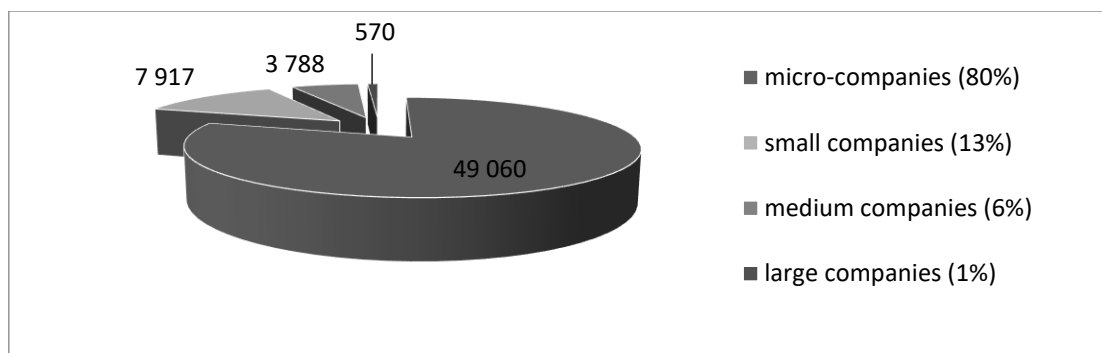
Fig. 3. International Company by number of employees 2004-2017 (Source: Czech Statistical Office, 2017)

According to Fig. 3 of the total number of 61335 foreign-controlled enterprises in the monitored period 2004 to 2017, micro-enterprises, according to the number of employees, formed 49060 enterprises, which is 80% of the total number of foreign enterprises. According to the number of employees, small businesses occupied 13% with 7917 enterprises, medium enterprises 6% with 3788 enterprises and large enterprises 570 enterprises, which is 1% of the total number of foreign controlled enterprises in the monitored period.

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Table 2. Developments in sectors 2004-2010 and 2011-2017

NACE Code	FDI in the CR - structure (in %)	2004-2010	2011-2017
K64	Financial and insurance activities	18.07	24.50
L68	Real estate activities	16.67	7.86
G45	Wholesale, retail, vehicle repairs	10.44	10.43
C29	Motor vehicles	6.20	0.00
D35	Production and distribution of electricity, gas	8.96	4.91
H49	Transport and Telecommunication)	6.01	0.37
J61	Processing of crude oil, chemical products	4.09	0.00
25	Metals, metal products	3.34	0.00
	Other	19.93	7.40
J58	Information and communication activities	0.93	5.53
M69	Professional, scientific and technical activities	0.70	4.74
L68	Private purchase and sale of real estate	0.00	1.40
C10	Manufacturing	4.27	32.11
B5	Heavy and Mining Minerals	0.39	0.74

Source: Czech Statistical Office (2017).

In Table 2, we can see a clear comparison, which is good, was lucrative for foreign investors. Since 2010 there has been some transformation between sectors. The number of companies in the manufacturing industry and financial and insurance services has increased. The manufacturing industry recorded the biggest changes in 2011-2017 compared to 2004 to 2010. Transformation between industries has not only been caused by the emergence of new enterprises with foreign participation but also by existing foreign companies that have increased their investments. And as a result of the expansion of the company, a lot of subcontractors and companies have been created which perform services or subcontractors for this company. For example, ŠKODA AUTO according to the country of origin from the Netherlands invested CZK 3888.75 million in 2010.
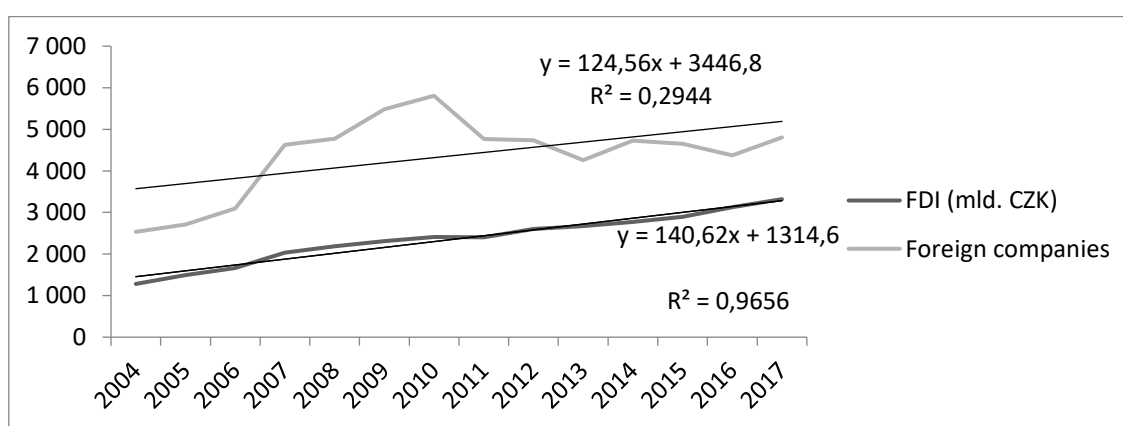
Fig. 4. Developments in FDI and foreign-controlled firms (Source: Czech Statistical Office, 2017)

Developments in FDI evolved between 2004 and 2017 with a linearly rising trend. There were no significant changes throughout the period under review as shown in Fig. 4. The quality of the regression model is given by the determination index R^2, which indicates how many percent of variance the explanation of the variable, is explained by the model and how much remained unspent. In Fig. 4, we see that R^2 for PZI explains that this model is 96% explicable and the value of the regression model for foreign firms is explained by 29%.

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It can be said that foreign direct investment has been on the rise for the last thirteen years and this is indicative of the growing interest of foreign investors to invest in the Czech Republic. When we compare the development of companies and FDI, we see that the emergence of foreign companies and has an alternating trend. In 2010 there was a large increase of foreign companies in the branch where foreign companies did not invest or invest less before this year. These were the following: information and communication activities, professional and scientific activities and the manufacturing industry.

A correlation coefficient is used to establish the link between FDI and the number of companies under foreign control, which is only a measure of the linear dependence of the results. Using this method, you can determine whether there is a positive, neutral or negative linear dependence of the variables listed below.

The correlation coefficient results are: correlation coefficient of 0.66 was found to be a statistically significant value at a significance level of 1% (0.0097) in the correlation between FDI and foreign-controlled enterprises. This means that if there is an increase in the number of companies under foreign control, the volume of FDI is likely to increase. The resulting linear regression relationship was confirmed at a level of statistical significance of 1%. The resulting equation y = 1858,693 + 1,064611x + residuals, points to the positive effect of the number of firms under foreign control on the volume of FDI. The regression coefficient is positive of 1.064611 and suggests that if there is an increase in the number of foreign firms, it will probably lead to FDI growth.

5   Conclusion

Foreign direct investment influences economic development in the Czech Republic. Based on the observed state of development of foreign direct investment and the number of foreign controlled enterprises, the objectives set could be achieved and the results analysed in the charts and tables. The aim was to find out the development of FDI flows to the Czech Republic for the period 2004-2017 and which most important countries contributed to the value of investments and which foreign enterprises. For the whole analysed period, foreign direct investment reached CZK 29,849.2 billion, which has a major impact on the economic development of the Czech Republic. The largest share of foreign capital in total direct investment was allocated to the manufacturing industry (31.6%), followed by Financial and insurance activities (27%) and Wholesale, retail and repair of motor vehicles (10.3%). From the geographical point of view, the most significant states that invested in the Czech Republic include the Netherlands, which invested 8197.7 billion CZK, Germany in the value of 4482 CZK, Austria 3703 mld. CZK and Luxembourg 2197.2 mld. CZK. Total enterprises under foreign control were 61335 in the period 2004 to 2017 in the Czech Republic.

In the monitored period, in terms of the number of employees, micro enterprises under foreign control took the largest share and formed 80%. The next ones were small businesses with 13%, medium enterprises with 6%, and large enterprises with 1% of the total number of foreign companies. In the Czech Republic there are many successful foreign investors in various sectors. The manufacturing industry recorded the biggest changes in the period 2011 to 2017 compared to 2004 to 2010. Transformation between sectors was not only due to the emergence of new enterprises with foreign participation but also to the impact of existing foreign companies that increased investment and expanded. As a result of the expansion of the company, a lot of subcontractors and companies that perform different services for this company have been created. For example, ŠKODA AUTO according to the country of origin from the Netherlands in 2010, invested CZK 3888.75 million in the expansion of operation. The research shows that in the individual years of FDI there is a linearly increasing trend of development between 2004 and 2017. The emergence of foreign enterprises has an alternating trend and in some years it fluctuates a lot. In 2010 there was a large increase of foreign companies in the branch where foreign companies did not invest or invest less before this year

These were the following: information and communication activities, professional and scientific activities and the manufacturing industry. Correlation between FDI and foreign-controlled enterprises

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has a positive correlation coefficient of 0.66 and is a statistically significant value at a 1% significance level (0.0097). The results show that if there is an increase in the number of companies under foreign control, the volume of FDI is likely to increase. Also, the linear regression relationship was confirmed at a level of statistical significance of 1%. The resulting equation points to the positive effect of the number of firms under foreign control on the volume of FDI. The regression coefficient suggests that if there is an increase in the number of foreign firms, it will probably lead to FDI growth. An analysis of the development of foreign direct investment and its influence on the Czech Republic raises interest in further information allowing a deeper analysis of the data. This topic will be dealt with in further scientific work.

6   Acknowledgement

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THREE DECADES OF THE EU COHESION POLICY: MAIN ACHIEVEMENTS AND FUTURE CHALLENGES

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Abstract
The main role in strengthening of cohesion and competitiveness of the European regions plays the EU Cohesion Policy. In June 2018, it was 30 years when the first EU Cohesion Policy regulations were adopted. Since that, all EU countries have benefited from the financial assistance of European funds in order to increase economic growth, employment and quality of life of European citizens. Thanks to the EU Cohesion Policy, the regional disparities decreased over the past decades, however a wide gap has still remained across EU regions. The first goal of the paper is to analyze the key milestone of the EU Cohesion Policy building and its importance for development of European countries and their regions. Furthermore, the paper deals with the actual issue of the post-2020 EU Cohesion Policy architecture in the context of new Multiannual Financial Framework and future European Integration challenges. The second goal of the paper is to evaluate the regional disparities and cohesion in the selected EU countries by quantitative approach.

Keywords
Achievements, Cluster analysis, Evaluation, EU Cohesion Policy, Regional disparities.

JEL classification
C10, C38, 018, R11, Y10

1   Introduction

The EU Cohesion Policy, built into the Treaties since 1986, has been given the objective of reducing the gap in the different regions' levels of development, supporting lagging regions to catch up with the rest of the EU members, encouraging the regions to join the internal market and promoting the stability of economic and monetary union, in order to strengthen economic and social cohesion. The Treaties of Maastricht[1], Amsterdam and Nice reaffirmed the policy's importance and its scope was even broadened by the Lisbon Treaty by a new, territorial dimension. European Councils in 1988, 1992, 1999 and 2005 confirmed the importance of Cohesion Policy by allocating increasing shares of the European budget to it (European Commission, 2008). Thanks to EU Cohesion Policy, the regional disparities decreased over the past decades, however a wide gap has still remained between the less developed (mostly regions in the "new countries") and the highly developed regions

The first goal of the paper is to analyze the key milestone of the EU Cohesion Policy building and its importance for development of European countries and their regions in the context of the main policy's achievements. Furthermore, the paper outlines the actual issue of the post-2020 EU Cohesion Policy architecture in the context of new Multiannual Financial Framework and future European Integration challenges. The second goal of the paper is to evaluate the regional disparities and cohesion in the selected EU countries by quantitative approach. The analysis and evaluation of regional disparities and cohesion is focused on the NUTS 2 regions of the EU-13 countries that joined the EU from the year 2004 to the year 2013. With their integration the strengthening of economic, social and territorial cohesion in the EU had to be reinforced. These countries have become one of the largest beneficiaries of the structural aid. To meet the goals of the paper the method of description, analysis-synthesis and cluster analysis as selected statistical multivariate methods are used.

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[1] The Treaty (1993) established a new instrument, the Cohesion Fund, and a new institution, the Committee of the Regions, as well as the introduction of the subsidiarity principle.

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2 Evolution of EU Cohesion Policy

The 30th anniversary of Cohesion Policy's implementation under the leadership of Jacques Delors is a one of its key milestone. Over three decades many achievements were reached: growth, jobs, faster internet, improved accessibility, more and better hospitals, childcare and schools for our children, etc. However, today's Cohesion Policy is very different to the one. Since then, 16 Member States have joined the Union and challenges and funding priorities have evolved. Policy has been continuously adapted while remaining faithful to the original principles: aid to the most disadvantaged regions, multiyear programming, strategically focused investments, and involvement of regional and local partners. Supporting the industrial transition of European regions is now becoming a major priority, as is support for migrant integration. (European Commission, 2018a)

Nowadays we can put the question: *is the policy still relevant today?* Overall, this policy can continue to serve the common European objective of shared peace, democracy, freedom, solidarity and prosperity. By European project, Cohesion Policy meets the principles set up in the preamble of the Treaty of Rome (1957). Moreover, Cohesion Policy is the primary European investment policy[2] and has supported investment during the financial and debt crisis. Current policy also requires major adjustments for the following reasons (European Commission, 2018a, p. 4): *economic* – Europe needs regions that are productive and radically transformed to ensure its sustainability; *social* – the strength of its social cohesion and the quality of its human capital will be strategic factors; *political* – there is a risk of continent wide social fragmentation.

2.1 Development of EU Cohesion Policy and main achievements

Cohesion Policy is central to European unity. Community policies to address economic and social imbalances have been in place since the Treaty of Rome, initially supported by around 4% of the EU budget[3]. (European Commission, 2018a) Following the accession of Greece in 1981, Portugal and Spain in 1986, regional disparities in the European Community widened significantly. The Single European Act and after that the year 1988 really marked the beginning of the EU Cohesion Policy: in March, the European Council decided to substantially increase the budget allocated to this policy[4], and in June, the Council adopted the first regulation integrating the Structural Funds[5] under Cohesion Policy umbrella[6]. This reform introduced key principles, such as focusing on the poorest and most backward regions, multi-annual programming, strategic orientation of investments, and the involvement of regional and local partners. The main beneficiary countries were Spain (Eur 14.2 billion), Italy (Eur 11.4 billion), Portugal (Eur 9.2 billion), Greece (Eur 8.2 billion). Structural Funds budget achieved Eur 69 billion (25 % of the EU budget). Increase in GDP represented plus 3% in less-developed regions and 600 000 new jobs were created in Greece, Ireland, Portugal and Spain. In December 1992, the European Council decided on the new financial perspective for the period 1994-1999 (so called Delors II Package) representing a doubling of annual resources (Eur 168 billion). In January 1995 Austria, Finland and Sweden joined the EU. It was created 700 000 jobs, 35 948 km of roads and motorways was constructed or upgrading and the aid of 800 000 SMEs was provided. The increase in GDP was also visible in the main beneficiaries, mainly in Portugal (+4.7%), New German

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[2] For example, from 2015 to 2017, the estimated percentage contribution of Cohesion Policy in public investment in Croatia was 80 %, which is very high compared to the EU-28 average of 8.5 %. (European Commission, 2018a)

[3] Until 1975 when the European Regional Development Fund was created, operations remained purely national, financing predetermined projects in the Member States with little European or subnational influence.

[4] In March 1988, the European Council agreed in Brussels on the first multi-annual Community budget for the years 1989-1993, called as the "Delors I Package".

[5] The European Social Fund (ESF) since 1958, the European Agriculture Guidance and Guarantee Fund (EAGGF) since 1962, and the European Regional Development Fund (ERDF).

[6] Administration of the Structural Funds between1989-1993 was governed by a set of five Council regulations providing for their effectiveness and coordination, their implementation and general provisions, and for the implementation of each of the three funds. While the coordination regulation was adopted on 24 June 1988, the Council decisions on the other four were taken on 19 December 1988. All of them entered into force on 1 January 1989. (European Commission, 2008)

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Lander (+ 3.9%), Ireland (+ 2.8%), Greece (+ 2.2%). For next period, EU Cohesion Policy 2000-2006 the amount of Eur 213 billion was allocated to 15 Member States and an additional Eur 22 billion for the new Member States for the period 2004-2006. Between the years 1995 and 2004, the regions with low GDP per capita achieved relatively strong economic growth and regions converged. The number of regions with GDP per capita below 75% fell from 78 to 70 and the number of those below 50% declined from 39 to 32 (European Commission, 2008, p. 3). On 1 May 2004, the accession of 10 new Member States to the EU was the key element in the period 2000-2006. This biggest enlargement brought a 20% increase in the EU's population, but only a 5% increase in its GDP. Almost all the new Member States were completely eligible for the highest level of support from EU Cohesion Policy. It was created 570 000 new jobs in less-developed regions including 160 000 in new Member States. Overall, in the period 2004-2007 the EU enjoyed a sustained period of economic growth, rising of income, employment rate and diminishing of poverty and social exclusion and regional disparities were shrinking. Prior to the crisis, disparities in GDP per head in the EU were shrinking. GDP per head in the less developed regions is converging towards the EU average through both faster productivity growth and increased employment. (European Commission, 2010a; European Commission, 2014; Minarčíková, 2015a; Minarčíková, 2016a).

Apart from the EU enlargement (Bulgaria, Romania and Croatia) the 2007-2013 period of Cohesion Policy was marked by three key and complementary elements: the inclusion of all regions, the highest concentration ever on the poorest Member States and regions (81.5% of the total budget), and a shift in priorities set to boost growth and jobs (25% of resources were earmarked for research and innovation). EU funding for financial instruments has increased considerably, rising from Eur1 billion in 2000-2006 to Eur 11.5 billion allocated in 2007-2013. Financial instruments played a crucial role in providing funding to SMEs during the credit crunch of the economic crisis. The total budget for the period 2007-2013 was Eur 347 billion (35.7% of the EU budget and 0.38% of the total EU GDP). The main beneficiary "old" countries were Spain (Eur 35.2 billion), Italy (Eur 28.8 billion), Portugal (Eur 21.5 billion), Greece (Eur 20.4 billion) and the new countries Czech Republic (Eur 26.7 billion), Germany (Eur 26.3 billion), Poland (Eur 67.3 billion) and Hungary (Eur 25.3 billion). As main achievements can be mentioned: creation of 1 million jobs, 6 million people were connected to new or improved supplies of clean drinking water, cross-border programmes resulted in over 6 800 projects and 400 000 SMEs with direct investment aid and 121 400 start-ups were financially supported. Cohesion Policy in the period 2007-2013 made a substantial contribution to growth and jobs. It was estimated to have increased GDP by 2.1% a year on average in Latvia, 1.8% a year in Lithuania and 1.7% a year in Poland in relation to what it would have been without the investment it has funded. It was also estimated to have increased the level of employment, by 1% a year in Poland, 0.6% in Hungary, and 0.4% in Slovakia and Lithuania. The estimates of the longer-term effects are larger because of the impact on the development potential of economies. In both Lithuania and Poland, GDP in 2020 is estimated to be over 4% above what it would be without the investment concerned and in Latvia, 5% higher. (European Commission, 2018a, European Commission, 2014) However, the positive tendencies in the narrowing of regional disparities have stopped since the economic and debt crisis hit the EU states. The crisis has had a major impact on regions and cities across the EU. The public debt, unemployment rate and poverty and social exclusion have rapidly increased in most of parts of the EU. Analysis of regional disparities according to changes in GDP per capita between 2000 and 2011 confirms that, in the long run, convergence is mostly a result of the least developed regions catching up rather than growth declining in the more developed ones (European Commission, 2014). Between 2008 and 2015, all the regions in the EU-13 converged except Cyprus and Praha. The Baltic States who were hit hard by the crisis still converged. Greek regions experienced big reductions in their GDP per head relative to the EU average, more than reversing the convergence achieved between 2000 and 2008. Almost all Portuguese and Italian regions continued to diverge. Spain was also affected by the crisis and diverged, but not to the same extent as Greece. (European Commission, 2017)

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In the period 2014-2020 the focus is on four priority areas with high growth potential: research and innovation, SMEs, information and communication technologies, and the low-carbon economy. The reformed policy supports smart specialisation that allows the regions to target productive investments in their chosen sectors, thereby maximising their growth potential. Clear and measurable targets are required to define quantifiable results. Through thematic concentration, the European Structural and Investment Fund programmes have been strongly orientated towards supporting the Europe 2020 strategy. However, there is significant variation across the EU in the progress towards achieving Europe 2020 targets: less developed regions are the farthest behind and innovation remains spatially concentrated. (European Policies Research Centre, University of Strathclyde: Bachtler and Polverari, 2017) The budget for Cohesion Policy 2014-2020 is Eur 351 billion (34.3% of the EU budget) and main beneficiary countries are mostly "new" countries: Poland, Romania, Czech Republic, Hungary; the "old" beneficiaries remain Italy (Eur 32.8 billion), Spain (Eur 28.5 billion) and Portugal (Eur 21.4 billion). Expected outcomes for this period are e.g.: 14.5 million additional households will have broadband access, helping over 7.4 million unemployed people and 8.9 million people gain new qualifications; aid for 1.1 million SMEs. (European Commission, 2018a) In 2014, disparities in employment started to narrow, followed by disparities in GDP per head in 2015. There are signs that the long-run process of regional convergence, which was interrupted by the economic crisis, has resumed. The unemployment rate across the EU has fallen from a high of 10.9% in 2013 to 8.6% in 2016 and 7.7% in 2017, still above the 7% it was in 2008. In some countries, the rate is lower than in 2008, but in others it is still at least 5 percentage points higher. (European Commission, 2017)

2.2 EU Cohesion Policy after 2020 and future challenges

EU Cohesion Policy after 2020 must react on the new European Integration challenges as Brexit, migration, border control or defence, as well as insufficient level of research and innovation. These facts are also reflected in the new Multiannual Financial Framework (MFF) for the years 2021 to 2027 which is framed by the White Paper on the Future of Europe. MFF 2021-2027 was adopted by the European Commission (EC) on 2 May 2018 and provides allocations for Union of 27 Member States, in line with the United Kingdom's withdraw from the European Union with the assumption in the year 2019. The structure of the expenditure "headings" of the MFF reflects the proposal for a more streamlined and transparent budget, focused on clear policy priorities. The MFF is structured in seven headings with three sub-ceilings: on "Economic, social and territorial cohesion" in heading II, on "Market related expenditures and direct payments" in heading III and on "Administrative expenditure of the institutions" in heading VII. The EC proposes for the MFF 2021-2027 a ceiling for commitments of Eur 1 134.6 billion in constant prices of 2018 equal to 1.11% of EU GNI and a corresponding payment ceiling of EUR 1 104.8 billion in constant prices of 2018 equal to1.08% of EU GNI (European Commission, 2018b). An agreement on the next long-term budget should be reached in 2019.

Although the financial importance of EU Cohesion Policy (as well as Common Agricultural Policy) in the EU budget has been increasing since 2007, the Policy remains after the year 2020 the EU's main investment policy and one of its most concrete expressions of solidarity. For the period 2021-2027, the Commission proposes to modernise Cohesion Policy with following main features (European Commission, 2018c).

A focus on key investment priorities, where the EU is best placed to deliver: the bulk of ERDF and CF investments will go towards innovation, support to small businesses, digital technologies and industrial modernisation. It will also go to the shift towards a low-carbon, circular economy and the fight against climate change, delivering on the Paris Agreement.

A Cohesion Policy for all regions and a more tailored approach to regional development: 1. *Investing in all regions*: Regions still lagging behind in terms of growth or income – mostly located in the South and East of Europe – will keep benefiting from important EU support. Cohesion Policy

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will continue investing in all regions, including in richer Member States, to struggle to achieve industrial transition, fight unemployment and hold their own in a globalised economy. 2. *A tailored approach*: Cohesion Policy keeps 3 categories of regions: less-developed, transition and more developed regions. The GDP per capita remains the predominant criterion for allocating funds. In addition, new criteria aim at better reflecting the reality on the ground – youth unemployment, low education level, climate change and the reception and integration of migrants. 3. *Locally-led*: The 2021-2027 Cohesion Policy stands for a Europe that empowers, by supporting locally-led development strategies. Local, urban and territorial authorities will be more involved in the management of EU funds, while increased co-financing rates will improve ownership of EU funded projects in regions and cities.

Fewer, clearer, shorter rules and a more flexible framework: 1. *Simplifying access to funds*: Commission proposes to make the rules less complex in the next long-term EU budget, with less red tape and lighter control procedures for businesses and entrepreneurs benefiting from EU support. *2. A single rulebook*: One set of rules now cover 7 EU funds implemented in partnership with Member States which will make life easier for EU funds programme managers. It will also facilitate synergies, for example between Cohesion Policy funds and the Asylum and Migration Fund when it comes to the development of local integration strategies for migrants. The framework also allows for more efficient links with other funds from the EU budget toolbox; for example Member States can choose to transfer some of their Cohesion Policy resources to the InvestEU programme. *3. Adapting to needs*: The new framework also combines the stability necessary for long-term investment planning with the right level of flexibility in order to cope with unforeseen events. A mid-term review will determine if changes in the programmes are needed for the last 2 years of the funding period, and limited transfers of resources within EU funds programmes will be possible.

A strengthened link with the European Semester to improve the investment environment in *Europe*: Commission proposes to strengthen the link between Cohesion Policy and the European Semester, to create a growth and business-friendly environment in Europe, so that both EU and national investments can deliver their full potential. Stronger Cohesion Policy support to structural reforms will ensure full complementarity and coordination with the new, enhanced Reform Support Programme.

The Commission's proposal for the MMF sets out an amount of Eur 330 624 million (in 2018 prices) for economic, social and territorial cohesion for the period 2021-2027. For European Regional Development Fund is allocated Eur 200 629 million (European Commission, 2018d):

- Eur 190 752 million for Investment for jobs and growth,
- Eur 8 430 million for European territorial cooperation,
- Eur 1 447 million for Outermost regions and sparsely populated areas,
- Budget of Cohesion Fund amounts of Eur 41 349 million of which contribution to CEF Transport is Eur 10 000 million. European Social Fund+ provides Eur 88 646 million.[7]

Table 1 shows the allocations on the basis of the new criteria to individual 13 Member States for the period 2021-2027. For the "new" Member States is allocated the most of EU Cohesion Policy budget (Eur 197 billion from the total amount of Eur 373 billion in current prices). For Central and Eastern European countries, it is expected to decrease the allocation compared with the previous period, by countries such as the Czech Republic, Hungary, Lithuania, Estonia, Malta, Poland, Slovakia and Germany by over 20%. On the other hand, the surplus can be expected for the countries of southern Europe, with Greece, Romania and Bulgaria increasing by 8% in comparison with the 2014-2020 period.

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[7] This amount does not include the amount for health, employment and social innovation (Eur 1 042 million).

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Tab. 1. Indicative allocation by EU-13 Member State 2004-2027 (in million Eur)

Country	2004–2006 (in 2004 prices)	2007–2013 (in current prices)	2014–2020 (in current prices)	2021–2027 (in current prices)	Change from 2014–2020 period (%)
Czech Republic	2 621	26 692	21 983	20 116	-24
Estonia	695	3 456	3 590	3 285	-24
Cyprus	113	640	735	988	+2
Latvia	1 164	4 620	4 512	4 812	-13
Lithuania	1 537	6 885	6 823	6 359	-24
Hungary	3 207	25 307	21 906	20 248	-24
Malta	88	855	725	672	-24
Poland	12 809	67 284	77 567	72 724	-23
Slovenia	456	4 205	3 074	3 464	-9
Slovakia	1 757	11 588	13 991	13 305	-22
Bulgaria	*1 319	6 853	7 588	10 082	+8
Romania	*3 078	19 668	22 993	30 766	+8
Croatia	**326	**904	8 609	9 888	-6

Source: European Commission (2004); European Commission (2007a), Novota et al. (2009), European Commission (2011), European Commission (2015), European Commission (2018e), own processing (2018)

*Financial allocations under pre-accession assistance (PHARE, ISPA, SAPARD).
**Financial allocations under pre-accession assistance (CARDS, PHARE, ISPA, SAPARD, IPA). This amount does not include allocations for IPA Component II, Cross-border cooperation.

During the debate on the shape of the post-2020 Cohesion Policy stakeholders have identified a number of principal issues relating to the operation of the policy itself as well as its impact and relationship with other EU polices and with the wider goals and objectives of the Union. One issue debated is how Cohesion Policy can best contribute to the twin objectives of competitiveness and cohesion. Cohesion Policy makers have emphasised that there is increasing evidence for the effectiveness of Cohesion Policy, strengthened by the emphasis of the 2013 reforms on performance and results. Further, they highlight the contribution of Cohesion Policy to Europe 2020, economic governance and structural reforms through thematic concentration, macroeconomic conditionality and ex ante conditionalities. While Cohesion Policy is already making a substantial contribution to these policy fields – and could be active in any successor to Europe 2020, such as the Strategic Development Goals of Agenda 2030 – there are valid concerns as to whether this is the most efficient way for the EU to respond to new policy challenges. Cohesion Policy is already managing difficult policy tensions and, arguably, suffering from policy overload. (European Policies Research Centre, University of Strathclyde: Bachtler and Polverari, 2017; European Parliament, 2017). Finding the most efficient form of support is another important point of discussion: should it be grants, repayable assistance, financial instruments, or possibly a mix of all of these along with further thematic concentration? In addition, the way that cohesion policy addresses new or growing challenges such as migration has been raised. Simplification of the policy for beneficiaries, flexibility, the importance of achieving better governance, and the contribution of cohesion policy to the EU's economic governance are all widely debated. Other specific matters raised relate to the urban dimension in cohesion policy and the impact that the policy can have upon growth, jobs and innovation in sparsely populated areas, regions lagging behind and regions with special geographical characteristics. The departure of the United Kingdom from the EU will have a significant impact on the EU budget and especially on the financial envelope for Cohesion Policy. An early question for the Article 50 negotiations is the scale of EU budgetary liabilities accepted by the United Kingdom and its willingness to continue participating in some EU programmes. Finally, the white papers on the future of the EU also have repercussions for Cohesion Policy. (European Parliament, 2017) Despite the fact that the EU is one of the wealthiest parts of the world, it faces the problem of large internal inequalities. In terms of Gross domestic product per capita (in PPS, % of EU average, EU28=100), Luxembourg is more than five times richer than Bulgaria (year 2017). At the regional level, the

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difference is much bigger: the richest region is Inner London-West with 611% GDP per capita while the poorest region is Severozapaden in Bulgaria with 29% GDP per capita (year 2016). Further process of globalization can strengthen this situation. One of the most serious aspects is the augmentation of uneven social and economic development. It is caused by the different power and abilities of firms, individuals and subsequently localities, cities, regions and states to participate actively in globalization (Sucháček, 2011, p. 321).

3   Methodology and data

The most important condition for developing an effective cohesion (regional) policy is to realize the level of regional disparities and the actual level of regions' socio-economic development[8]. Therefore, the evaluation of inequalities and the regional development in the EU countries is actual and important topic, however the attitude of researchers towards the quantitative evaluation is not uniformed. Regional indicators are processed by different mathematical, statistical or econometric methods. Several groups of methods can be identified, where five can be considered as very useful: *univariate statistical methods* (e.g. mean, coefficient of variation, traffic light method); *multivariate statistical methods* (e.g. cluster analysis, factor analysis), see e.g. Campo et al. (2008), Poledníková and Lelková (2012), Staníčková, Melecký and Navrátil (2013), Klímová and Žítek (2015), Staníčková (2015); *multicriteria decision-making methods* (e.g. AHP, TOPSIS, VIKOR), see e.g. Ginevičius et al. (2004), Kashi and Franek (2014), Minarčíková (2015b); *composites indices*, see e.g. Saisana and Tarantola (2002), Viturka (2014), Poledníková and Melecký (2017); *spatial analysis*, see e.g. Smętkowski, Wójcik (2010), Melecký (2015); and *other methods* see Michálek (2012), Slavata (2017).

For purposes of this paper, regional disparities and regional development are evaluated on the level of NUTS 2 regions of EU-13 countries using the method of *cluster analysis*. Because of the comparison of the regional disparities development, the cluster analysis is carried out in the years 2004 (year of the biggest EU enlargement) and year 2016 (as the year when all indicators are available for each region of EU-13 countries). Cluster analysis is done through the statistical software PASW Statistics 25. The results are showed by the maps created by the ESRI ArcGIS.

3.1   Data description

Thirteen EU countries are divided into total of 58 NUTS 2 regions. Regional disparities are evaluated by the 15 selected indicators of the economic, social and territorial dimension, see Table 2. These indicators are the most frequently used indicators of the regional disparities monitored within Cohesion Reports published by the European Commission and available in the Eurostat database. In case of this paper, weights of regional indicators are equal (weight=1).

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[8] Cohesion can be expressed as a level of differences between countries, regions or groups that are politically and socially tolerable. In context of EU cohesion, three types of regional disparities can be distinguished: economic, social and territorial, see e.g. Minarčíková (2015b).

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Tab. 2: Selected indicators for disparities evaluation in V4 regions

Type of disparity	Indicator
Economic disparity	Gross domestic product per inhabitant (PPS/inhabitant)
	Gross fixed capital formation (mil. EUR)
	Total intramural R&D expenditure (% GDP)
	Patent applications to the European Patent Office (number/mil. inhabitant)
	Employment in technology and knowledge-intensive sectors (%)
Social disparity	Employment rate from 15 to 64 years (%)
	Employment rate of older workers from 55 to 64 years (%)
	Unemployment rate from 15 and more (%)
	Persons aged 30-34 with tertiary education attainment (%)
	Early leavers from education and training, persons aged 18-24 (%)
Territorial disparity	Density of railway (km/1000 km^2)
	Density of motorway (km/1000 km^2)
	Life expectancy at age less than 1 year (mean number of years)
	Infant mortality rate (%)
	Victims in road accidents (number/mil. inhabitant)

Source: European Commission (2007b), European Commission (2010b), Minarčíková (2015b), Eurostat (2018)

3.2 Cluster analysis

Cluster analysis represents one of the multivariate statistical methods for classifying objects into homogeneous clusters. The objects in each cluster are similar to each other in some characteristics and dissimilar to those in other clusters. There are several clustering procedures for forming the clusters. The most popular procedures represent the hierarchical methods that use dissimilarities such as *distances* between objects when forming the clusters (e.g. the Euclidean distances, the squared Euclidean distance the Manhattan metric, etc.) After the computation of the distance measure, the clustering algorithm has to be selected. There are several *agglomerative procedures* and they can be distinguished by the way in which they define the distance from a newly formed cluster to a certain object or to other clusters in the solution. The most popular agglomerative clustering procedures include: methods of single linkage, complete linkage, average linkage, centroid, Ward's. Next step of cluster analysis is the graphical representation of the distance at which clusters are combined (dendrogram) and the determination of the cluster solution (optimal number of clusters).

In this paper, the agglomerative clustering process is based on Ward's method, applying the squared Euclidean distance. Ward's method is selected because it is generally a very efficient method and uses an analysis of variance approach to evaluate the distances between clusters (Minarčíková, 2016b; Poledníková and Lelková; 2012, for more details see also Hair and Black et al., 2009).

4 Empirical results

Based on the Agglomeration Coefficients, the optimal solution and the best interpretation of data ensures *five clusters*. To precise interpretation of clusters' characteristics and comparison of regions' classification, the profile of each cluster based on the *mean value of the standardized indicators* was constructed.

Cluster 1 included Czech region CZ01 Prague, two Slovenian regions SI03 Vzhodna Slovenija and SI04 Zahodna Slovenija in the year 2004. Cluster 1 achieved the highest average values and best results in the 13 of 15 indicators. It was characterized by high economic output, high support of research and development and flexible labour market. The Cluster 1 achieved the lower value only by the indicators Gross fixed capital formation and Employment rate of older workers from 55 to 64 years. In the year 2016, the level of development of cluster was the same, but the membership of regions was changed. The region Prague remained as part of Cluster, however the level of

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development of two Slovenian regions decreased and "dropped" to Cluster 2. Contrary Slovak region converged more and became member of Cluster 1. *Cluster 1 can be seen as most developed.*

Cluster 2 included in the year 2004: one Bulgarian region BG41Yugozapaden, one Czech region CZ02 Central Bohemia, Baltic regions EE00 Eesti and LV00 Latvija, island CY00 Kypros and region of Croatia HR04 Kontinentalna Hrvatska, then regions with capital cities PL12 Mazowieckie in Poland, HU10 Közép-Magyarország in Hungary, RO32 Bucuresti-Ilfov in Romania and SK01 Bratislava Region in Slovakia. In the year 2016, region Bratislava Region moved to Cluster 1. New members of Cluster 2 in the year 2016 were also Czech region CZ06 Southeast and LT00 Lietuva. This Cluster was characterized by high values of the 10 of 15 indicators, especially in the economic and social dimension. In the year 2016, Cluster 2 was lagging behind the social indicators (Cluster showed the higher level of rate of unemployment and level early leavers from education and training in comparison with Cluster 1) and also the territorial indicators as density of railway and victims of road accidents. *Cluster 2 can be considered as developed.*

Cluster 3 consisted of 17 regions in the year 2004, mainly of Czech and Hungarian regions (CZ03 Southwest, CZ04 Northwest, CZ05 Northeast, CZ06 Southeast, CZ07 Central Moravia, CZ08 Moravian-Silesian, HU21Közép-Dunántúl, HU22, Nyugat-Dunántúl, HU23 Dél-Dunántúl, HU31 Észak-Magyarország, HU32 Észak-Alföld and HU33 Dél-Alföld). Members of Cluster 3 were also Polish region PL21 Malopolskie, Slovak region SK02 Western Slovakia, Croatian region HR03 Jadranska Hrvatska, MT00 Malta and LT00 Lietuva. In the year 2016, regions Southeast and Lietuva converged to the level of development of regions in the Cluster 2. On the other hand, regions Jadranska Hrvatska and Malopolskie recorded the decrease in the level of development and dropped to Cluster 4. In the year 2016, new member of the Cluster 3 was Central Bohemia (in the year 2014 member of Cluster 2). Cluster 3 achieved the average values of economic and social indicators in comparison with Cluster 1. In the year 2016, the regions of Cluster 3 had the biggest problems with the low level of indicators Gross fixed capital formation, People aged 30-34 with tertiary education attainment and high rate of Early leavers from education and training. On the other hand, the rate of unemployment and victims of road accidents were the second lowest as well as the density of railway was second highest. *Cluster 3 can be seen as average developed.*

Cluster 4 involved mostly Polish and Slovak regions in the year 2004. In the year 2016, both Croatian regions and Polish region Malopolskie decreased in the level of development and "dropped" from the Cluster 2 and 3 to the Cluster 4. Moreover, region Eastern Slovakia dropped from the Cluster 4 to the Cluster 5. In the year 2016, the Cluster 4 showed the second lowest level of Gross domestic product per inhabitant, Total intramural R&D expenditure and Patent applications to the European Patent Office and the lowest level of Employment in technology and knowledge-intensive sectors. Regions in the Cluster 4 had problems with the low level of employment of people aged 55 to 64 and high rate of unemployment. The limitation were also visible in the territorial dimension, especially the low density of motorway, high rate of victims of road accidents and high rate of infant mortality together with the lower level of life expectancy. On the other hand, in the indicators Early leavers from education and training, People aged 30-34 with tertiary education attainment, Gross fixed capital formation achieved better results than Cluster 3 and by the indicator density of railway achieved better value than Cluster 2. *Cluster 4 can be indicated as less developed.*

Cluster 5 consisted of five from six Bulgarian regions (BG31 Severozapaden, BG32 Severen tsentralen, BG33 Severoiztochen, BG34 Yugoiztochen, BG42 Yuzhen tsentralen) and of seven from eight Romanian regions (RO11 Nord-Vest, RO12 Centru, RO21 Nord-Est, RO22 Sud-Est, RO31 Sud-Muntenia, RO41Sud-Vest Oltenia, RO42 Vest). These regions remained members of Cluster 5 also in the year 2016, together with Slovak region Western Slovakia, Hungarian regions Dél-Dunántúl, Észak-Magyarország, Észak-Alföld and Malta that showed the lower level of regional development in comparison with the year 2014. *Cluster 5 can be considered as least developed.*
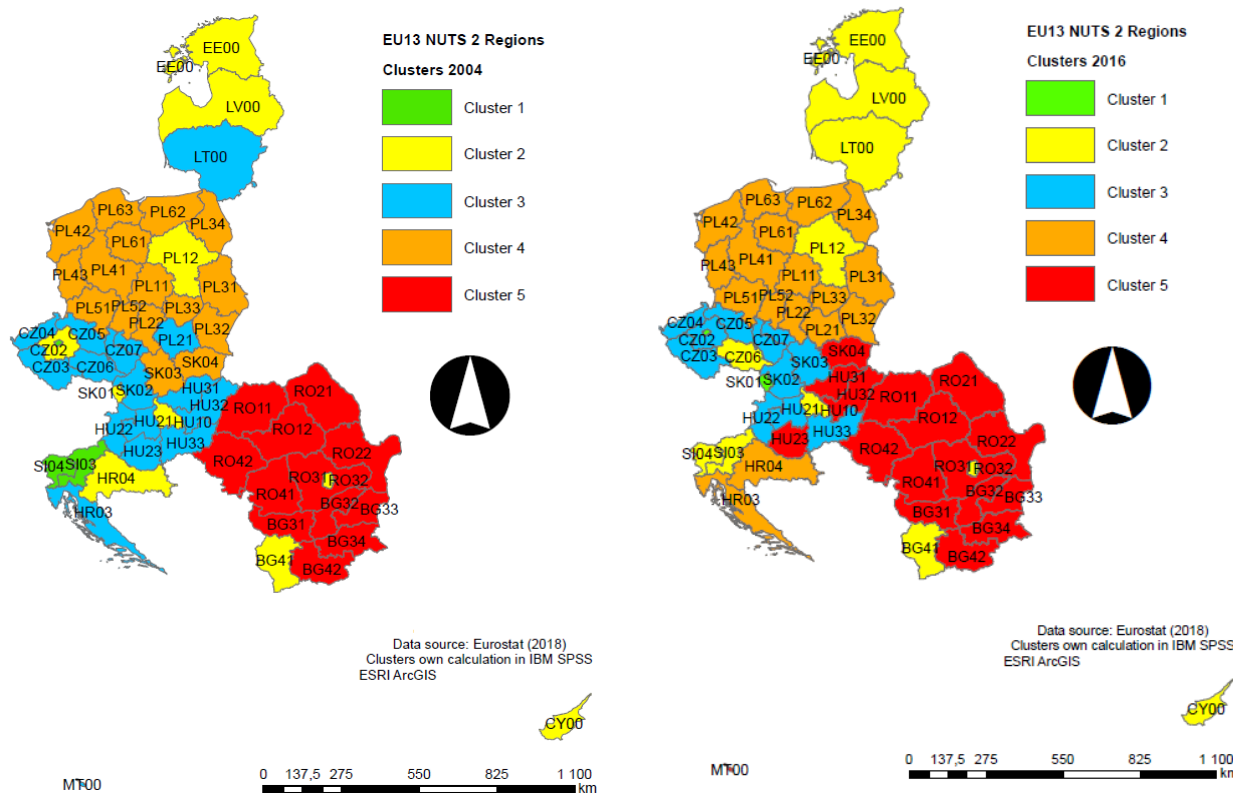
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Fig. 2. Classification of EU-13 regions by cluster analysis, years 2004 and 2016. (Source: own processing, 2018)

5   Conclusion

Since June 1988, when the Council regulation put existing EU funds into the context of economic and social cohesion, Cohesion Policy has become one of the most important and most debated EU policies. Cohesion Policy enables economic growth and sustainable development of European regions and it is considered the vital source of public investment. After year 2020 Cohesion Policy should remain the tool for reducing significant economic, social and territorial disparities and strengthening the global competitiveness of the European economy. Despite of EU Cohesion Policy's achievements, policy is under pressure to justify its added value in relation to EU political objectives because especially the "new" EU countries have still face the large internal inequalities that are a major obstacle to their balanced and harmonious development and thus whole EU.

The evaluation of regional disparities and development in the EU-13 countries showed that highest disparities existed between NUTS 2 regions in Cluster 1, Cluster 2 and Cluster 5. It confirmed the persisting disparities between regions with capital cities (Prague, Bratislava Region, Yugozapaden, Közép-Magyarország, Mazowieckie, Bucuresti-Ilfov or Zahodna Slovenija) and less developed regions in Bulgaria and Romania. Overall, it can be stated that from the year 2004 to the year 2016 some regions converged to the most developed regions and the level of cohesion was increased, as Southeast, Lietuva, Bratislava Region and Central Slovakia. Contrary, some regions declined in the level of development as Central Bohemia, Jadranska Hrvatska, Kontinentalna Hrvatska, Dél-Dunántúl, Észak-Magyarország, Észak-Alföld, Malta, Malopolskie Vzhodna Slovenija, Zahodna Slovenija and Eastern Slovakia. In these countries, the decrease in cohesion can be observed. By evaluation it is necessary take into account the limitation of NUTS 2 regional classification, which can cause the statistical misrepresentation of results. There is no one-size-fits-all recipe for regional development and regional policy implementation. However, principles such as partnership, transparency, subsidiarity and civil society participation combine to form an essential asset of

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development policies. After the decade of EU membership, the least developed regions have still faced to low level of gross fixed capital formation, expenditure on research and development, patent applications and employment in technology and knowledge-intensive sectors that weaken their competitiveness. In this sense, the support of Cohesion Policy through development programmes is still necessary as it was in 1988.

6   Acknowledgement

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WHO WILL TAKE CARE OF US?

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Abstract

Population ageing is exerting a direct effect on all EU countries. Population structures are changing significantly, and the demands placed on individual social systems are increasing. In the context of expert discussion, continuous attention is being devoted to issues surrounding long-term pension system sustainability and, in recent years, attention has also focused on social services and health care issues. The lessons learned so far have identified that the social services system is not prepared for the consequences of an ageing population. Many social service providers are already facing a shortage of social workers and in most regions waiting times for placement in residential facilities are increasing, field social services are not being further developed and the support provided by carers is insufficient. The aim of this paper is to attempt at least to provide an outline quantification of the expected increase in the need for skilled workers in the social services sector in order that these services will continue to be provided at a high quality level. Performed calculations show that by 2050, the number of workers in the social services sector would have to be approximately doubled, with the greatest personnel growth to be made by 2035.

Keywords

Care allowance, International comparison, Population ageing, Social services.

JEL classification

J11, J45, H43

1   Introduction

Projections of the population development of all European countries indicate that populations are ageing. In general, the total population is decreasing, the structure of the population is changing significantly, and the demands placed on respective social systems are increasing. With respect to the Czech Republic, the professional discourse has tended to focus principally on the issue of pension insurance, while the impacts of population ageing on the need for social services have been subjected to debate only over the last few years or so. Currently, however, it is clear that the social services system is not prepared for the consequences of population ageing. The dependence of providers on the granting of financial subsidies from the state budget is hindering the development of social services and low remuneration levels have resulted in the fact that many social service providers are suffering from a severe lack of social workers, which is being reflected in the prolongation of the waiting period for placement in residential facilities, a lack of development with regard to field social services and an insufficient level of state support for care providers.

The aim of this paper is to attempt to at least quantify the expected increase in the need for qualified personnel in the social services sector in order that high quality social services will continue to be provided in the Czech Republic going forward. To date, no attention has been devoted to this issue despite it being clear that a lack of social workers may well be a significant limiting factor with respect to the future development of social services.

2   Literature review

In 2013 the Projection of the Population of the Czech Republic to 2100 was published, thus allowing for the updating of the impacts that the anticipated development of the population will exert on, *inter alia*, the full range of social systems. While discussion on the impacts on the pension insurance system has been underway for many years and the quantification thereof is a question primarily of standard

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actuarial calculation, the impact of population ageing on social services has been considered only to a marginal extent (Průša, 2015a); no comprehensive study aimed at quantifying the impact of population ageing on the need for social services has yet been conducted in the Czech Republic.

Subsequently, a projection of the number of recipients of the care allowance up to 2030 (Průša, 2018a) was compiled, which indicated that in the coming years it would be necessary to devote increased attention to issues surrounding the organisation, financing and management of social services in the Czech Republic. A range of views on this theme can be found in the context of an international comparison of the basic principles of the financing of social services in selected European countries (Průša, 2018b). While marginal attention has been devoted to the macroeconomic impact of the increase in the need for social services (Langhamrová, Šimková, Sixta, 2018), the anticipated requirement for new skilled labour has not yet been quantified.

3   Methodology and data

The starting point for the quantification of the anticipated impacts of population ageing on the need for social care services consists of data from the Ministry of Labour and Social Affairs (MoLSA) information system on the structure of care allowance recipients broken down by gender, age and degree of dependence for December of each calendar year from 2011 to 2017 with the exception of 2013 for which, due to problems related to a change in the MoLSA information system administrator, the data has not yet been fully consolidated; thus, data from the nearest available date, February 2014, is used to substitute for that from December 2013. The expected development of the number of beneficiaries of the care allowance was worked out in two scenarios according to the methodology previously developed (Průša, 2018a).

The starting point for the quantification of the future provision of social services personnel consists of data obtained from the MoLSA information system on the applications of social services providers for the granting of subsidies for social services provision from the state budget in 2018 and which includes detailed information on the personnel requirements of all social services providers. This information is not specifically monitored in the context of official MoLSA statistics.

4   Empirical results

The quantification of the expected development of the number of workers in social services was based on data on the expected population growth according to population projections, on the expected development of the number of beneficiaries of the care allowance, on the expected model calculations of the capacity development of the most widespread social services for the elderly and on the relations of the clients per one worker in these services.

As at December 2017, a total of 354 682 persons were in receipt of the care allowance, of which 107 285 were classified as 1st degree of dependency care allowance recipients, 115 466 persons 2nd degree recipients, 83 295 persons 3rd degree recipients and 48 636 persons 4th degree recipients. Compared to December 2007, the number of recipients of this allowance had increased by more than 63 thousand persons accompanied by significant changes in the structure of recipients during this period:

- the proportion of 1st degree care allowance recipients decreased by more than 13 percentage points (from 43.4% in 2007 to 30.3% in 2017),
- the proportion of 2nd degree recipients was virtually unchanged (33.2% in 2007 and 32.6% in 2017)
- the proportion of 3rd degree recipients increased by 8 percentage points (from 15.5% in 2007 to 23.5% in 2017),
- and the proportion of 4th degree recipients increased by 5.9 percentage points (from 7.9% in 2007 to 13.7% in 2017).

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On the basis of previously verified calculation methodology (Průša, 2018a), the following two scenarios were determined with respect to the development of the number of care allowance recipients up to 2050:

- the static scenario which is based on the proportion of care allowance recipients according to gender, age and degree of dependence of the total population of the given gender and age group in 2017; this proportion is retained throughout the reference period up to 2050,
- the dynamic scenario which is based on changes in the proportion of care allowance recipients according to gender, age and degree of dependence of the total population of the given gender and age group between December 2011 and December 2017, with the average annual change in this proportion being projected at the same level for the whole of the reference period up to 2050 (this variant responds to the changes that occurred in the structure of care allowance recipients following a change to the conditions for the granting of the allowance and following the above-mentioned reduction in the number of 1st degree recipients; this method is therefore more credible than the static method).

On the basis of these calculation methods it can be expected that by 2050 the number of care allowance recipients will have increased from the current approximately 355 thousand persons to between 632 and 734 thousand persons.
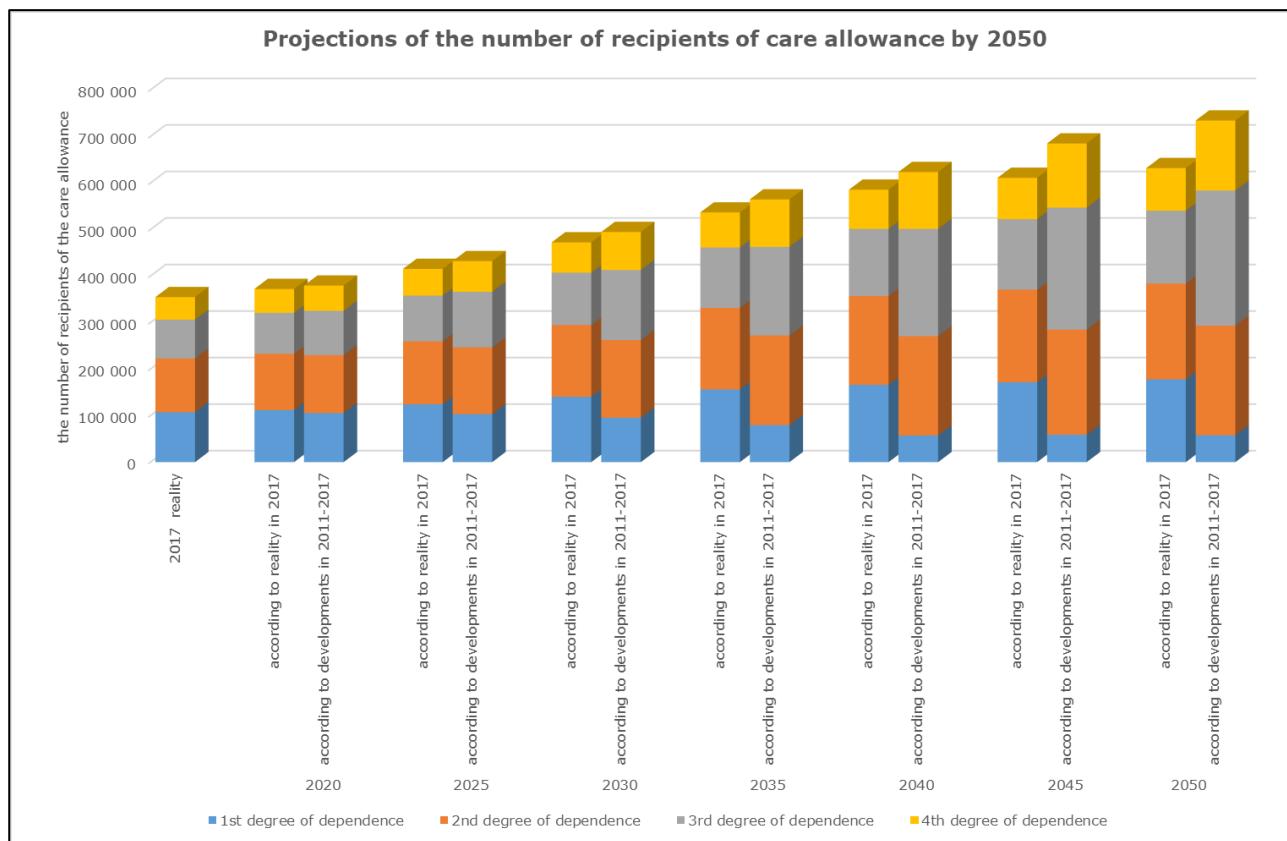
Fig. 1. Projection of the development of the number of care allowance recipients up to 2050 (Source: own calculations)

Based on applications from social services providers for the granting of subsidies for the provision of social services from the state budget in 2018, it was established that more than 80 000 persons worked in the social services sector in 2016, of which more than 70 000 persons worked in social care services.

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Table 1. Number and structure of persons working in individual social services in 2016

	number of workers	of which	share of workers in direct care of total number of workers	employment conditions of workers in direct care			
	total (recalculated number)	in direct care		employment contracts	agreement to perform work	agreement to complete a job	purchase of services
Day care	2 104.58	1 511.86	71.84	1 307.37	9.00	194.32	1.17
Day care centres	597.37	444.32	74.38	347.92	5.03	91.37	0.00
Homes for persons with health disabilities	10 925.28	7 835.57	71.72	7 311.53	54.60	453.75	15.69
Homes for the elderly	25 275.02	16 633.77	65.81	14 668.24	95.14	1 859.05	11.34
Special-purpose homes	12 409.98	8 858.06	71.38	8 045.94	34.60	762.08	15.44
Sheltered housing	2 366.52	2 011.23	84.99	1 700.91	28.58	279.07	2.67
Respite services	2 484.15	1 901.83	76.56	1 241.31	40.40	618.32	1.80
Personal assistance	3 805.96	3 566.30	93.70	1 611.54	169.11	1 766.19	19.46
Care services	8 293.64	6 872.61	82.87	5 544.75	73.17	1 248.29	6.40
Support for independent housing	140.14	130.61	93.20	108.84	0.35	21.39	0.03
Guidance and prediction services	57.22	39.22	68.54	22.90	1.30	15.02	0.00
Social services provided in health facilities	763.69	632.75	82.85	603.91	4.48	24.36	0.00
Emergency care	80.20	70.52	87.93	43.28	9.60	17.44	0.20
Weekly care	748.28	524.19	70.05	446.91	5.71	71.46	0.11
Total number of workers	70 052.02	51 032.82	72.85	43 005.35	531.06	7 422.10	74.31

Source: own calculations

Based on the above-mentioned anticipated development of the number of care allowance recipients of the various degrees of dependence, it is clear that the existing capacity of individual types of social services will not be sufficient in the future. It is also clear that the development of all forms of field, outpatient and residential facilities should form an integral part of development plans at both the municipal and regional levels. Increased emphasis on the analysis of the demographic development of the population at the regional level constitutes an essential prerequisite for responding in a timely manner to the changing demographic situation.

For orientation purposes, it should be noted that:

- the number of 1st degree dependence care allowance recipients indicates how many persons will most likely require care service assistance in their own homes, be it through registered social services providers, family members/close persons or combined care,
- the number of 2nd degree care allowance recipients indicates how many persons are likely to require more intensive care service assistance in their own homes, sheltered housing, day care centres or via day care services, be it through family members/close persons or combined care,
- the number of 3rd degree care allowance recipients indicates how many persons will require intensive, usually full-time comprehensive care in homes for the elderly, special-purpose homes, homes for persons with health disabilities or those in need of weekly care and, in extreme cases, those living in sheltered housing or their own homes; in such cases the provision of personal assistance services is necessary, and the required range of respite services must be made available,
- the number of 4th degree care allowance recipients indicates how many persons will require intensive comprehensive all-day care at residential social services facilities (homes for the

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elderly, homes for persons with health disabilities, special-purpose homes), health care facilities (hospital care for the long-term ill or so-called social beds provided by inpatient health care facilities); only to a minimal extent can it be expected that such persons could be provided with care in other types of facilities or in their own homes – clearly, in such cases most persons require personal assistance services, home health care, and the required range of respite services must be made available.

It is very difficult to specify the exact extent of the need for the provision of the various types of social services since it depends on the impacts of a number of factors that will determine the development thereof in individual regions. Thus, it will be necessary to closely analyse all the determinants that influence the behaviour of clients and potential clients with respect to individual types and forms of social services when preparing medium-term plans for the development of social services at both the municipal and regional levels (Průša, 2015).

A useful guide to the quantification of the expected development of the number of workers in the social care services sector is provided by legislation such as Slovak Act No. 448/2008 Coll., on Social Services, as amended which defines the number of users of social services per one client. According to this Act, for example, with respect to facilities for seniors with all-year residence, where more than 50% of clients have been classified as being of 4th to 6th degree of dependence, a maximum of 2 clients may be allocated to one employee, in the case of weekly care facilities, a maximum of 2.3 clients per employee and, concerning outpatient social services, a maximum of 3 clients per employee. At the same time, at least 52% of the total number of employees in all these types of facility must be professionally qualified personnel.

No similar legislation exists in the Czech Republic and the introduction thereof has not been discussed to date even by the professional public. The current phrasing of Decree No. 505/2006 Coll., according to which the service provider must adhere to a written structure and ensure that the number of job positions, job profiles, qualification and personal prerequisites of its employees, organisational structure and staff numbers are adequate for the type of social services provided as well as for the number and the needs of persons to whom it is provided appears to be too general and, for example, may well lead to a range of disputes in the context of social services inspections. Experience gained from the provision of services in clinics for the long-term ill shows that a shortage of workers may significantly reduce the quality of the services provided and jeopardise the fulfilment of the fundamental human rights of clients (Office of the Ombudsman, 2017).

The comparison of the number of workers in selected types of social care facilities with the capacity of these facilities, which was conducted via the analysis of applications from social services providers for the granting of subsidies from the state budget, revealed that the above conditions relating to Slovakia were fulfilled in the Czech Republic in 2016 and, moreover, are able to provide the starting point for at least a framework quantitative estimate of the number of qualified social workers required.

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Table 2. Number of workers relative to 1 place in residential social care facilities in 2016

	number of workers total (recalculated number)	number of beds in residential social care facilities	"normative" state budget number of beds per 1 employee	real situation number of beds per 1 employee
Day care	2 104.58	5 012	3.0	2.38
Homes for persons with health disabilities	10 925.28	11 381	2.3	1.04
Homes for the elderly	25 275.02	35 596	2.0	1.41
Special-purpose homes	12 409.98	15 387	2.3	1.24
Sheltered housing	2 366.52	5 493	2.5	2.32
Weekly care	748.28	822	2.3	1.10

Source: own calculations

When estimating the expected number of social workers that will be required in the future, it is necessary to consider both the anticipated development of the structures of the various forms of social services and the specific problems that can be identified in this area at the present time. Therefore, in this sense, it is necessary to take into account in particular the following facts:

- A comprehensive assessment of the availability of social care services conducted in 2015 (Průša, Bareš - Holub - Šlapák, 2015) confirmed that, from the quantitative viewpoint, there has been no significant change since 1995 in terms of the extent of care provided. The decline in the capacity of homes for the elderly compared with previous years can be attributed to the transformation of part of the capacity of such facilities into special-purpose homes.
- The current wording of the second sentence of Section 35 (2) of Act No. 128/2000 Coll., on municipalities, as amended, according to which "municipalities with extended powers, in accordance with local assumptions and habits, are required to ensure conditions in their local jurisdictions for the development of social care and the fulfilment of the needs of their citizens" represents a significant limiting factor in terms of supporting the development of social services in individual municipalities.
- Medium-term plans for the development of social services have, to date, failed to eliminate unjustified disparities with respect to the regional availability of such services. The main reason is that individual providers, by virtue of their dependence on subsidies provided by the state for which they have no absolute legal entitlement, tend, in principle, not to extend the supply of their services.
- While one of the objectives of the National Strategy for the Development of Social Services for the period 2016 to 2025 (MoLSA, 2015) is to compile and introduce a plan aimed at moving from institutional care to care in the community with the support of community-based field, outpatient and residential social services, the Strategy contains no reference to the quantification of the implementation of these aims.

The key issue, however, remains the expected development of the population and, in particular, the significant increase in the number of persons of post-productive age (Průša, 2015).

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Table 3. Development of the population and selected categories of seniors up to 2050 (medium variant)

| | | Population | | Share of older people | |
| | total | 65+ | 80+ | 65 years | 80 years |
				of the total population	
2020	10 532 373	2 156 103	455 637	20.47	4.33
2025	10 489 610	2 341 367	574 363	22.32	5.48
2030	10 396 701	2 483 876	767 242	23.89	7.38
2035	10 268 080	2 609 787	928 507	25.42	9.04
2040	10 126 418	2 819 163	996 211	27.84	9.84
2045	9 977 357	3 064 334	1 027 600	30.71	10.30
2050	9 812 872	3 158 657	1 070 432	32.19	10.91

Source: Czech Statistical Office, 2013.

It is clear that the increase in the number of persons of post-productive age will have to be reflected in a corresponding increase in the overall capacity of individual forms of social services for the elderly including that of residential facilities, despite the fact that currently available MoLSA conceptual materials continue to promote the thesis that the capacity of such services will not be increased and that care for seniors will be ensured by family members. In 2016:

- a total of 35 596 places were available in homes for the elderly, i.e. 83.28 places per 1 000 persons over the age of 80 years,
- a total of 15 387 places were available in special-purpose homes, i.e. 36.00 places per 1000 people over the age of 80 years,
- care services were provided by 63 701 persons, i.e. 31.22 carers per 1 000 people over the age of 65 years.

A comparison of these values with those concerning the same services abroad reveals that these types of social services are provided by substantially fewer persons in the Czech Republic than in other selected European countries (Bednárik – Bodnárová, 2005).

The three previously outlined model scenarios can be applied with concern to the characterisation of the estimated development of the structure of individual forms of social care services in the future, as based on:

- maintaining the current capacity of individual types of social care services throughout the reference period (model 1),
- maintaining the current level of the provision of individual types of social care services throughout the reference period (model 2),
- the projection of future changes in the structure of clients of individual types of social services (model 3) (Šídlová Kunstová, Šídlo, 2016).

Moreover, the above approaches can also be supplemented by a 4th model based on the so-called objectification of the structure of clients of individual types of social services according to the development of the rate of dependence thereof (Průša, 2015).

By maintaining the current capacity of individual types of social care services throughout the reference period up to 2050 according to model 1, for example:

- the number of places in homes for the elderly will fall from the current 83.28 places to 33.25 places per 1 000 persons over 80 years of age,
- the number of places in special-purpose homes will fall from the current 36.00 places to 14.37 places per 1 000 persons over 80 years of age,
- the provision of care services will decrease from the current 31.22 carers to 20.17 carers per 1 000 persons over 65 years of age.

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In order to maintain the current level of provision of individual types of social care services throughout the reference period up to 2050 according to model 2, for example:

- the number of places in homes for the elderly will have to increase from 35 596 in 2016 to 89 146 up to 2050, with the largest increase in the capacity of these facilities being required by 2035,
- the number of places in special-purpose homes will have to increase from 15 387 in 2016 to 38 536 up to 2050, with the largest increase in the capacity of these facilities being required by 2035,
- the number of carers will have to increase from 63 701 in 2016 to 98 613 up to 2050, with the largest increase in the number of carers being required up to 2025 and, subsequently, in the period 2035 to 2045.

Table 4. The required development of the capacity of selected social care services up to 2050 while maintaining services at 2016 levels

		2016	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Homes for the elderly	Capacity	35 596	37 945	47 833	63 896	77 326	82 964	85 579	89 146
	Total increase		2 349	12 237	28 300	41 730	47 368	49 983	53 550
	Five-year increase			12 237	16 063	13 430	5 638	2 614	3 567
Special-purpose homes	Capacity	15 387	16 403	20 677	27 621	33 426	35 864	36 994	38 536
	Total increase		1 016	5 290	12 234	18 039	20 477	21 607	23 149
	Five-year increase			5 290	6 944	5 806	2 437	1 130	1 542
Care services	Capacity	63 701	67 314	73 097	77 547	81 478	88 014	95 669	98 613
	Total increase		3 613	9 396	13 846	17 777	24 313	31 968	34 912
	Five-year increase			9 396	4 449	3 931	6 537	7 654	2 945

Source: own calculations

For illustration purposes, in order to ensure the necessary increase in the capacity of homes for the elderly and special-purpose homes up to 2035, it will be necessary for each municipality with extended powers to create an average of 289 extra places during this period. The projection of changes in the structure of clients of individual types of social services in the future according to model 3 would require data on the age structure of clients of each type of service. Given that the average age of clients in homes for the elderly and in special-purpose homes currently stands at around 84 years, the results would not differ significantly from the data according to model 2. In order to quantify the impacts of model 4, it is necessary to take into account the expected increase in the number of care allowance recipients (see Figure 1), which will be reflected in the structure of clients of individual types of services via a general reduction in the proportion of clients who are not in receipt of the care allowance or are in receipt of lower degree of dependence care allowances.

It is possible to employ the results of model 2 as the minimum variants with respect to the quantification of the required increase in the number of employees in individual types of social services. It can be expected that changes in the structure of users of various types of social services in terms of dependency rates will result in the need for a substantially higher capacity increase for all types of social services. In order to quantify the necessary increase in the number of social workers (in the broader sense of the term) it is possible to consider both the ratio between the number of beds per one worker in individual types of social services in 2016 and the legally defined minimum ratio

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of the number of clients per worker in Slovakia (see Table 2). Maintaining the current ratio of the number of places per one worker in homes for the elderly at a level of 1.41 would require, for example, an increase in the number of workers at such facilities of 20 071 up to 2030; however, if this ratio were to correspond to the minimum threshold as defined in the Slovak Social Services Act (2 clients per employee), the number of workers would have to be increased by 14 150. Naturally, similar rates of increases in staff numbers would also be required with respect to other types of social services.

A first glance at these figures suggests that Czech society faces a huge challenge in terms of ensuring the supply of qualified staff to fill the expected personnel deficit in the social services sector. In addition to the introduction of basic systemic changes (Průša, 2015b), it is essential that new fields of study be introduced, and existing courses be significantly expanded at both the secondary and tertiary education levels with regard to the teaching of social work and nursing skills so that, going forward, social services continue to be provided at the current level.

5   Conclusion

The number of care allowance recipients is constantly increasing, with the total number of claimants reaching 354 682 in December 2017, i.e. an increase in recipients of more than 63 thousand on December 2007, with a significant increase in the number of 3rd and 4th degree of dependence recipients. Based on previously employed methodology, the study considered two scenarios regarding the development of the number of care allowance recipients up to 2050, the results of which indicate that by 2050 the number of care allowance claimants will have increased to between 632 and 734 thousand persons. Thus, it is clear that the existing capacity of the various types of social services will not be sufficient to cope with expected client numbers in future years.

More than 80 000 persons were employed in the social services sector in 2016, of which more than 70 000 in social care services and of which around 51 000 in direct care. The study suggests that the number of users of social services considered per one client as defined in the Slovak Act No. 448/2008 Coll., on Social Services, as amended, may provide a guiding principle for the quantification of the expected development of the number of workers employed in social care services. No similar legislation has been introduced in the Czech Republic and has not even been discussed to date by the professional public. The existing wording of the afore-mentioned Decree No. 505/2006 Coll. is very general and, for example, could lead to disputes with respect to the inspection of the provision of social services. Experience gained from the provision of services in clinics for the long-term ill shows that a shortage of workers may significantly reduce the quality of the services provided and jeopardise the fulfilment of the fundamental human rights of clients.

A comparison of the number of employees in selected types of social care facilities with the capacity of these facilities revealed that the aforementioned staff/client ratio was fulfilled in the Czech Republic in 2016 and could therefore be used as the basis for at least a framework quantification of the future need for qualified social workers. It is clear that an increase in the number of persons of post-productive age must also be reflected in an increase in the capacity of individual forms of social services for the elderly including the capacity of residential facilities, despite the fact that currently available Ministry of Labour and Social Affairs conceptual materials continue to promote the thesis that the capacity of such services will not be increased and that care for seniors will be ensured by family members.

A number of model scenarios were employed for the estimation of the development of the structure of individual forms of social care services in the future. The models revealed for example that in order to ensure the required increase in the capacity of homes for the elderly and special-purpose homes up to 2035, it will be necessary for each municipality with extended powers to create an average of 289 extra places during this period so as to ensure that the current level of services is maintained in the future. However, it is only reasonable to expect that the anticipated changes in the structure of clients requiring various types of social services in terms of the dependence rate will lead to the need for a substantially higher capacity increase with respect to all types of social services.

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The above calculations of the number of workers required revealed that maintaining the current ratio of the number of places per one worker in homes for the elderly at a level of 1.41 would require, for example, an increase in the number of workers at such facilities of 20 071 up to 2030; however, if this ratio were to correspond to the minimum threshold as defined in the Slovak Social Services Act (2 clients per employee), the number of workers would have to be increased by 14 150. Naturally, similar rates of increases in staff numbers would also be required with respect to other types of social services. It is therefore essential that new fields of study be introduced, and existing courses be significantly expanded at both the secondary and tertiary education levels with regard to the teaching of social work and nursing skills so that, going forward, social services continue to be provided at the current level.

6   Acknowledgement

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PERCEPTION OF FINANCIAL EXCLUSION PHENOMENON IN POLAND IN THE LIGHT OF EMPIRICAL RESEARCH

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Abstract
The phenomenon of financial exclusion resulting from the lack of access or restriction of access for an individual consumer or group of consumers to a specific portfolio of products offered on the financial market has been known in various forms for thousands of years. For centuries, it was most often associated with limited access to loans and credits. In the twentieth century, with the dynamic development of financial markets and the products offered on them, various types of financial exclusions (pension, investment, credit, savings, payment, insurance) appeared. The article presents the results of surveys on the perception of the financial exclusion phenomenon carried out on a group of 1807 representatives. The purpose of these studies was to attempt to assess the knowledge of issues related to the phenomenon of financial exclusion in the analyzed age group of Poles and to identify determinants that in their opinion directly affect the occurrence of this phenomenon. In the first part of the article presents the level of knowledge of issues related to financial exclusion among representatives. Next, the reasons indicated by the respondents and people potentially at risk of exclusion were presented. In the following, the results of the assessment of the phenomenon carried out by the surveyed people were discussed and it was pointed out who in their opinion is responsible for counteracting the phenomenon of financial exclusion.

Keywords
Financial exclusion, Perception, Social opinions.

JEL classification
G20, G29

1   Introduction

As far as time perspective is concerned, social background, nationality or financial status imposed some constraints on an individual's full participation in a community's social life, executing certain rights or using fully services offered by financial institutions. These phenomena were defined only in the 20th century for the sake of scientific research. Social exclusion was described first in 1988. Several years later, due to limited physical access to banking services in geographical sense, financial exclusion's notion was first used as well (Leyshon and Thrift, 1995). The latter is usually referred to when some individuals or social groups face limited access to the portfolio of products offered by a financial market comparing to other members of a certain group (Richardson and Le Grand, 2002). According to the European Union Commission financial exclusion phenomenon shall be defined as a process during which citizens experience problems concerning the availability of primary market's financial products or services that normally satisfy their needs and enable regular functioning in a society (European Commission, 2008). On the other hand L. Anderloni claims that in general such difficulties concern universal products affecting human's sense of security and allowing active participation in social and economic lives (Anderloni, 2007). Finally, S. Sinclair argues that financial exclusion occurs when there is no access to essential financial services in a sufficient form (Sinclair, 2001).

Despite all similarities in definitions quoted by various authors the phenomenon of financial exclusion is difficult for explicit interpretation by global society members. This issue is approached differently by citizens of high-status industrialized states where 98% of residents own their personal bank account if compared to the third-world countries where less than 30% of citizens have their own

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accounts[1]. Especially when knowing that in the countries of less significant income inequalities lower level of financial exclusion is observed (Kempson et al., 2004).

The very phenomenon can be perceived differently by the residents within the same country – males and females[2], various religion believers or age range representatives.

Performed research allows the statement that financial exclusion is regarded in different ways by the respondents representing different age ranges. Retired respondents raised in the cash era tend to evaluate the issue unlike young people representing the internet age. The former do not treat the lack of bank account as the symptom of exclusion – for them it is rather the deficiency of cash allowing on-time liability payments (Sołtysiak, 2017b). The young generation representatives' level of banking awareness is too high to suspect any difficulties in setting up a bank account by any young person. They would rather consider the lack of opportunity to perform internet services as the financial exclusion (Sołtysiak, 2017a).

2   Research methodology and main outcomes

In the survey entitled „*Perception of financial exclusion phenomenon by Polish society members*" questionnaire was used as the measuring tool. The research sample consisted of 1807 respondents, 909 females (50.3%) and 898 males (49.7%) aged 18 and more. They were categorised simultaneously according to the sex and age criteria into twelve groups: females 18 – 25 years (8.36%), 26 – 35 years (8.08%), 36 – 45 years (8.8%), 46 – 55 years (8.58%), 56 – 65 years (8.36%), 65 years and more (8.14%) and males 18 – 25 years (7.91%), 26 – 35 years (8.25%), 36 – 45 years (8.63%), 46 – 55 years (8.47%), 56 – 65 years (8.14%), 65 years and more (8.3%).

The underlying aim of the research was the attempt to evaluate the awareness of the issues relating to the financial exclusion among Poles. Moreover, to identify groups of people who are, in the respondents' opinion, endangered of such exclusion as well as the determinants influencing the phenomenon's occurrence.

According to the literature overview the research in question may serve as supplementary to already existing research which in most of the cases concentrates on the phenomenon's intensity and determinants influencing its occurrence. It is usually based on statistical data analysis and expert opinions. What is more usually research relates to whole populations and homogenous groups (such as e.g. origin, age or education) both on domestic and international levels (Financial 2015; Triki and Faye, 2013; European Commission, 2008; Corr, 2006; Kempson and Whyley, 1999; Leyshon and Thrift, 1995).

There is still lack of research in Polish literature observed which could allow the assessment of the issue's awareness level and its perception among Polish residents (Sołtysiak, 2017a, 2017b).

2.1   Financial exclusion awareness

To begin with the respondents were asked to explain whether financial exclusion phenomenon is familiar to them. However, it shall be highlighted that before answering the question respondents had every opportunity to check the definition in order to limit the number of faulty answers due to the deficiency in the essential knowledge of the issue.

Considering the research sample 56.44% respondents admitted being aware of the phenomenon of financial exclusion's existence (Fig. 1). Positive answer was more often selected by males (58.13%) than females (54.56%). In the case of women the highest level of financial exclusion awareness was

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[1] For instance over 98% of residents aged 15 and more own their bank accounts in: Australia, Austria, Belgium, Denmark, Estonia, Finland, Netherlands, Japan, Canada, Luxemburg, Germany, New Zealand, Switzerland and Sweden. On the other hand, the smallest number of residents have bank accounts in South Sudan (8.6%), Central Africa Republic (13.7%), Afghanistan (14.9%) and Madagascar (17.9%) (The Little, 2018).

[2] In South Sudan bank account is owned by 4.7% of females, whereas in Pakistan and Afghanistan respectively 7% and 7.2% of females (The Little, 2018).

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signified within the age group 36 – 45 years (61.01%), whereas in the case of males - in the group 56 – 65 years (71.43%).

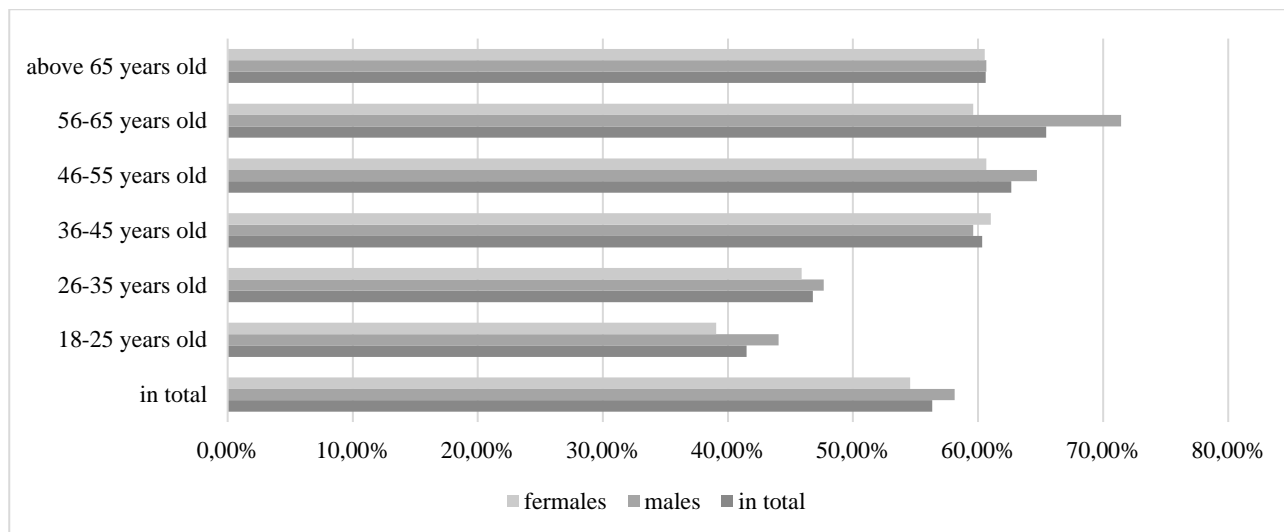**Fig. 1.** Awareness of financial exclusion phenomenon among the survey respondents (Source: own elaboration based on the author's research)

In the following steps the respondents were asked to identify their sources of information on the phenomenon of financial exclusion (see Fig. 2).
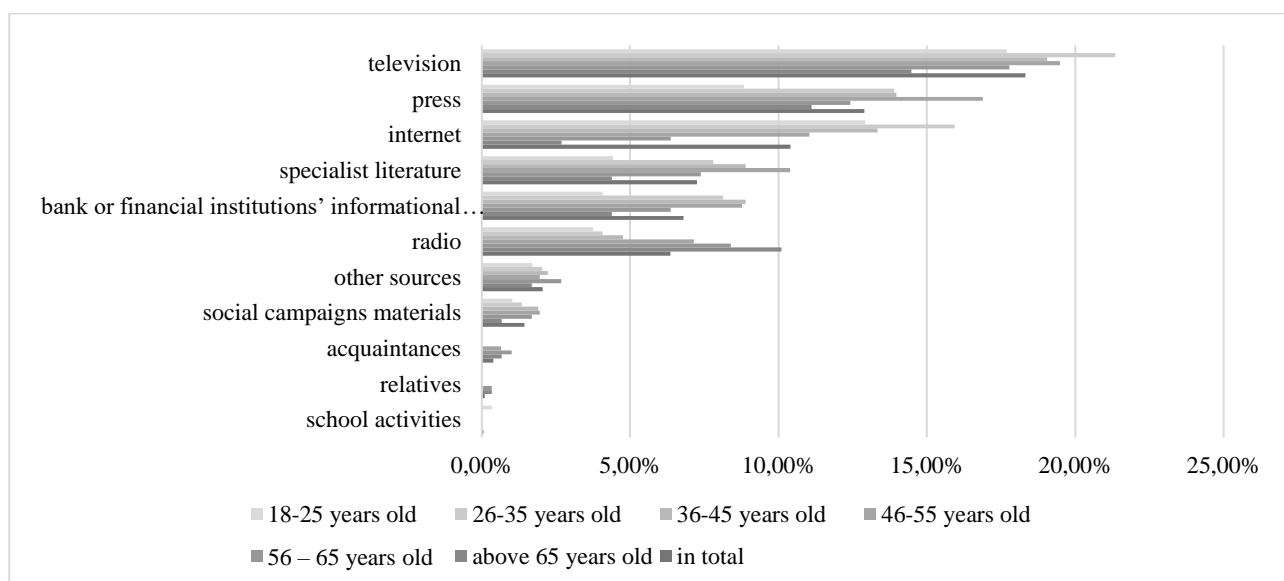
Fig. 2. Respondents' sources of information concerning financial exclusion. (Source: own elaboration based on the author's research)

It should be noted that the survey respondents gained their knowledge on financial exclusion issues mainly from mass media, to quote first television (18.32%) then press (12.89%) and the Internet (10.4%)[3]. 6.36% of the questioned admitted learning about it from the radio[4]. Very limited number of respondents made the effort to dig on the topic in specialist literature (7.25%) or elaborations

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[3] Television and the Internet sources were explored by the respondents from the age group 26 – 35 years and press by those aged 46 – 55 years.
[4] Radio as the source of information was utilised the most often by the respondents aged 65 years and more.

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published by banks or other financial institutions (6.8%). These sources were normally more popular among women rather than men[5]. It should be stressed that mere 1.44% of the respondents admitted having gained the knowledge from informational materials intended for social campaigns.

Such attitude of the research participants may result from their personal opinions on limited availability of the information concerning financial exclusion. Over 72% of the respondents claimed the access to information is limited (32.93%) or very limited (39.51%). Only 4.76% of overall number of respondents claimed the access was significant.

2.2 Financial exclusion causes

Various causes were mentioned as having impact on financial exclusion of an individual by the survey respondents (Fig. 3). Two fundamental reasons of this phenomenon are lack of permanent employment (80.57%) and low income (73.44%). One shall bear in mind that both of them were regarded more often by males than females. The lack of permanent job was regarded respectively by 77.78% of female and 83.4% of male respondents, whereas low level was mentioned by 69.2% of female and 77.73% male respondents. Interestingly enough the older the survey respondents were, the bigger number of them mentioned both of the determinants.

Other reasons of financial exclusion were as follows: low level of education (43.61%) and poor management of financial assets (42.06%). One shall note that poor education was more often regarded by young respondents falling into category of 26 – 35 year age group (51.86% - 54.11% females and 49.66% males). The least attention to this reason was paid by female respondents from 36 – 45 year age group (40.88%) and accordingly by males from 65 and more age group (24%). Taking into consideration the management of financial assets, this cause was vital in the opinion of every second female respondent and for every third male one. It was significant for women aged 65 and more (56.46%) and men aged 46 – 55 years (41.83%).
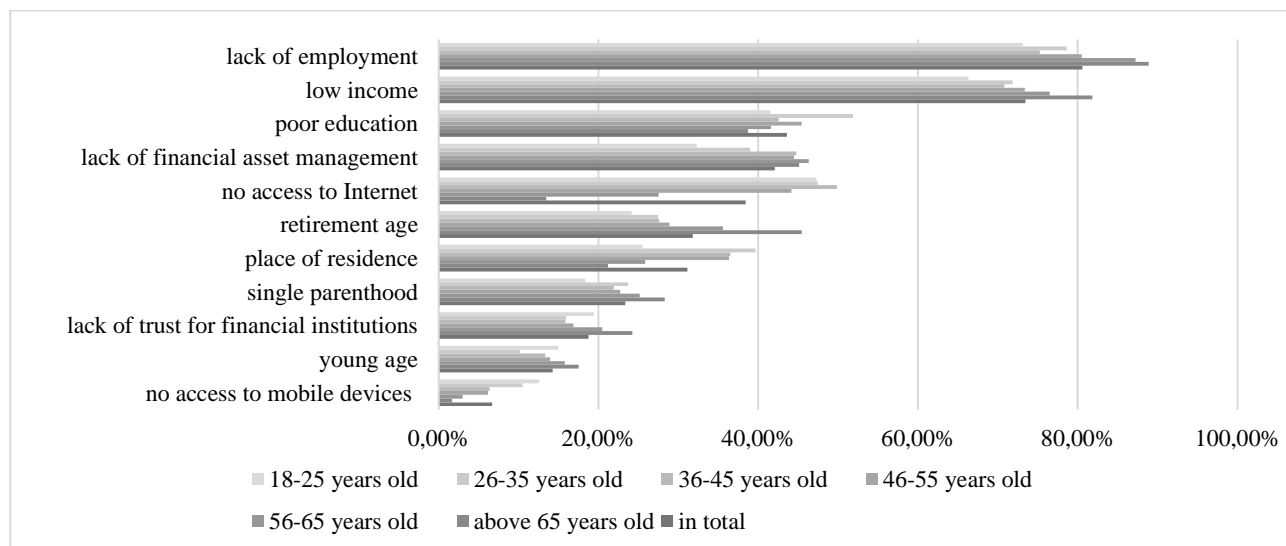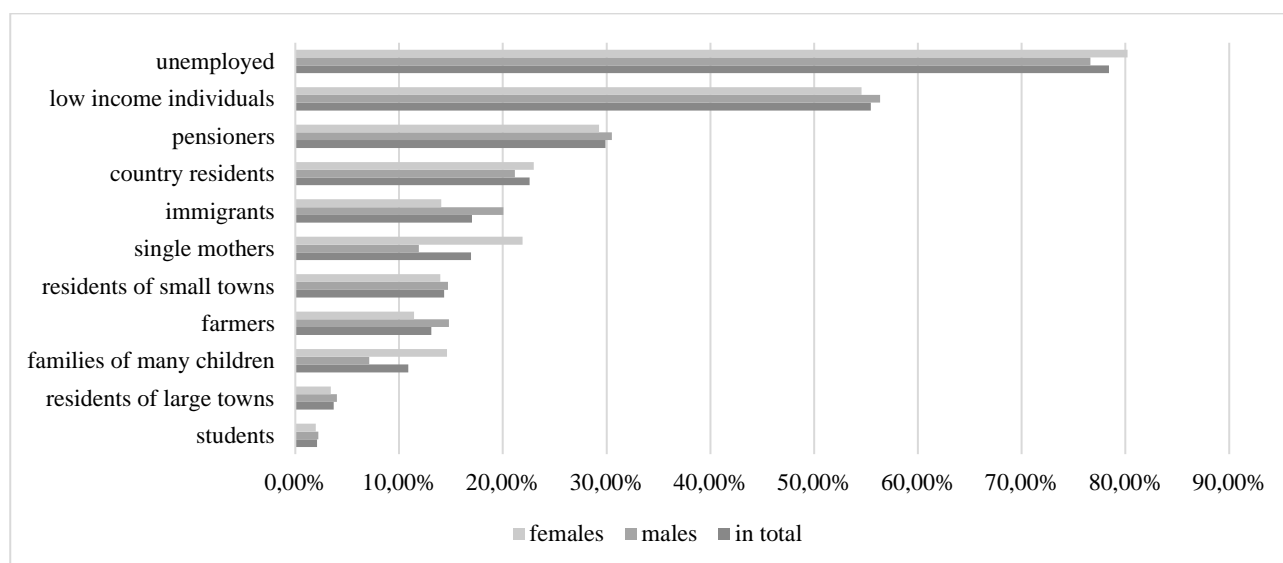

Fig. 3. Fundamental causes of financial exclusion according to survey respondents (Source: own elaboration based on the author's research)

Over 38% of the respondents relate financial exclusion risk to the Internet access. No access to the Internet is directly linked to the opportunity of using state-of-the art distribution channels of financial services, which is nowadays considered as the basis of financial exclusion. This criterion was

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[5] Specialist literature was indicated by 9.02% female and 5.46% male respondents and informational brochures published by banks or other financial institutions by 7.59% female and 6.01% male respondents.

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essential for every second respondent aged below 55 years[6]. Older respondents paid less attention to it, so did they in the case of the access to mobile devices[7].

Every third respondent linked financial exclusion phenomenon to the age of an individual or the place of their residence. The age as the exclusion's determinant was more often regarded by female respondents[8], whereas the residence place – by male participants[9].

One shall also note that every fifth respondent highlighted the lack of trust towards financial institutions among the causes contributing to an individual's financial exclusion. This one was mentioned by 20.46% female and 17.04% male respondents of the survey. It is important to note that this cause was more often regarded by the respondents of 65 years and more (24.24% – 27.89% females and 20.67% males).

2.3 Individuals endangered of financial exclusion

According to the opinion of over 90% of the survey respondents no individual shall feel in jeopardy of financial exclusion. This standpoint was shared by more male respondents (90.76%) as compared to female respondents (89.99%), and the number of respondents with the same opinion grew along with their age. Those with contradicting opinion most often claimed that only individuals having performed some kind of financial abuse should be in danger of financial exclusion (7.58%). Such opinion was expressed most frequently by the respondents falling into age category 36 – 45 years (9.52%) and the least – by those who turned 65 years (4.7%).

Fig. 4. Individuals endangered of financial exclusion according to survey respondents (Source: own elaboration based on the author's research)

[6] The most attention to the Internet access was paid by women aged 36 – 45 years (54.72%) and men aged 26 – 35 years (49.66%).
[7] This answer was pointed out more often by respondents from 18 – 25 year age group (12.58% – 13.91% females and 10.96% males).
[8] Age as the financial exclusion's factor was regarded by 34.32% female and 29.29% male respondents. What should be noted is the fact that this determinant was significant for 58.5% women and 32.66% men, as far as the respondents' age range of 65 years and more is concerned. However, on the other hand young age as the determinant was considered by 13.09% females and 15.48% males. It was also very popular among the respondents aged 65 and more (16.32% women and 18.67% men).
[9] Place of residence was acknowledged as the cause of financial exclusion by 28.16% females and 34.19% males. This was more important for males from the age group 36 – 45 years (42.95%) and the least important for females aged 65 years and more (21.77%).

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The analysis of the respondents' answers concerning individuals potentially endangered of financial exclusion proves (Fig. 4) that in their opinion the unemployed are at most risk (78.42% – 80.2% females and 76.61% males) and the employees earning relatively low income (55.45% – 54.56% females and 56.35% males). It is interesting to know that the unemployed were selected more often by women from the age group of 65 and more (89.79% answers) and the least often by men from the age group 65 and more (69.33%). However, the employee group earning low income was selected most often by men from the age group 65 and more (62%) and the least often by women from the age group 36 – 45 years (47.8%).

The following positions in the survey's rank were occupied by: pensioners (29.88%), immigrants (17.04%), single mothers (16.93%) and farmers (13.11%). Pensioners were selected most often by retired responders aged 65 and more (39.39% - 36.73% females and 42% males). In general, financial exclusion of immigrants was more acknowledged by women aged 65 and more (17.69%) and men from the age group 56 – 65 years (28.57%). Possibility of the exclusion of single mothers was selected by women aged 65 and more (33.33%) and men aged 26 – 35 years (14.09%). In order to clarify this one shall note that the older female respondent was, the higher level of risk was observed – the lowest risk of exclusion was observed in the age group 18 – 25 years (13.91%).

According to the respondents the place of residence plays a significant role in financial exclusion risk – the smaller town or village, the higher risk. They claim that village residents are in the exclusion's jeopardy the most (22.58% – 21.16% female and 22.99% male respondents), less risk is attributed in the case of bigger towns (14.33% - 13.97% females and 14.7% males) and the least for city dwellers (3.71% – 3.41% females and 4.01% males). It shall be noted that in the case of villages' and small towns' residents the doubts concerning financial exclusion rose with the age of the respondents. When it comes to the exclusion of large cities' residents, however, the highest risk was attributed by the respondents from the age group 18 – 25 years (5.44%) and the lowest by those aged 36 – 45 years (1.9%).

According to the opinions of the respondents the phenomenon of financial exclusion does not relate to young, studying individuals. Possibility of such risk occurring in this group is relatively low and was evaluated in this way by mere 2.1% of people surveyed. The highest risk was identified by the respondents aged 65 and more (4.7% – 5.44% females and 4% males). However, in the age group 18 – 25 years the risk was acknowledged by 1.02% of the respondents (1.32% females and 0.7% males).

2.4 Scale of financial exclusion according to respondents

In the survey process the respondents were asked to assess the scale of financial exclusion's phenomenon in Poland (see Fig. 5) and the probability of one's own financial exclusion (Fig. 6). One shall note that approximately 16% of the respondents assessed the possibility of financial exclusion in Poland as large or very large. This opinion was more often shared by women (18.48%) than men (13.36%). Interestingly enough, the highest rate of the respondents fell into the age category 18 – 25 years (19.38%) and the lowest rate in the category 26 – 35 years (14.23%).

Vast majority of respondents claimed the level of financial exclusion in Poland is *low* (38.79%) or *moderate* (40.9%). Lower level of financial exclusion was evaluated by males (83.85%) as compared to females (75.57%). Among women the lowest level of exclusion was selected by those aged 36 – 45 years (78.61%) and among men by those aged 26 – 35 years (87.91%).

Similarly, majority of the survey respondents (76.87%) evaluated their own risk of financial exclusion as low (Fig. 6). Such opinion was more often expressed by female respondents (77.34%) than male (76.39%). In the case of female respondents the risk was assessed on the lowest level by those aged 36 – 45 years (83.02%) and in the case of men, aged 46 – 55 years (80.39%). The highest risk of own financial exclusion was identified by the respondents from age group 26 – 35 years, the highest level of risk was selected by 0.34% respondents. Finally, 12.88% respondents (11.64% women and 14.09% men) considered the risk as high.
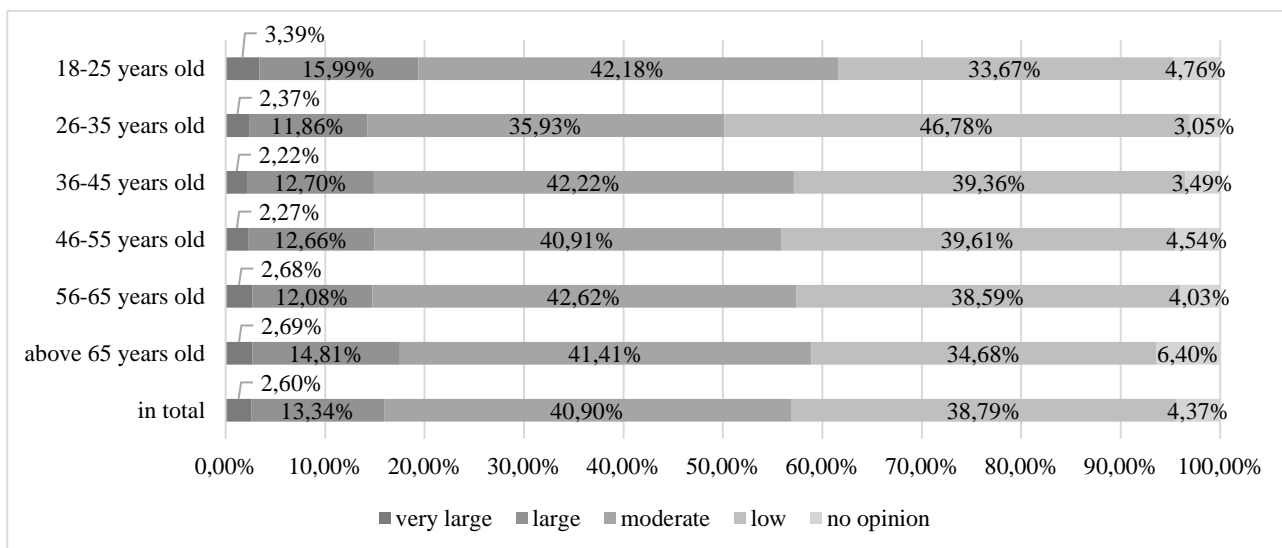
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Fig. 5. Scale of financial exclusion in Poland according to survey respondents (Source: own elaboration based on the author's research)

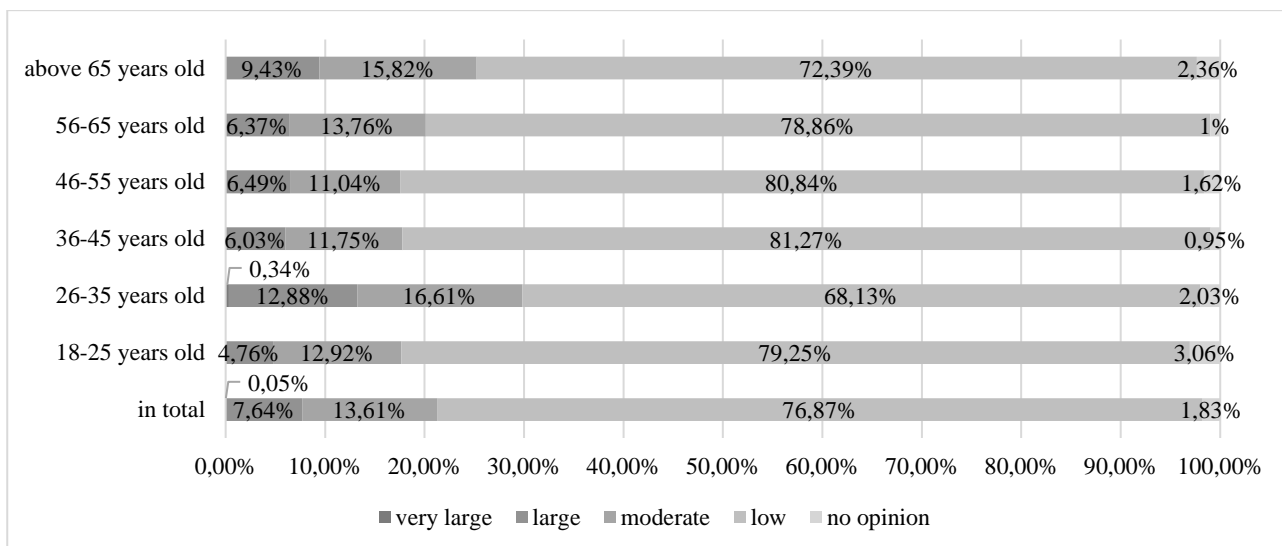**Fig. 6.** Risk of one's own financial exclusion according to survey respondents (Source: own elaboration based on the authors' research)

2.5   Counteracting phenomenon of financial exclusion

The survey participants claimed that counteracting financial exclusion phenomenon should be primarily the state's obligation (88.16%). This approach was mainly presented by the respondents aged 65 years and more (95.96% - 96.6% women and 95.33% men) and the least often by those aged 36 – 45 years (71.43% - 74.21% women and 68.59% men).

   Almost 80% respondents would tend to burden banks with such responsibility and over 56% of them – other financial institutions. This standpoint was more often expressed by females rather than males[10]. Banks were mentioned most frequently by women aged over 65 years (93.2%) and men from

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[10] Banks were indicated by 81.19% women and 77.84% men, whereas financial institutions were pointed out respectively by 56.76% and 56.01%.

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age group 36 – 45 years (94.23%). Other financial institutions, on the other hand, were selected by women aged 65 and more (72.79%) and men 56 – 65 years (80.27%).
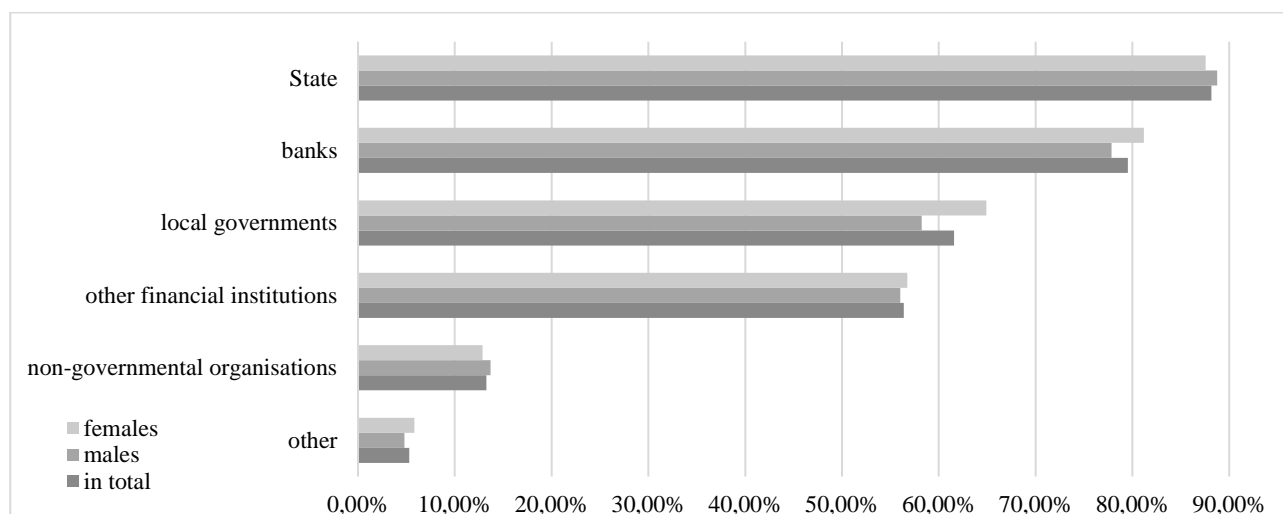
Fig. 7. Entities responsible for counteracting financial exclusion according to respondents (Source: own elaboration based on the author's research)

Over 61% respondents regarded local governments being in charge of undertaking proper actions linked to preventing financial exclusion. These opinions were more often expressed by women[11] (64.91%) than men[12] (58.24%). Every eighth participant of the survey would prefer non-governmental organisations contributing to such activities. Thus, they were mentioned by females aged 18 – 25 (17.88%) and males aged 65 years and more (26%).

3   Conclusions

The issue of financial exclusion related to limited access of individuals or social groups to wide range of services offered on financial markets has been the point of scientific interest for the last three decades only. This phenomenon became more familiar to an average resident at the turn of 21st century, when lots of new financial products were launched and they became available only via the Internet. This contributed to some constraints in using the services – unfortunately available only for those who could afford suitable electronic devices and were lucky enough to live in favourable location with Internet network being available. One shall not forget about the necessity to present sufficient technical and economic expertise by the user.

The conducted research proves that the issue of financial exclusion is still not commonly familiar to the Polish society. Taking into account the research sample, only 56% of the respondents admitted having some awareness of such phenomenon. It turns surprising that the poorest awareness was declared by young people aged 35 and less, those who have had opportunity to learn about it during all stages of their lives. They tend to explain such state with their limited access to information and the fact that they usually gain information accidentally from mass media.

However, it shall be stressed that to the respondents' view there is no significant threat of this phenomenon's occurrence in Poland. Mere 2.6% of the respondents assessed the risk of financial exclusion in Poland as very high and 13.34% as high. They even less often see themselves endangered - 76.87% of the respondents declared their own risk as low if compared to only 0.05% of the

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[11] Local governments were chosen most often by women aged 65 years sind more (92.52%) and least often by those aged 36 – 45 years (42.14%).

[12] Among male respondents local governments were indicated most frequently by those age 26 – 35 years (75.17%) and least frequently in 46 – 55 years age group (32.03%).

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respondents who claimed it was high. They believe it can be referred to the unemployed or those with low income in the first place. Only later they relate it to those having difficulties to access modern financial services due to educational and technical reasons. One shall also remember that only a few-percentage group of the survey respondents argued that this phenomenon should contribute to the limitation of the access to financial services for those who appeared to be financially unreliable (having performed instances of financial abuse).

For recollection, it is important to note that both the state and financial institutions ought to undertake numerous actions to increase social awareness in the matter of financial exclusion. What is more, the actions should not be confined to informing on the financial exclusion itself or its scale. They should aim to minimise the risk of its occurrence in relation to individuals.

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BUDGET OF LOCAL GOVERNMENT UNIT VERSUS STATE OF THE ART AND ENGAGEMENT OF YOUNG GENERATION OF POLES

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Abstract
Functioning of local government units is a very important issue both for the country as well as for a statistical citizen - a resident of a particular community. These are local residents who form self-governing communities within such units which, in particular, are responsible for meeting collective needs of their community. Because of the limited amount of funds available to local government units fulfilling the tasks may contribute to controversies occurring not only among the decision-makers but also individual residents or groups of residents. Therefore, as far as local residents are concerned, having an appropriate level of knowledge concerning such units' functioning, in particular concerning the rules and regulations that condition developing and executing budget, is an extremely important issue. The authorities of local government units should make special effort to familiarise residents with the issues, stimulate their civic activity and try to involve as many of them as possible in the implementation of the tasks. The article presents the results of the survey conducted on the representatives of young generation of Poles regarding their state of the art in the budget of local government units as well as the local community members' engagement in the development and execution of a local government budget.

Keywords
Budget, Local government unit, State of the art and social engagement, Young generation of Poles.

JEL classification
A13, C92, D7, H72

1   Introduction

Each and every individual lives on some continent, is a citizen of some nation and, most of all, a member of some small community functioning with the confines of a particular local government unit. The unit is expected to execute some tasks and duties that do not belong to central authorities' obligations but are bound to satisfy the needs of the community. Thus, the unit's operations lie in the scope of interest of both central government and citizens. Similarly, both wish that the local government develop sufficient infrastructure, efficient social security system as well as satisfy a range of social needs concerning education, health care or cultural issues. Achieving these goals in a manner that would satisfy all interested parties is simply impossible even for most wealthy local governments.

Majority of local governments' authorities annually face the dilemma of allocating their budget. It often raises disputes not only among the decision-makers but also local residents. This usually results from the residents' expectations on one hand, and limited sources in the budget on the other hand. It is clear that a budget primarily must be used to fulfil all tasks and goals that are enforced by the law[1].

For the above reason it seems absolutely significant for local governments to engage highly qualified employees and make sure that local representatives as well as the community members hold proper expertise in the area of local government's operations.

Local authorities should undertake actions aiming to familiarise the residents with financial data concerning not only the budget itself but also money allocated to particular tasks. They should allow the residents to learn in principle about financial management of local governments in the first place. What is more, they should empower the residents to influence directly the management of a selected

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[1] Tasks that local government units in Poland are bound to fulfil in order to satisfy collective needs are specified in the Act [Ustawa].

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part of the government's budget. This could contribute to surmounting obstacles between residents and local authorities as well as enhancing interest in public affairs among local community members. Apart from educational effect such actions could substantially influence the development of local community bonds and increase the residents' sense of accountability for their place of residence.

2   Methodology and research objectives

In the research entitled "Society's state of the art in a budget of local government units and social engagement in developing local government budgets" questionnaire was used as a measuring tool[2]. The article comprises selected issues from conducted research and referring solely to the young generation of Poles. For the above reason, the very research sample considered in the study included 299 individuals aged from 18 to 35 years. Simultaneously, the respondents were categorised using criteria of sex and age into four segments: women 18 – 25 years (26.42%), 26 – 35 years (24.75%); men 18 – 25 years (24.41%), 26 – 35 years (24.41%).

Fundamental objective of the research was the attempt to evaluate the state of the art in budgeting local government units of young members of local communities and estimating their engagement in this aspect.

According to the literature review the conducted research can be treated as supplementary to the so-far findings of the phenomenon, which are mainly focused on the state of knowledge of local governments officers [Skica, 2011, Ministerstwo Finansów, 2012] and aldermen [Nogalski and Kozłowski, 2014]. What is still missing is the research enabling the assessment of the phenomenon's awareness and perception by Polish society [Sołtysiak, 2017].

3   Local government units and residents' state of the art

Almost three quarters of the survey respondents (76.47% females and 72.6% males) claimed they had sufficient knowledge in local government operation. This was declared most often by women in age group 26 – 35 years (77.03%) and least often by men aged 18 – 25 years (71.23%).

However, it should be stressed that men assessed their own knowledge in this particular topic higher than women (Fig. 1). Over 30% females described their knowledge as scarce or little and only 14.53% females considered their expertise as high or very. Respectively, 24.53% questioned males evaluated their knowledge as "scarce" or "little" and 17.92% as "high" or "very high".

Studying the awareness level among the respondents in selected segments one shall notice that significantly higher level was declared by those in 26 – 35 years age group.

In order to verify the above declarations in the following part of the study a number of questions concerning fundamentals of local governments were asked. Those included such as: "How many hierarchy levels in local government can you identify in Poland?" or "Can you name the units of local government?".

Correct answer to the first question was provided by 69.23% respondents (70.59% females and 67.81% males). In the case of the second question positive answer was given by 80.94% respondents (81.04% females and 80.82% males, respectively). Those who answered in a positive manner were asked in the following question to name the units. Correct answers were given by 91.74% respondents (91.94% females and 91.53% males). Thus, correct classification of local government units in Poland was provided by 74.25% young individuals taking part in the survey – 74.51% females and 73.97% males. It is interesting to note that the names of the units were identified correctly more often by younger respondents aged 18 – 25 years (76.32%) than those of 26 – 35 years (72.11%).

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[2] The survey engaged a group of 889 respondents (including 447 females (50.28%) and 442 males (49.72%)) 18 years and older, residing in the provinces in the South-Eastern Poland.
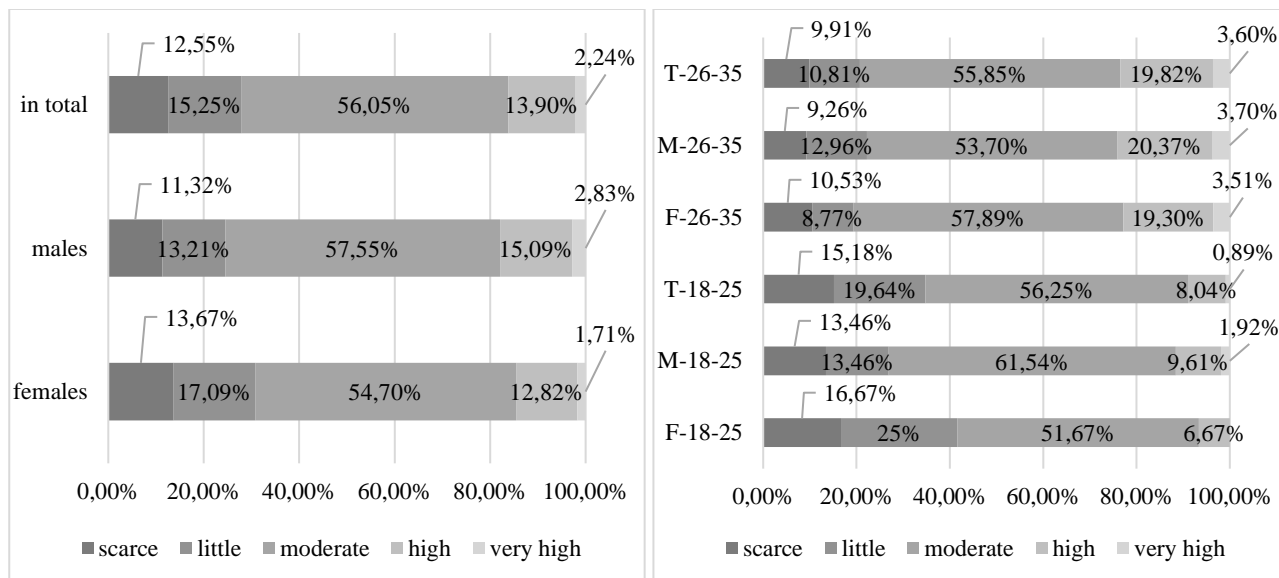
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Fig. 1. Respondents' self-assessment of the state of the art in local government units operation[3].
(Source: own elaboration based on the authors' research)

4   Familiarity with issues concerning local government budget among study respondents

According to the study, young individuals that are classified as young generation are critical about their state of knowledge in local government functioning (Fig. 2). Mere 27.09% respondents declared familiarity with the issues concerning the development and execution of local government budget (28.1% females and 26.03% males, respectively). One shall note that in the age group 26 – 35 years (36.05%) twice as many respondents, if compared to 18 – 25 years age group (18.42%), admitted having such knowledge.
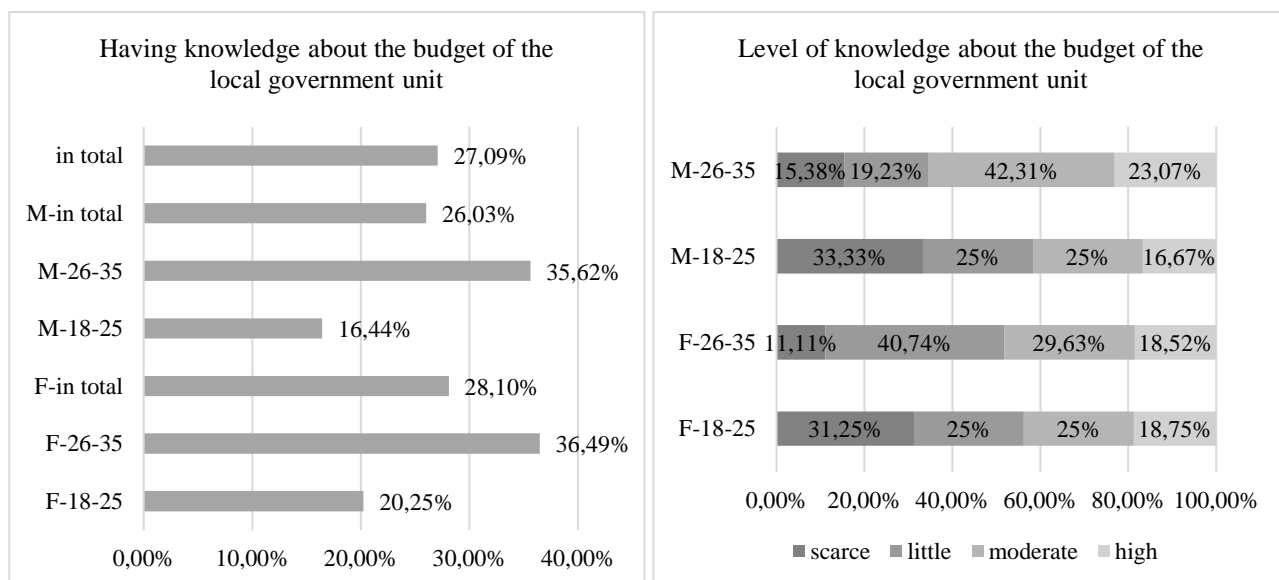
Fig. 2. Respondents' self-assessment of the state of the art in development and execution of local government budget local government units operation. (Source: own elaboration based on the authors' research)

Moreover, even if the respondents declared familiarity within the aforementioned area, they did not regard it very significant whatsoever (Fig. 2). None of the young generation respondents selected

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[3] Labels in the diagram – F – females, M – males, T – in total; for instance F-18-25 – females 18 – 25 years old, M-26-35 – males 26 – 35 years old.

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the answer "very high". 19.75% the questioned (17.86% females and 20.75% males) selected the answer "high"[4] and 32.1% respondents (27.91% females and 36.84% males) the answer "moderate". Finally, the answer "little" was chosen by 28.4% respondents (34.88% women and 21.05% men) and "scarce" 19.75% respondents (18.6% women and 21.05% men).

In the following stages of the study the actual state of the art was evaluated by enquiring about the budget functioning issues referring to local government units. The respondents were asked to identify authorities that in their opinion are in charge of developing, approving and executing a local budget. The study proves that in the opinion of young Poles the responsibility to develop a local government budget is held by the unit's employees (Fig. 3a). Almost 89% respondents (85.62% females and 92.47% males) identified a "treasurer/chief accountant" as primarily accountable for developing a budget and 74.58% respondents (76.47% females and 72.6% males) pointed at a "mayor/commune head/president". One shall bear in mind that the respondents from the age group of 18 – 25 years selected option "mayor/commune head/president" more often and the representatives of 26 – 35 age group pointed more often at a "treasurer/chief accountant".
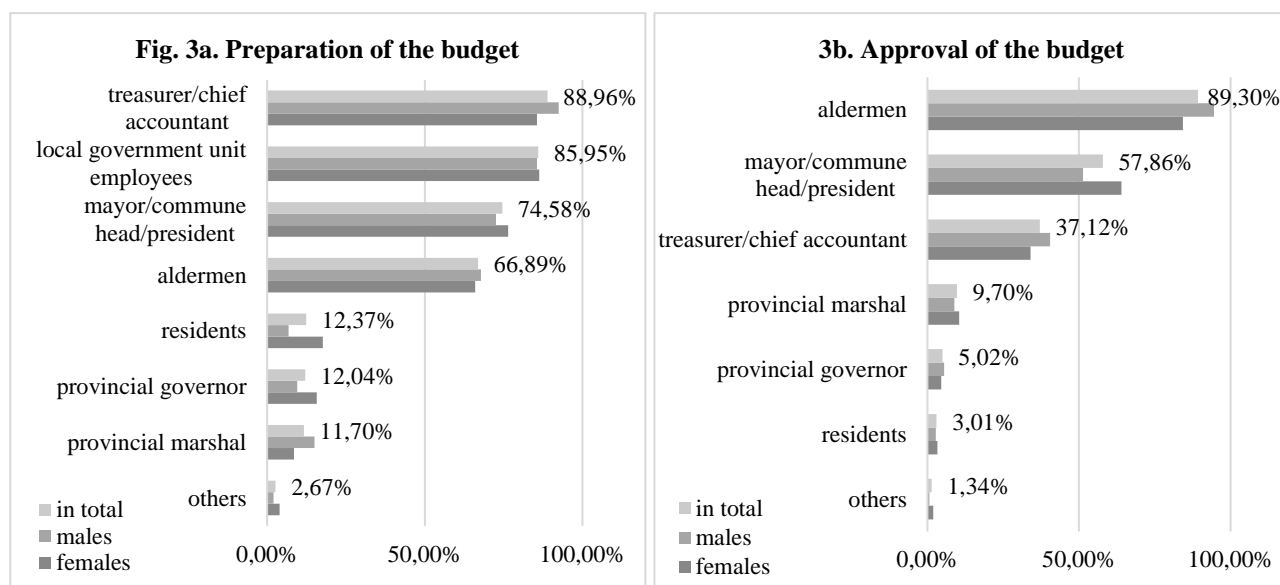
Fig 3. Authorities accountable for developing budget draft and approving of local government budget according to survey respondents. (Source: own elaboration based on the authors' research)

Two thirds of the respondents (66.01% females and 67.81% males) attributed the obligation to aldermen. This standpoint was shared more often by the questioned falling into age group of 26 – 35 years (70.07% - 70.27% females and 69.86% males) rather than younger respondents aged 18 – 25 years (63.82% - 62.02% females and 65.72% males).

In the opinion of every eighth respondent residents also are involved in the budget development. Interestingly enough, the "residents" answer was selected by 17.65% women and only 6.85% men. One shall note that younger respondents aged 18 – 25 years (16.44%) chose the very option more often than respondents aged 26 – 35 years (8.16%).

There were 12.04% respondents in the research sample who claimed that a provincial governor participates in the process and 11.7% others who pointed at a marshal's contribution. The former answer was more popular among women (15.69%), the latter among men (15.07%). Both answers were more popular in the age group 18 – 25 rather than in 26 – 35 age group.

However, in the opinion of 89.3% survey participants´ responsibility for approving of the budget was held by aldermen (Fig. 3b). This standpoint was shared by 84.31% women and 94.52% men. It

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[4] Taking into account the whole research sample nobody regarded themselves expert in that field. Mere 5.35% respondents (females and males - 5.23% and 5.48%, respectively) evaluated own expertise in the field as high. It shall be highlighted that this answer was more often chosen by the questioned falling into age group 26 – 35 years (7.48%) than those aged 18 – 25 years (3.95%).

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was more popular among the respondents falling into the age category of 26 – 35 years (91.16%) than those aged 18 – 25 years (87.5%).

Nearly 60% respondents persuaded that the person in charge of authorising local government budget is a "mayor/commune head/president" and one third of respondents would see a "treasurer/chief accountant" in charge. It should be highlighted though that women taking part in the survey more often than men pointed at the "mayor/commune head/president" answer (64.05% and 51%, respectively). On the other hand, men were more likely to select "treasurer/chief accountant" (40.41% and 33.99%, respectively). Taking into consideration the opinion of particular age groups it has been noticed that the respondents of 18 – 25 age group selected the "treasurer/chief accountant" more often than the respondents of 26 – 35 age group chose the "mayor/commune head/president"[5].
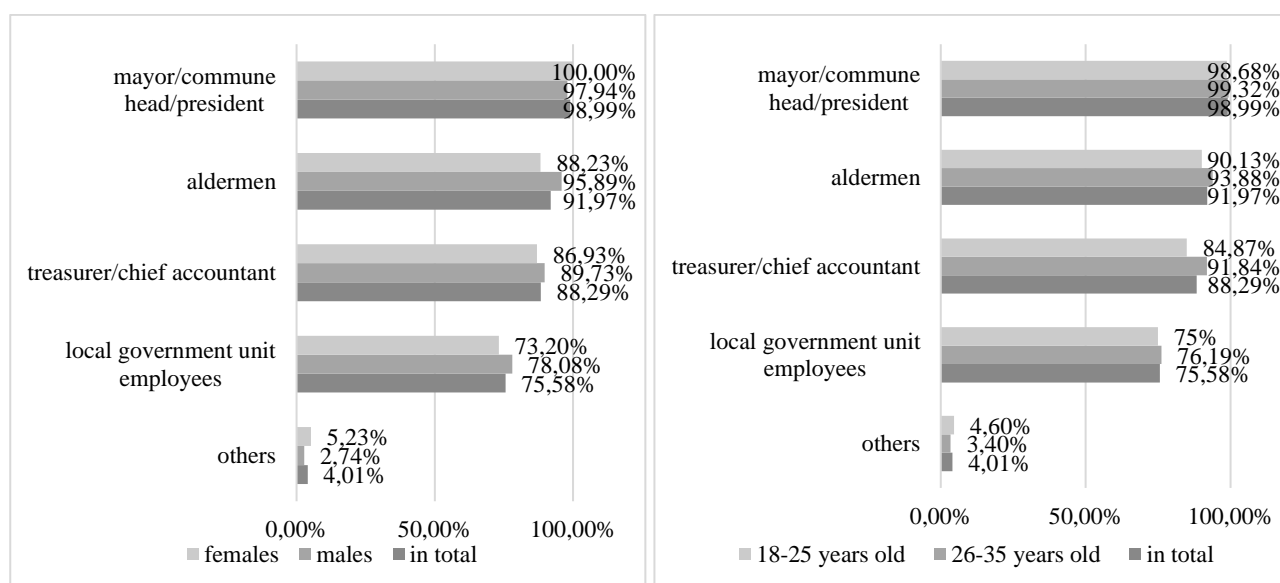
Fig. 4. Authorities accountable for executing local government budget according to survey respondents.
(Source: own elaboration based on the authors' research)

Answering the question concerning budget execution the respondents regarded a "mayor/commune head/president" in the first place (Fig. 4). Nearly 98.99% of the surveyed chose the answer (100% women and 97.94% men). The second most popular answer was "aldermen" - it was selected by 91.97% respondents (88.23% females and 95.89% males). The following answers were the "treasurer/chief accountant" (88.29%) and "local government unit employees" (75.58%).

The next point of interest in the research was to find out about financial sources forming local government budget from the respondents' point of view (Fig. 5). The young respondents claim that in principle there are two major sources of local budget financing, such as central budget (75.92%) and taxes (70.23%). Both sources were selected more often by males than females, and respondents from 26 – 35 age group than those of 18 – 25.

The third most popular source cited by the respondents were the EU funding (44.15%). They were more often selected by men than women (47.94% and 40.52%, respectively) and older respondents (26 – 35 years old) than younger (18 – 25 years old) - 51.7% and 36.84%, respectively).

It is worth mentioning that according to some of the survey respondents there are also other sources of financing local budgets such as local fees and own income. Local fees were ticked by 12.04% respondents and own income – by 9.7%. In terms of both answers, they were more popular among males than females. It should be highlighted that local fees were selected by 9.87% respondents of

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[5] The "treasurer/chief accountant" was chosen by 38.81% respondents 18 – 25 years old and 35.37% respondents 26 – 35 years old.
The "mayor/commune head/president" was chosen by 55.92% respondents 18 – 25 years old and 59.86% respondents 26 – 35 years old.

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18 – 25 age group and 14.28% of 26 – 35 age group. However, own income as the financing source was chosen by 7.89% respondents of 18 – 25 age group and 11.56% of 26 – 35 age group.
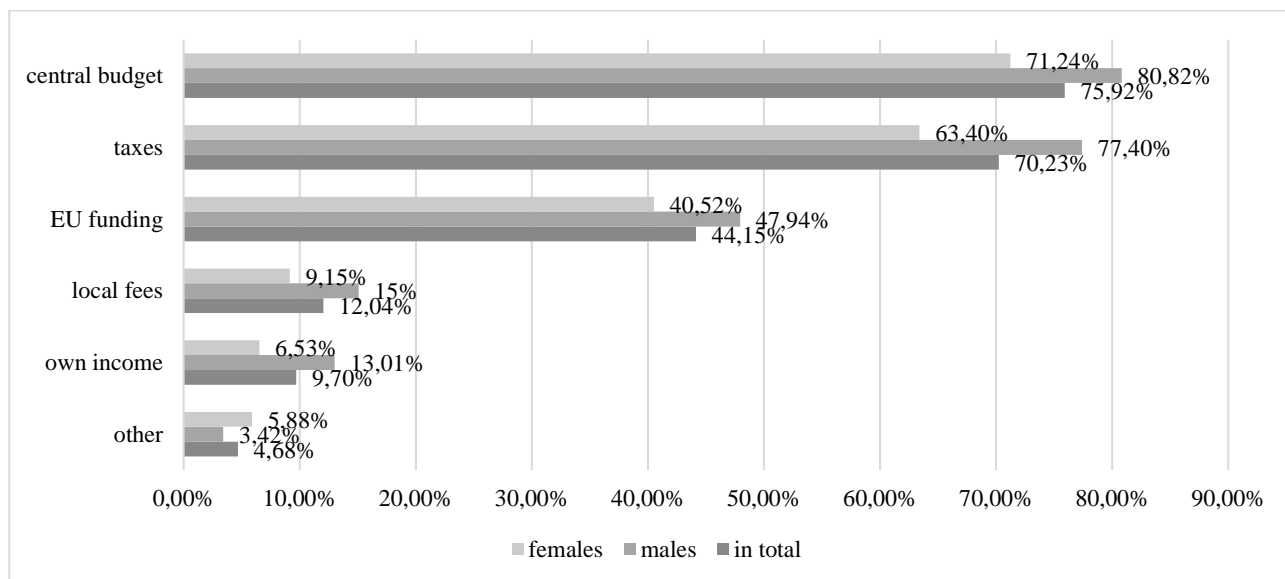

Fig. 5. Financial sources forming local government unit budget according to respondents.
(Source: own elaboration based on the authors' research)

The survey participants also expressed their opinions as it comes to the objectives that should be met by local governments (Fig. 6). Vast majority of the respondents (92.98%) acknowledged the importance of tasks related to education and children upbringing. The following tasks that were considered significant by the surveyed were such as: social assistance (36.45%) and health care (30.1%). For women health care was more important (32.68% women and 28.77% men) and for men social assistance was of primary significance (32.68% women and 40.41% men). It should be highlighted that these two tasks were more essential for the respondents falling into the age group of 26 – 35 years[6].
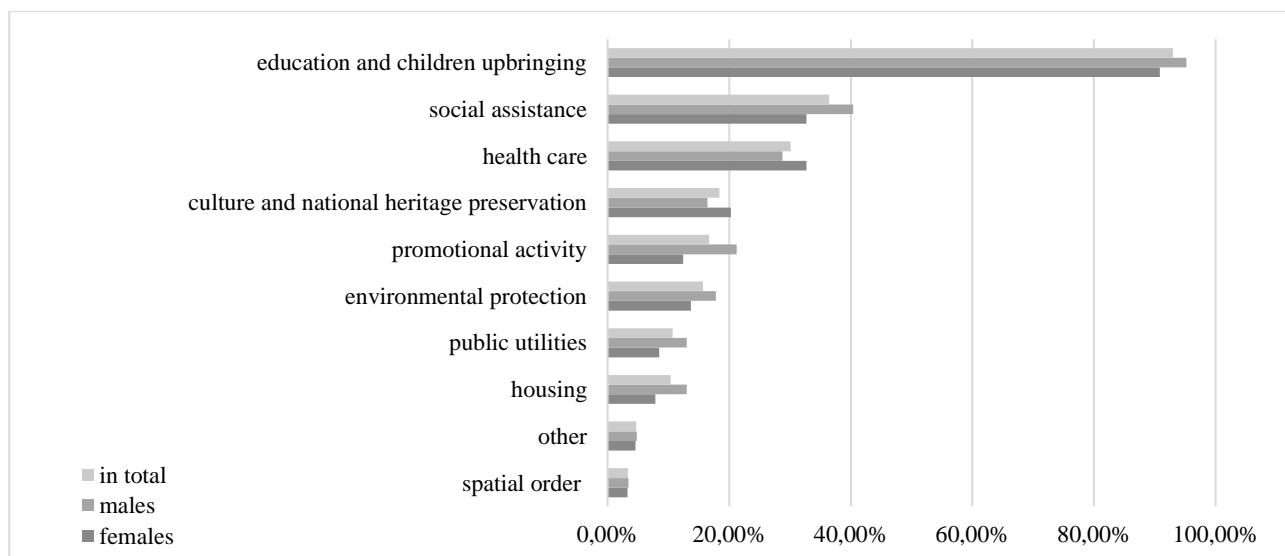

Fig. 6. Objectives to be achieved by means of local government expenditures according to respondents.
(Source: own elaboration based on the authors' research)

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[6] Social assistance was indicated by 34.87% respondents aged 18 – 25 years and 38.09% respondents aged 26 – 35 years.
  Health care was indicated by 25% respondents aged 18 – 25 years and 35.37% respondents aged 26 – 35 years.

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Every fifth respondent claimed local government expenditures shall be devoted to tasks concerning „culture and national heritage preservation", whereas every sixth respondent would spend the money on local government promotional activity. The former task was more often acknowledged by women than men – 20.26% and 16.44%, respectively. When it comes to the latter one, however, men were more likely to select the answer than women – 21.25% and 12.41 %, respectively.

Every sixth participant of the survey selected tasks related to „environmental protection" and every tenth – „public utilities" and „housing". These tasks, in turns, were selected more often by men and older respondents (26 – 35 years old).

5   Sources of information on local government budget operation

In general, the survey participants' scope of knowledge on local government functioning depends on the sources used. The survey outcome proves that in the case of young generation the Internet serves as the main source of information (Fig.7). It was indicated by 29.43% respondents (28.1% women and 30.82% men); used more often by those aged 26 – 35 years (31.97%) than those aged 18 – 25 years (26.97%). One shall also bear in mind that every ninth participant of the survey (8.22% females and 13.72% males) declared using social media as a source of information.
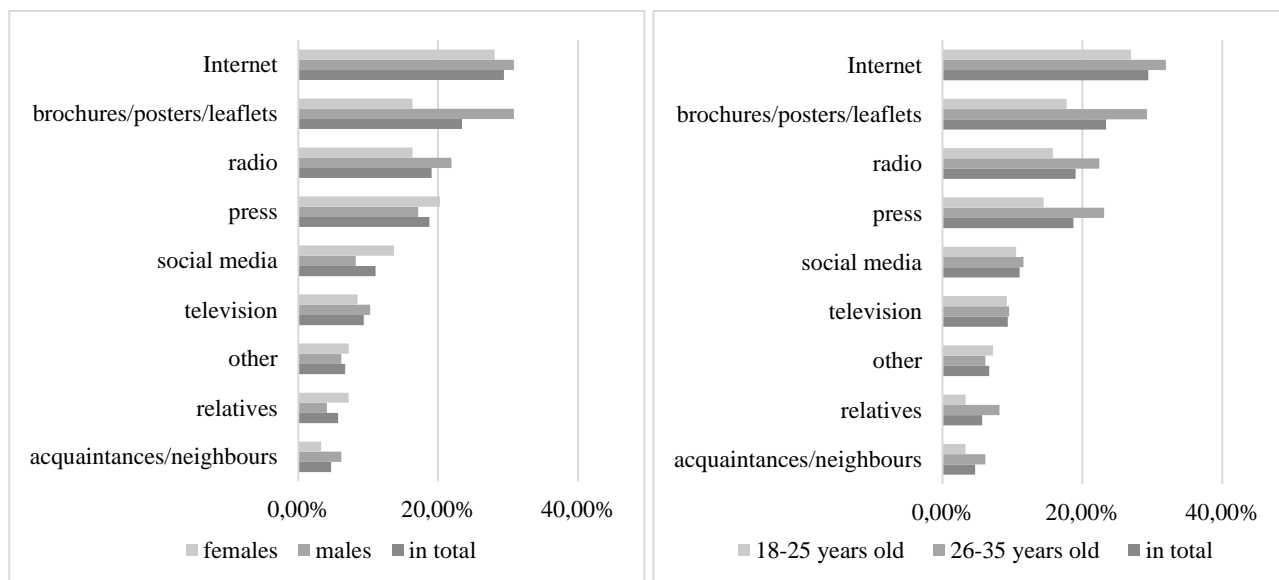

Fig. 7. Sources of information respondents use to learn about local government unit budgeting.
(Source: own elaboration based on the authors' research)

The second most popular answer was „brochures/posters/leaflets" (23.41%). These sources were mainly used by men (30.82%) than women (16.34%), as well as the respondents aged 26 – 35 years (29.25%) compared to those aged 18 – 25 years (17.76%).

The following positions in the rank were occupied by the sources such as mass media - radio (19.06%), press (18.73%) and television (9.36%). There was also a certain group of respondents that took advantage of information gained from family or relatives (5.68%), neighbours or acquaintances (4.68%).

6   Engagement of local community in developing local government budget

To evaluate the engagement of local community members in the process of developing a local government budget an attempt was made to check the opinion of the respondents on whether residents should or not be empowered to influence the local government budget. It was discovered the young people believed they should be given such opportunity (Fig. 8). This statement can be supported by the number of answers "definitely yes" and "rather yes" which were selected by 76.25% respondents

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in total (73.85% females and 78.77% males). On the other hand, answers "definitely not" and "rather not" were less often and equalled 13.71% respondents (13.07% females and 14.38% males).
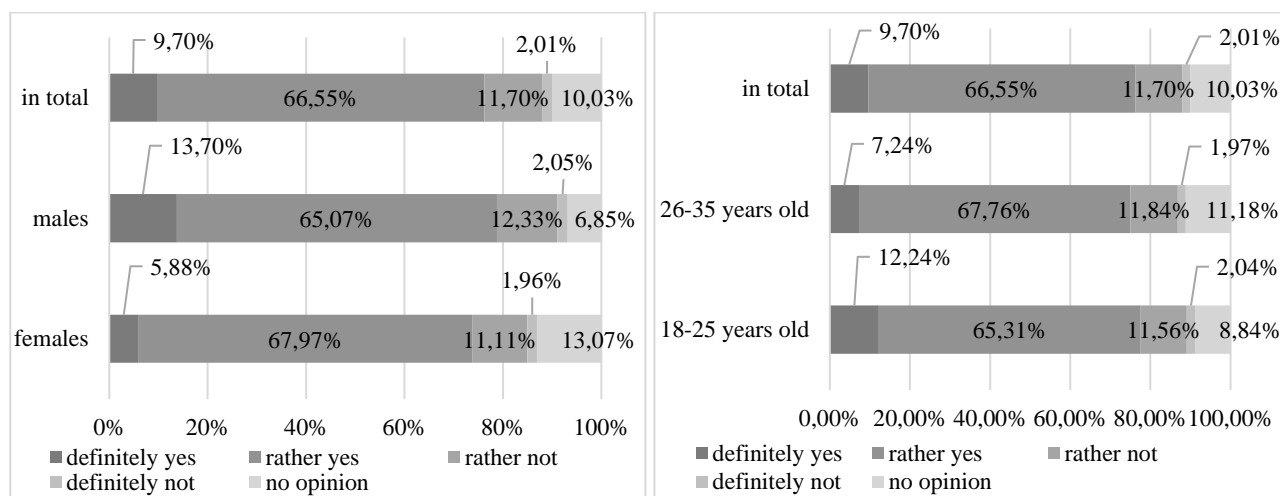

Fig. 8. Opinion of respondents on whether residents should or not be empowered to influence local government budget. (Source: own elaboration based on the authors' research)

Unfortunately, these answers do not reflect the real engagement of young generation in this process. Only about 21% respondents (20.91% women and 21.92% men) declared having undertaken any action to learn about local government unit in their residence area. Mere 5.35% survey participants admitted taking part in any kind of action concerning the budget of their local government. It is interesting to note that women seem to more devoted in this case (5.88%) as well as older respondents, 26 – 35 years old, (8.16%). On top of that only 3.34% the respondents declared they had participated in a local community meeting. 2.67% respondents met their community aldermen and 1.67% - a mayor, president or commune head. None of them declared having officially addressed a local task to fulfil.

6.1 Participatory budgeting and residents' engagement

For the last several years Polish local governments, likewise other 2.5 thousand governments worldwide [Sintomer 2014], have allowed their residents to cooperate in allocating selected budget funds to local needs. This generally takes from the idea of participatory budgeting originally developed in the South-American city of Porto Alegre over thirty years ago [Wampler]. The survey's young participants were asked to specify whether the idea of participatory budgeting is familiar to them. It turned out that 20.74% respondents were familiar to this notion. However, it shall be stressed that in the case of the participants who live in an area where participatory budget has been already implemented the share of respondents knowing it equalled 80.39%. Sadly, in the case of localities where it has not occurred yet, mere 8.47% respondents were aware of the notion[7].

It shall be stressed that despite the lack of knowledge in the issues of participatory budgeting of the survey respondents as well as relatively significant knowledge deficiency among those who declared knowing the idea[8], majority of them (53.51%) argue residents should be given the authority to share decision-making in this aspect (Fig. 9). What is more, 44.15% respondents believe their area's local government unit should implement the idea of participatory budgeting in the future.

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[7] For the sake of comparison in the survey entitled *"Engagement of local community members of Rzeszów city in participatory budgeting"* over 77% respondents (including 76.15% women and 79.43% men) declared being familiar with participatory budgeting principles and functioning. (Sołtysiak and Suraj, 2016)

[8] 58.06% respondents evaluated their expertise in the topic of participatory budgeting as "scarce" and 19.35% as "little".

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Finally, 41.47% surveyed (41.83% females and 41.09% males) declared readiness to attend participatory budget polls.
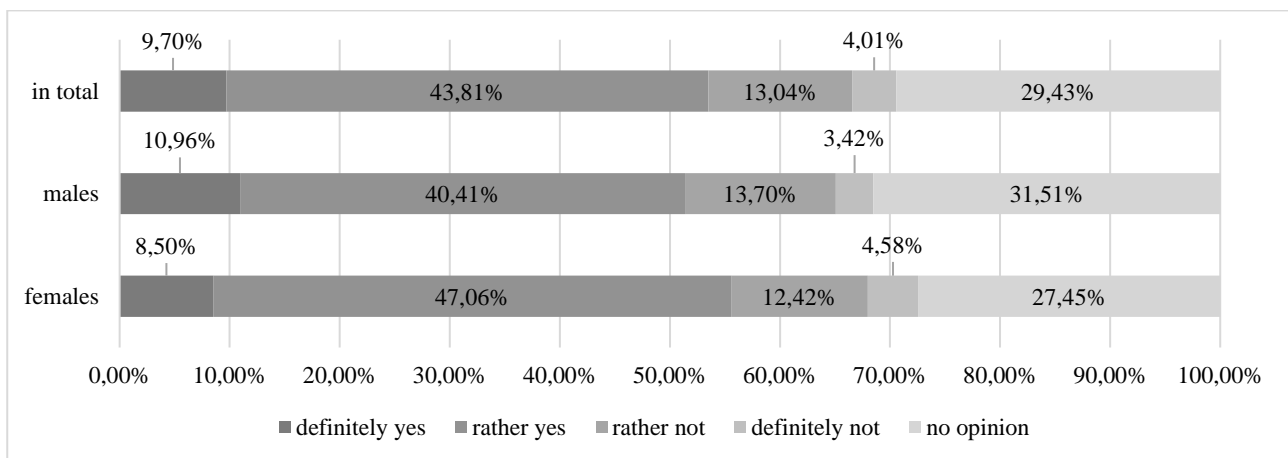

Fig. 9. Opinion of respondents on whether residents should directly participate in approving of local government budget by voting in civic (participatory) budget. (Source: own elaboration based on the authors' research)

7 Conclusion

Having evaluated the awareness of the issues concerning operations of local government units in Poland by the young generation representatives allows the conclusion that, based on the research, to most of them the issues are familiar, even though the level of expertise is relatively low and mere one fifth of them show interest in gaining information on this topic. Thus, it seems reasonable for local authorities to undertake certain actions that would contribute to raising awareness on local government functioning among school pupils and students. Simultaneously, some actions seem essential in order to spark more interest in local communities' operations among representatives of young generation of Poles. Raising awareness in that field will contribute to civic society growth and have an effect on improvement of young generation civic activity.

Taking into account the activity of young representatives in local communities in the development and execution of local government budgets, it can be noted that the vast majority of respondents share opinion that residents should be empowered to tailor their local government budget. Surprisingly enough, the demand and expectations are not reflected in the residents' real activity in this aspect. Only one fifth participant of the research admitted learning about local government budgeting principles in their residence area and mere every twentieth of them made any effort to influence the shape of their local budget.

However, the research in question proved that the expansion of the idea of participatory budgeting may significantly influence the activity of young generation of Poles in the nearest future. Most respondents can see the opportunity in the idea of participatory budgeting as it comes to the quality of life improvement and declare their willingness and readiness to participate in voting polls if their local government units decide to launch the idea in practice.

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CURRENT METHODS AND PRACTICES FOR EVALUATION THE EU SOCIAL RESILIENCE: COMPOSITE INDEX APPROACH

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Abstract
Regional economies have always been prone to different kinds of shocks such as economic downturns, industry shocks, financial and monetary crises, which can destabilize the path and pattern of regional economic growth. Economic growth has lifted hundreds of millions out of poverty and improved the lives of many more over the last half-century. The question of how to measure development has attracted the attention of economists and other social scientists as well as non-government organizations and policy-makers for many decades. Right measurement is a powerful instrument for social progress; wrong or imprecise measurement a source of hazard and even havoc. Measurement of a region's progress plays a crucial role in improving the prosperity and quality of life of regional communities. This process has however proven difficult as contemporary views on the measurement of regional development are presented as multi-dimensional concepts. Several methods of evaluating regional economies exist, most of the methods have their own limitations in the selection of relevant indicators and weighting scheme. Despite the limitations, several approaches in the form of composite indices have been proposed by the European Union and the other institutions. This paper discusses the challenges faced in the design of composite indices of regional development in socio-economic issues.

Keywords
Composite Index, European Union, Method, Region, Social Resilience.

JEL classification
B41, C82, E24, O18, R11

1   Introduction

Improving the standard of living and quality of life for societies has undoubtedly become one of the most important objectives across the globe. The achievement of this developmental objective is a complex and difficult issue. Preceding views on the attainment of higher output as a means to its achievement have faded away on the basis of higher global inequalities and incidences of poverty, notwithstanding the presence of strong economic performances. Greater emphasis has thus been directed towards the collective improvement of social, cultural and economic aspects of areas, resp. multidimensional aspects and endowment of territories. Economic development in this regard has been viewed as an important process which asserts an enhancement of both qualitative and quantitative features in territories contributing to higher levels of prosperity (Meyer et al., 2016). However, as a multidimensional process, the measurement of the progress which societies have made in their developmental efforts has proven to be difficult but also very popular. A society which fails to address basic human needs, equip citizens to improve their quality of life, protect the environment, and provide an opportunity for its citizens is not succeeding. It is only human to try to find easy and straightforward answers to vital questions in an increasingly complex world. Evaluation of socioeconomic progress is a measure of the economic and social status of an individual or group of individuals based on education, income, occupation, and other relevant indicators, relative to other members of the population. Current socioeconomic issues in relation to the financial dimension of service development are examined by Halásková and Halásková (2014). The development of the modern economy has been made possible by continuous development and refinement of tools and measures.

Right measurement is a powerful instrument for socio-economic progress, which is why efforts are constantly being made to improve their power and precision; wrong or imprecise measurement a source of hazard and even havoc. The essential purpose of economic activity is the promotion of human development, welfare and well-being in a sustainable manner, and not growth for growth's

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sake, yet we lack effective measures to monitor progress toward these objectives. Even when evaluating business results of company, profit is no longer the only indicator of its success or failure (Pakšiová and Lovciová, 2018). Advances in understanding, theory and measurement must necessarily proceed hand in hand. Measuring multiple dimensions of socioeconomic progress is indispensable to understanding its components, benchmarking success, and catalysing improvement. What level have we reached in comparison to others? Are we doing well? Are we going in the right direction? Are we catching-up or lagging behind? Are we meeting benchmarks or are we missing them? Are we using our fair and sustainable share of resources or too much? Is a group of economies converging or not? Just to list a few. At the same time, we are surrounded by an abundance of indicators trying to provide answers to these questions, at different levels of sophistication, in many cases serving as a basis for evidence-based policy decisions. Such indicators often seek to measure much aggregated but also diffuse concepts, rich in value judgements but not always grounded in hard science. The most prominent examples we see are indicators of "economic development and performance". In recent years these have been complemented by alternative "progress" and "well-being" measurements. These indicators are frequently presented in dashboards and scoreboards, as well as aggregated or model-based composite indicators or indices (CIs). In recent years, international organizations, think-tanks, and the social sciences have contributed to a dramatic expansion in the range of CIs indices measuring concepts such as human development, governance, or social capital. Therefore, a large number of composite indexes of economic and social well-being have been developed. Unfortunately, the methodological issues associated with CI construction have often been neglected or inadequately treated by index developers. The objective of this paper is to provide a comprehensive review of the methodological choices involved in the construction of CIs of economic and social well-being and the implications of the choices for the properties of CI. This paper discusses the challenges faced in the process of CI construction using the conventional methods.

2   Importance of resilience concept

Over the past few years, a new buzzword has entered academic, political and public discourse: the notion of resilience – a term invoked to describe how an entity or system responds to shocks and disturbances. Within the years, there have been a number of attempts to explore and analyse various aspects of resilience. The concept of resilience is routinely used in research in disciplines ranging from environmental research to materials science and engineering, ecology, psychology, sociology, and economics, it is thus now invoked in diverse contexts, both as a perceived (and typically positive) attribute of an object, entity or system and, more normatively, as a desired feature that should somehow be promoted or fostered (Martin and Sunley, 2015). Given this rise and spread of resilience talk, it is not surprising that the notion should have found its way into economic geography and regional studies. In recent years, ongoing changes, influenced by global economic crisis, affected all components of the regional economy. There is thus increasing interest not only in the resilience of regional economies, but local and urban economies too. However, this rush to use the idea of regional and local economic resilience in policy circles has arguably run somewhat ahead of the concept understanding. The concept of resilience is rather complicated and deep in content as well as quite complex for an assessment and measurement. Nowadays, there is no universally agreed notion of resilience in the context of regional development as well as considerable ambiguity about what, precisely, is meant by the notion of regional economic resilience, about how it should be conceptualized There is still no one generally accepted methodology for how regional resilience should be measured, what its determinants are, and how it links to patterns of long-run regional growth. It leads to a certain misunderstanding and different variations in using of resilience concept.

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2.1 Literature review

Economic shocks occur periodically to economies, though the effect that these shocks have varies from region to region as does the region's adjustment and recovery to them. This study is particularly concerned with regional economic resilience: why are some regional economies that are adversely affected by shocks able to recover in a relatively short period of time while others are not? Economic resilience is a concept that is frequently used but rarely well defined. If it is to put the idea of resilience meaningfully to work in regional policy agendas and practices, then it is necessary to have a clear definition, conceptualization and understanding of precisely what it is. The first historically definition of resilience notion is found in Encyclopedia Britannica in 1824, where resilience is defined as the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress, or as the ability to recover from or adjust easily to misfortune or change. Resilience has roots in the Latin word resilio/resilire, meaning to jump back (Klein et al., 2003). The notion of resilience is broadly defined as a return to an original state. There is no universally agreed definition of regional economic resilience, different authors employ different definitions and descriptions, for more information see Table 1 containing a systematic literature review of this concept. Most of the works refer to resilience as the ability of any system to recover from an external shock or to absorb against downturns (Rose and Krausmann, 2013; Briguglio et al., 2009; Brock et al., 2002). Thereby, resilience includes the ability to deal with external factors and reduce vulnerability, and one of its main tasks is to minimize losses and as a result to ensure the economic recovery in the shortest terms. Resilience is seen as a property that is present (or absent) on a continuous basis and is about engaging and coping with change in general. Adaptation, on the other hand, is more episodic: i.e. handling a particular shock or disturbance. The difference between an actual process on the one hand (adaptation), and an underlying capacity on the other (resilience) is quite crucial, as the former can be observed from the alterations that take place, whereas the latter cannot, and can only be inferred from studying actual adaptation processes and then analysing the underlying factors that are important for successful adaptation.

The notion of resilience is commonly used to denote both strength and flexibility. Conceptually, there are two separate, though not necessarily unrelated, concepts. The first is based on equilibrium analysis in which resilience is the ability to return to a pre-existing state in a single equilibrium system. The second defines resilience in terms of complex adaptive systems and relates to the ability of a system to adapt and change in response to stresses and strains (Weir et al., 2012). The term implies both the ability to adjust to normal or anticipated levels of stress and to adapt to sudden shocks and extraordinary demands. For regional economic analysis, perhaps the most natural conceptual meaning of resilience is the ability of the regional economy to maintain or return to a pre-existing state (typically assumed to be an equilibrium state) in the presence of some type of exogenous shock. The idea of resilience is concerned with the extent to which regional or national economy is able to return to its previous level and/or growth rate of output, employment, or population after experiencing an external shock, see Feyrer et al. (2007) or Rose and Liao (2005). A related concept of resilience is the extent to which a regional economy avoids having its previous equilibrium state disrupted by an exogenous shock. This could involve avoiding the shock altogether (by having a regional economy that is not dependent on an industry that is likely to experience a negative demand shock) or withstanding the shock with little or no adverse impact (by having sufficiently diversified economy that the shock has little macroeconomic effect) as mentioned Melecký (2018). The study of resilience would then be the study of the rise, stability, and eventual decay of the institutions that underlie long-term regional economic growth. An economy would be resilient to the extent that its social structure was stable or to the extent that it was able to make a rapid transition from one structure to another (Simmie and Martin, 2010). Based on Martin (2012), regional resilience is a multi-dimensional property involving four interrelated dimensions describing respond to shock: resistance, recovery, re-orientation and renewal.

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Table 1. A literature review of resilience concept

Time	Authors	Understanding of resilience concept
2017	Brinkmann et al.	Economic resilience is the capability of a national economy to take preparatory crisis-management measures, mitigate the direct consequences of crises, and adapt to changing circumstances
2016	Hallegatte	Macroeconomic resilience as the ability of the economy to cope, recover, and reconstruct and therefore to minimize aggregate consumption losses. Macroeconomic resilience has two components: instantaneous resilience, which is the ability to limit the magnitude of immediate production losses for a given amount of asset losses, and dynamic resilience, which is the ability to reconstruct and recover.
2015	Martin and Sunley	Resilience refers to a capacity to withstand or recover from the market, competitive and environmental shocks.
2012	Martin	The capacity of the regional economy to reconfigure, that is adapted, its structure (firms, industries, technologies and institutions) so as to maintain an acceptable growth path in output, employment and wealth over time.
2010	Gunderson et al.	The resilience concept does not necessarily imply a return to the pre-existing state but could be referred to as the capacity to respond to opportunities which arise as a result of the change.
2009	Rose	The process by which a community develops and efficiently implements its capacity to absorb an initial shock through mitigation and to respond and adapt afterwards so as to maintain function and hasten recovery, as well as to be in a better position to reduce losses from future disasters.
2008	Cutter et al.	Resilience is the ability of the social system to respond and recover from disasters and includes those inherent conditions that allow the system to absorb impacts and cope with an event, as well as post-event, adaptive processes that facilitate the ability of the social system to reorganize, change, and learn in response to a threat.
2008	Hill et al.	The ability of the regional economy to maintain a pre-existing state in the presence of some type of exogenous shock; the extent to which a regional or national economy that has experienced an external shock is able to return to its previous level and/or growth rate of output, employment or population.
2008	Norris et al.	Process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance.
2006	Foster	The ability of the region to prevent, prepare, respond and 'recover' after a disturbance so as not to stand this obstacle to its development.
2006	Perrings	The ability of the system to withstand either market or environmental shocks without losing the capacity to allocate resources efficiently
2004	Coles et al.	A community's capacities, skills, and knowledge that allow it to participate fully in recovery from disasters.
2004	Walker	The capacity of a system to absorb disturbance and reorganize while undergoing a change so as to still retain essentially the same function, structure, identity, and feedbacks.
2003	Bruneau et al.	The ability of the system to reduce the chances of shock, to absorb shock if it occurs (abrupt reduction of performance) and to recover quickly after a shock (re-establish normal performance).
2001	Carpenter et al.	The adaptive capacity that allows for continuous development like a dynamic interplay between sustaining and developing with change.
1997	Reich	The structure of relationships among macroeconomic variables that persists over a long period of time and the economic, political, and social institutions that condition this structure.
1973	Holling	The amount of disturbance that ecosystem could withstand without changing self-organized processes and structures, defined as alternative stable states, i.e. measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables.
1958	Elton	Resilience as the amplitude of changes brought about by disturbance and by dynamics of post-disturbance recovery.
1824	Encyclopædia Britannica	Resilience is defined as the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress, or ability to recover from or adjust easily to misfortune or change.

Source: own elaboration, 2018

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2.2   The social dimension of resilience

Resilience is more than being ready for long-term threats. It indicates that a system can recover to some workable point despite changes and hardships. Resilience suggests that economic prosperity is more likely in diversified economies. From a local development perspective, economic development can be pathological if the economic change erodes the community base or increases the vulnerability to macroeconomic fluctuations. Development programs must be designed to harbour the core community values while offering new economic opportunities. Attention to resilience in economic development planning can preserve the region's economic and social integrity because it generates sustainable development that is resistant to social degradation as well as insulated from macroeconomic fluctuations. Briguglio et al. (2009) argue that policies contributing to greater macroeconomic stability, microeconomic market efficiency, good governance and social protection underpin economic resilience. Many politicians and economists believe that economic growth replaces or diminishes the need for social policies. However, the economic growth over the last decades has been accompanied by an increase in inequalities in many countries, see Dvoroková (2016). Inequalities threaten social cohesion and they threaten growth. If such concerns are correct, it is essential not only to build institutional structures but also to map social inequalities. The low growth performance over the recent decades has increased concerns regarding an increasing economic dispersion, income inequality at large, and social exclusion. Recent research works have stimulated fierce debate on inequality among academics and policymakers. The recent economic crisis revealed many of the weaknesses of the current economic policies, not least at the level of its fiscal policy, monetary policy, industrial policy, and social policy, and its inability to address problems related to inequality.

Inequalities have been the object of extensive research over the last decade. The level of social inequalities belongs to important indicators influencing the socio-economic development and other processes taking place in the social and economic realm. Facilitating rational income distribution and reducing poverty are mentioned among the main goals of public policy. It should be mentioned that such multidimensional phenomena as income disparity and poverty might be analysed from many different perspectives, including the national and international (Turečková and Buryová, 2016). Striving for fairness in economic development is crucial in order for societies to be stable and citizens not to feel disenchanted. The economic crisis has put inequalities high on the political agenda and made this an issue of serious public concern. In line with exogenous economic shocks and inequalities, a new dimension of resilience in popular nowadays, i.e. social resilience. Over the last decade, a growing body of literature has emerged which is concerned with the question of what form a promising concept of social resilience might take. Social resilience is about social entities and their abilities to tolerate, absorb, cope with and adjust to environmental and social threats of various kinds. The development of the concept of social resilience started with a rather unspecific understanding of social resilience as the capacity to respond, which then evolved to incorporate notions of learning and adaptation to form a composite definition, which includes the acknowledgement of the importance of the roles played by power, politics, and participation in the context of increasing uncertainty and surprise. As suggest Keck and Sakdapolrak (2013), social resilience has the potential to be crafted into a coherent analytic framework that can build on scientific knowledge from the established concept of social vulnerability, and offer a fresh perspective on today's challenges of global change. Based on a critical review of the recently published literature on the issue, we propose to define social resilience as being comprised of three dimensions: 1) Coping capacities –the ability of social actors to cope with and overcome all kinds of adversities; 2) Adaptive capacities – their ability to learn from past experiences and adjust themselves to future challenges in their everyday lives; 3) Transformative capacities – their ability to craft sets of institutions that foster individual welfare and sustainable societal robustness towards future crises.

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3   Methodological approach in the form of composite indices

Attempts at measuring the development process have made use of CIs. In recent years, international organizations, think-tanks, and the social sciences have contributed to a dramatic expansion in the range of CIs measuring concepts such as human development, governance, or social capital. CI is the mathematical combination of individual indicators that represent different dimensions of a concept whose description is the objective of the analysis (Saisana and Tarantola, 2002). CIs comparing territorial (e.g. country, region, city or local municipality) performance are increasingly recognised as a useful tool in policy analysis and public communication and very common for benchmarking the mutual and relative progress of territories in a variety of policy domains. CIs as a tool for a ranking become more and more popular because they illustrate a comprehensive view of a phenomenon that cannot be captured by only one single indicator. CIs provide simple comparisons of territories that can be used to illustrate complex and elusive issues in wide-ranging fields. It often seems easier for the general public to interpret CIs than to identify common trends across many separate indicators and CIs have also proven useful in benchmarking territorial performance. This reflects a growing recognition of the important role that CIs can play as a tool for evaluating trends in the level of territorial development and for assessing the impact of policy on well-being. It would point that CIs should never be seen as a goal per se. They should be seen, instead, as a starting point for initiating discussion and attracting public interest and concern. In fact, CIs must be seen as a means of initiating discussion and stimulating public interest. Many scientists dispute the use of CIs that lead to the determination of a single value for each geographic area, preferring the so-called dashboard. In the case of the dashboard, it is possible to identify various dimensions of the phenomenon, all relevant, without that they are further aggregated. From the statistical point of view, it is an incontrovertible choice but from the standpoint of political and media is a heavy limitation.

3.1   Review of existing composite indices

Measurement of the progress which societies have made in their developmental efforts has proven to be difficult but also very popular. However, CIs can send misleading policy messages if they are poorly constructed or misinterpreted. In fact, CIs must be seen as a means of initiating discussion and stimulating public interest. Literally, hundreds of sets of CIs on economic and social well-being have been developed throughout the world. CIs are very common in the field of economics and are used in a variety of policy domains such as national or regional competitiveness, sustainable development, quality of life assessment, globalisation and innovation (Huggins, 2003; Saisana and Tarantola, 2002). The proliferation of these indicators is a clear symptom of their political importance and operational relevance in decision-making processes. CIs are valued for their ability to integrate large amounts of information into easily understood formats for a general audience. Importance of CIs approach for the EU research is confirmed by the number of studies evaluated the level of development in specific thematic topic across the EU territory. Many more approaches evaluating the EU in terms of CIs exist, but they are not included in the evaluated sample (Table 2) with regard to their progress in terms of theory and empiricism, timeliness and validity, e.g. An Indicator for Measuring Regional Progress towards the Europe 2020 Targets (European Commission, 2014), The Regional Lisbon Index (European Commission, 2010), Synthetic index: Regional perspective on the Lisbon Agenda (European Commission, 2007). Staníčková, Melecký and Poledníková (2011) made a review of database analysis for exploration of EU cohesion and competitiveness, i.e. ones of the most common areas that are the subject of the EU evaluation and also the topics of CIs creation (Melecký, 2017; Poledníková and Melecký, 2017; Staníčková, 2018). There are also CIs which do not represent an official EU approach, however these CIs evaluate the territories in relevant topic, e.g. Social Progress Index (Porter, Stern and Green, 2016), Resilience Index Measurement and Analysis model (United Nations, 2016) or OECD approaches to quality of life and well-being evaluation (OECD, 2016, 2015), and others.

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Table. 2. Summary of the EU main composite indices

Authors	Year	Publication	Territory	Indicators
Annoni and Kozovska (EC - DG JRC)	2010	EU Regional Competitiveness Index 2010	268 EU27 NUTS 2 regions	RCI 2010 is composed of 69 indicators in 11 pillars: inputs (institutions, macroeconomic stability, infrastructure, health, quality of primary and secondary education, higher education/training and lifelong learning, technological readiness); outputs (labour market efficiency, market size, business sophistication, and innovation).
Annoni and Dijkstra (EC - DG JRC)	2013	EU Regional Competitiveness Index 2013	262 EU28 NUTS 2 regions	RCI 2013 has basically the same framework and structure of the 2010 edition. RCI 2013 is based on a set of 80 candidate indicators of which 73 have been eventually included in the index within the pillars.
Annoni, Dijkstra and Gargano (EC - DG RUP)	2017	EU Regional Competitiveness Index 2016	263 EU28 NUTS 2 regions	RCI 2016 has basically the same framework and structure of the 2010 and 2013 edition. RCI 2016 index is based on 74 mostly regional indicators in the same pillars.
Annoni, Dijkstra and Hellman (EC - DG RUP, Social Progress Imperative)	2016	EU Regional Social Progress Index	EU28 Member States (272 NUTS 2 regions)	Index is an aggregate index of 50 social and environmental indicators that capture 3 dimensions of social progress (Basic Human Needs, Foundations of Wellbeing, and Opportunity) and their underlying 12 components (nutrition and basic medical care, water and sanitation, shelter, personal safety, access to basic knowledge, access to information and communications, health and wellness, environmental quality, personal rights, personal freedom and choice, tolerance and inclusion, access to advanced education).
ESPON (European Spatial Planning Observatory Network)	2014	Economic Crisis: Resilience of Regions	EU27 Member States, Iceland, Liechtenstein, Norway, Switzerland.	Evaluation of regional resilience is based on 2 principal indicators: the number of persons employed and levels of economic output (GDP).
Grunfelder, Rispling and Norlen (Nordregio)	2016	Nordregio's New Regional Potential Index	Denmark, Finland, Iceland, Norway, Sweden, Faroe Islands, Greenland, Ålan	Criteria: Regional potential, Demographic potential, Labour market potential, Economic potential. Indicators: Population density, Net migration rate, Demographic dependency rate, Female ration, Employment rate, Share of the age group 25-64 with a high education degree, Youth employment rate, GRP/capita, Total R&D investments.
Domínguez-Torreiro (EC - DG JRC)	2016	Developing Regional Inclusive Society Index in EU	EU regional level	Dimensions for proposed indicators: Income distribution and well-being, Access to employment and good quality jobs, Access to knowledge, Access to health, Social protection performance, Social capital and governance, Vertical social mobility, Gender equality, Non-discrimination and tolerance, Personal security.
European Commission - DG RUP	2014	Regional Entrepreneurship Development Index	125 regions of 24 EU Member States	Index consists of 3 sub-indices (Entrepreneurial Attitudes, Entrepreneurial Abilities, and Entrepreneurial Aspirations), 14 pillars, and 28 variables.

Source: own elaboration based on reviewed references, 2018

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3.2 A step-by-step approach to creating the composite index

It is important to emphasize that the theoretical part (definition of the phenomenon and selection of the indicators) is not separate from the statistical-methodological part: so, the choice of the individual indicators is not independent of the choice of the aggregation method. No universal method exists for composite indices construction. In each case, their construction is much determined by the particular application, including both formal and heuristic elements, and incorporate some expert knowledge on the phenomenon. Nevertheless, the advantages of composite indices are clear, and they can be summarized in the unidimensional measurement of the phenomenon, an easy interpretation with respect to a battery of many individual indicators and simplification of the data analysis (e.g., ranking units and comparing their performance over time). The main factors to take into account in the choice of the method to be adopted for summarizing individual indicators are as follows (Mazziotta and Pareto, 2013): 1) type of indicators (substitutable/non-substitutable); 2) type of aggregation (simple/complex), 3) type of comparisons (absolute/relative); and last but not least, one of the most problematic parts in the process of creating the CIs, i.e. 4) type of weights (objective/subjective).

The literature on CIs is vast and almost every month new proposals are published on specific methodological aspects potentially relevant for the development of CIs. CIs are much like mathematical or computational models and, as such, their construction owes more to the craftsmanship of the modeller than to universally accept scientific rules for encoding. With regard to models, the justification for a CI lies in its fitness for the intended purpose and in peer acceptance. The quality of CI, as well as the soundness of the messages it conveys, depend not only on the methodology used in its construction but primarily on the quality of the framework and the data used. A composite based on a weak theoretical background or on soft data containing large measurement errors can lead to disputable policy messages, in spite of the use of the state-of-the-art methodology in its construction. CI construction is a complex task whose phases involve several alternatives and possibilities that affect the quality and the reliability of results. The main problems, in this approach, concern the choice of theoretical framework, the data availability, the selection of the more representative indicators and their treatment in order to compare and aggregate them. It is possible, shortly, to individuate the following steps to tackle (OECD, 2008). There is not always a 'well-established' solution, and sometimes it may be necessary to renounce to some requirements, to satisfy others. Following Figure 1 shows the flowchart for the choice of the 'best' method in constructing a CI, with the main possible solutions (normalization, weighting and aggregation) for each 'path' followed (assumptions and requirements). CI construction is not straightforward and the methodological challenges raise a series of technical issues that, if not addressed adequately, can lead to CIs being misinterpreted or manipulated. Therefore, careful attention needs to be given to their construction and subsequent use.

As is known, the implementation of a CI is a complex process that involves stages of work well defined, where the arbitrary choices of the researcher have a significant effect on the final results. The heated debate within the scientific community, over the years, seems to converge towards the idea that there is not a composite index universally valid for all areas of application, and, therefore, its validity depends on the strategic objectives of the research. Beyond the procedure of CI construction, CIs provide an irreplaceable contribution to simplification; however, they are based on methods that flatten the basic information and they can lead to a myopic reading of reality, especially if not sustained, upstream, from an adequate step of selection and interpretation of the individual indicators. Thus, it is considered absolutely essential, in order to obtain valid and reliable results, to support the process of choosing the set of the individual indicators with a theoretical framework that defines the social reality in each of its dimensions.
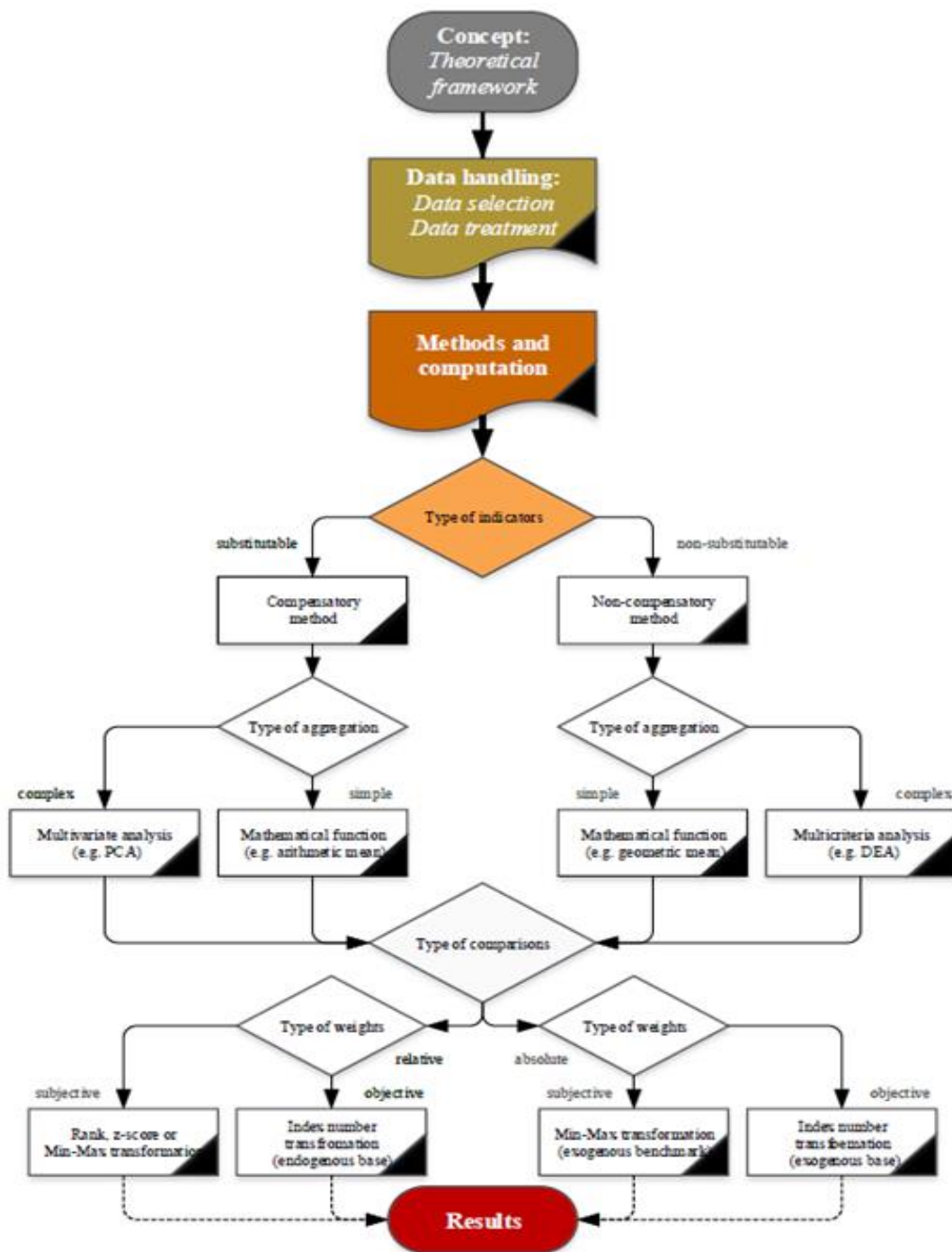
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Fig. 1. Flowchart for the choice of the 'best' method for construction of a composite index
(Source: Mazziotta and Pareto (2013, p. 74); own elaboration (2018))

4   Conclusion

Nowadays there are obvious changes (often exogenous in the form of economic shock or crisis) in modern society, social structure, territorial policy, public administration and other fields having an impact on the functioning and efficiency of the whole society, especially in terms of resilience and vulnerability of the economy. Despite the growing importance of resilience during the current period of global crisis, there is no generally accepted methodology for how the concept should be operationalized and measured empirically. Quantifying systems is a complex process, and scales for measuring resilience, at any level, do not currently exist.

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Only a thorough analysis involving multiple research dimensions from economic, environmental, institutional, social, and political studies may assure a conceptual definition and a reliable and relevant comprehensive analysis of resilience. This paper showed that CIs approach could be a perspective method for evaluation of resilience because there is no only one correct method how to create CI and thus CIs can be employed. The current practice of spatial planning pointed to the need to create a CI with which you can get a broader perspective on the territory.

The choice of methods mainly depends on the type of data. Different method suits different empirical case. In the case of many CIs, from analytical and statistical perspectives, it might be possible to improve the methods of aggregation and databases of relevant indicators, although it should be carefully evaluated whether the potential gains outweigh the additional uncertainty they might introduce. The quality of CI, as well as the soundness of the messages it conveys, depend not only on the methodology used in its construction but primarily on the quality of the framework and the data used. A composite based on a weak theoretical background or on soft data containing large measurement errors can lead to disputable policy messages, in spite of the use of the state-of-the-art methodology in its construction.

5 Acknowledgement

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CHINA´S COMPETITIVENESS: MYTH AND REALITY. ANALYSIS AND IMPLICATIONS IN COMPARISON WITH THE BIGGEST COMPETITORS OF WTO MEMBERS

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Abstract
The effect of openness, trade liberalisation on economic growth as well as relationships between economic growth and competitiveness remain highly contentious issues. Today's economic circumstances are full of challenges. China has come a long way since the 1978 election of President Deng Xiaoping heralded a new era of market-oriented reforms. Starting with the production of low-value, labour-intensive goods, Chinese companies have gradually progressed up the value-added ladder. China has successfully utilized foreign technologies and becomes a strong competitor to many industries in developed countries. China has the opportunity to be a global leader in a number of important areas that will be cornerstones of global growth in the next decades and this is also challenge as well as threat for its biggest competitors. The paper focuses on using Data Envelopment Analysis method for comparing the productivity level and efficiency changes of China with its biggest competitors, i.e. selected members of World Trade Organization. Applicability and efficacy of the suggested approach are illustrated by a real data set involving the factors of competitiveness based on Global Competitiveness Index in reference period of the 10[th] anniversary of the global financial crisis.

Keywords
China, Competitiveness, DEA, Efficiency change, GCI, Global financial crisis, Productivity, WEF.

JEL classification
C67, E60, F62, O11, O47

1   Introduction

Openness to trade, investment and even the movement of people is vital for prosperity, peace and individual freedom. And there have been few better moments in history to reconfirm the role of trade as central to global growth, job creation and development. Today's economic circumstances are full of challenges, especially after year 2007. Ten years ago, the *global financial crisis* interrupted a period of sustained economic growth dating back to the 1960s. Since then, despite unorthodox monetary policy and fiscal stimulus packages, advanced economies have experienced prolonged comparatively sluggish growth. In emerging markets, the impact of the global financial crisis was lessened in part by interest rate differentials, with advanced economies fuelling capital inflows in the form of foreign direct investment, the commodity super-boom, and – related to this – the rapid growth of China. The growth of Chinese economy has been tremendous. Only recently have advanced and emerging economies begun to show signs of recovery. These threats and opportunities have also intensified competition in global markets, which, in turn, implies a greater need to be competitive to generate additional market opportunities and economic links in the presence of many more participants vying for the same space. China has the opportunity to be a global leader in a number of important areas that will be cornerstones of global growth in the next decades and this is also challenge for its biggest competitors.

As we approach the 10[th] anniversary of the global financial crisis, the world economy is showing encouraging signs of recovery, with GDP growth accelerating to 3.5 % in 2017. Despite this positive development, leaders are facing major predicaments when it comes to economic policy. Uneven distribution of the benefits of economic progress, generational divides, rising income inequality in advanced economies, and increasing environmental degradation have heightened the sense that the economic policies of past years have not served citizens or society well. Coupled with growth rates that remain below historical levels, these quandaries put many prevalent models of economic growth and related policies into question. Major technological disruption and the new fault lines emerging in the global economic and political order add further uncertainty about the types of policies that will

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make economies future-proof. Taken together, all of these factors are challenging decision makers to find new approaches and policies to advance economic progress. Emerging consensus is that economic growth once again needs to focus more on human well-being. Such human-centric economic progress is multidimensional by nature – it is broad based by benefitting the vast majority of people, environmentally sustainable, and equitable in terms of creating opportunities for all and not disadvantaging future generations. Competitiveness remains an important contribution to the broader goal of human-centric economic progress by creating resources needed for increased well-being, including better education, health, security, and higher per capita income (WEF, 2017).

Conceptual part of the paper is based on approach of World Economic Forum (WEF) in the form of Global Competitiveness Index (GCI) tracking the performance of evaluated countries on 12 pillars of competitiveness. It assesses the factors and institutions identified by empirical and theoretical research as determining improvements in productivity, which in turn is the main determinant of long-term growth and an essential factor in economic growth and prosperity. Methodological part of the paper is based on efficiency measurement based on the last decade editions of GCI 2007-2017 ((including all the years inside this range) and using Output-Oriented Malmquist Productivity Index (OO MPI) in method of Data Envelopment Analysis (DEA). Geographical rank of the empirical analysis cover the biggest global economic powers such as BRICS countries (Brazil, Russia, India, China and South Africa), the European Union (EU) members and the EU28 as a whole, Japan and the United States of America (USA). Therefore, the aim of the paper is to propose DEA application in order to evaluate efficiency changes and to analyse a level of productivity depending on each country's competitiveness factors and compare them each other.

2   Literature review

In recent years, the topics about measuring and evaluating of *competitiveness* have enjoyed economic interest. Although there is no uniform definition and understanding of competitiveness, this concept remains one of the basic standards of performance evaluation and it is also seen as a reflection of success of area in a wider comparison. The need for a theoretical definition of competitiveness at macroeconomic level emerged with the development of globalization process in the world economy as a result of increased competition between countries. In order to understand what the competitiveness is in a national perspective, it is best way to look at definition given by the President's Commission on Industrial Competitiveness (1985): "Competitiveness is the degree to which a nation can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously maintaining or expanding the real incomes of its citizens." This is the most quoted definition in this area, and defines competitiveness from a macro perspective. Many writers (Barrell et al., 2000; Porter, 1998; Krugman, 1994) have also referred to this definition of competitiveness of nations. The definition points out that the ultimate goal of competitiveness is to maintain and increase the real income of its citizens, usually reflected in the standard of living of the country. From this perspective, the competitiveness of a nation is not an end but a means to an end; its ultimate goal is to increase the standard of living of a nation under free and fair market conditions (through foreign trade, production, and investment). It "refers to a country's ability to create, produce, distribute, and/or service products in international trade while earning rising returns on its resources" (Scroot and Lodge, 1985, p. 3). Arguably, national governments' principal goal is to establish an environment that fosters a high standard of living for its citizens by addressing health, safety, laws, and environmental issues. This goal can be achieved, in part, through effective management and allocation of resources for producing the highest attainable level of products. Therefore, it becomes imperative that governments coordinate a comprehensive approach towards trade and investment that incorporates a competition orientation (Feketekuty, 1996). Indeed, many nations are very cognizant of the fact that internal growth depends upon their ability to sustain trade and attract foreign investment (Fojtíková, 2013).

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The concept of international competitiveness of nations makes sense only within a national economic context. Nations adopt economic and trade policies that directly affect the ability of enterprises and industries engage in international trade and investment. This concept is thus often used in analysing countries' macroeconomic performance. It compares, for a country and its trading partners, a number of salient economic features that can help explain international trade trends. There have been several studies devoted to the competitiveness of international trade. Authors focus either on one particular country and its foreign relations, or discuss the situation of a certain union of countries with respect to its environment or the situation within it. In his book, The Competitive Advantage of Nations, Porter (1990, p. 19) observes that national competitiveness is measured by two sets of indicators: "(1) the presence of substantial and sustained exports to a wide array of other nations, and/or (2) significant outbound foreign investment based on skills and assets created in the home country". He notes that the competitive advantage of nations is determined by the strength of their factor endowments; their demand conditions; the competitiveness of firm strategies, structures, and rivalries in major industries; and the strength and diversity of related and supporting industries.

It should be emphasized here that openness to global markets and the internationalization of economies play an increasing role in productivity and competitiveness enhancement (Fojtíková and Staníčková, 2017). Competitiveness is one of the fundamental criteria for evaluating *performance* and reflects the success of area. Territories need highly performing units in order to meet their goals, to deliver the products and services they specialised in, and finally to achieve competitive advantage. Differences in performance across territories are seen by government as important policy targets. Comparative analysis of performance in public sector is thus starting point for studying the role of efficiency and effectiveness, i.e. two aspects of performance regarding economic governance of resources utilization by public management for achieving medium/long-term objectives of economic recovery and sustainable development of national economies (Mihaiu et al., 2010). Increasing productivity is generally considered to be the only sustainable way of improving living standards in the long term. Statistical evidence to help policy makers understand the routes to productivity growth, especially those which can be influenced by government, can help lead to better policy. Based on Porter (1990), competitiveness is usually linked to productivity. Fig. 1 illustrates conceptual framework of *efficiency* (inputs-outputs) and *effectiveness* (outputs-outcomes). Efficiency can be achieved under conditions of maximising results of an action in relation to resources used, and it is calculated by comparing effects obtained in their efforts. In a competitive economy, issue of efficiency can be solved by comparing these economic issues. Effectiveness is more difficult to assess than efficiency since outcome is influenced by political choice and linked to welfare objectives.
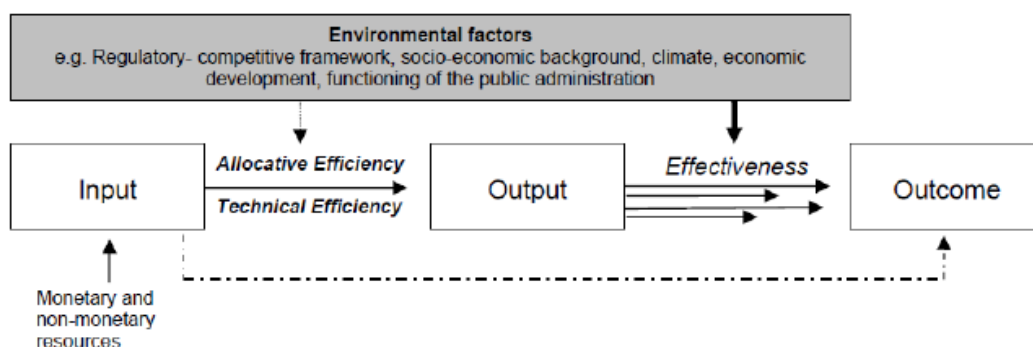

Fig. 1. Efficiency and effectiveness concepts (Source: Mandl et al., 2008)

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3   Methodology and data

Considering the increasing growth and importance of organization in the society and presence in a competitive world, evaluation of performance of areas has been remarkably considered and various measures are brought up as a criterion for evaluation of counties' performance.

3.1   Concept and dataset

Macroeconomic competitiveness is monitored by many institutions, however, two well-known international institutes, i.e. *Institute for Management Development* (IMD) and *World Economic Forum* (WEF) publish most reputable competitiveness reports. To compare a level of competitiveness in the paper, database performed by WEF is used. The first reason for choosing WEF approach is its long-term continuity and international recognition of stakeholders. Since 1979, WEF publishes *Global Competitiveness Report* (GCR) that produces annual *Global Competitiveness Index* (GCI) to rank national economies. By benchmarking each year's progress on different factors and institutions that matter for future growth, GCR keeps competitiveness on the public agenda, provides a focal point for the discussion of long-term competitiveness policies, and helps to keep stakeholders accountable (WEF, 2017).

The second reason for choosing WEF is its approach to perceiving competitiveness and suitability in terms of used quantitative method. In GCR, WEF defines competitiveness as the set of institutions, policies, and factors that determine *level of productivity of a country*. Level of productivity, in turn, sets level of prosperity that can be reached by an economy. Level of productivity also determines the rates of return obtained by investments in an economy, which in turn are the fundamental drivers of its growth rates. This open-endedness is captured within GCI by including a weighted average of many different components, each measuring a different aspect of competitiveness. Components are grouped into 12 categories, the pillars of competitiveness, which are not independent, they tend to reinforce each other, and a weakness in one area often has a negative impact on others (see Table 1, WEF, 2017). GCI pillars may be grouped according to the different dimensions (input vs. output) of competitiveness they describe. Terms '*inputs*' and '*outputs*' are meant to classify pillars into those which describe driving forces of competitiveness and those which are direct or indirect outputs of a competitive society and economy. It is not easy to make a decision on which GCI pillars are economic drivers of competitiveness and which are results of activities in the economy. For this purpose is applied the classification based on the *EU Regional Competitiveness Index* (RCI) – concept created partly in line with GCI (Annoni and Kozovska, 2010), see Table 1.

3.2   Methodological background

The main element of the paper is competitiveness at the centre of which is *productivity – the efficiency with which an economy uses available inputs to produce outputs*. In view of this, a suitable method for empirical analysis is *Data Envelopment Analysis* (DEA). DEA was first proposed by Charnes, Cooper and Rhodes – CCR model (1978). DEA is multicriteria decision-making method and one of mathematical approaches for providing a relative efficiency assessment of a set of peer entities called *Decision Making Units* (DMUs), but their definition is generic and flexible. DEA is convenient to determine the efficiency of DMU, which are mutually comparable – using the same inputs, producing the same outputs, but their performances are different. Several DEA methods exist for measuring territorial efficiency and competitiveness, besides the basic DEA models, certain modifications exist (e.g. Melecký, 2018; Hančlová and Melecký, 2016). Recently, research effort has focused on an investigation of the causes of productivity change and its decomposition. *Malmquist Productivity Index* (MPI) become the standard approach in productivity measurement over time in the non-parametric research in consumer-production context. MPI has been introduced by Caves, Christensen and Diewert (1982), and enjoyed widespread use in territorial analysis (e.g. Staníčková, 2017).

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In contrast to traditional DEA models which measure efficiency of a DMU, MPI enables to measure productivity change of a DMU between two time periods, t and $t+1$. MPI is defined as product of Catch-up and Frontier-shift terms. Catch-up or better Efficiency change term deals with degree to which a DMU improves or worsens its efficiency – technical efficiency change. Frontier-shift term shows change in efficient frontiers between two time periods – technological efficiency change. With respect to paper topic of competitiveness and orientation of policy-makers to objectives on this concept, it is used output orientation of model, i.e. OO MPI measuring efficiency change in production units between successive periods t and $t+1$ is formulated via (1):

$$MPI_q\left(x_q^{t+1}, y_q^{t+1}, x_q^t, y_q^t\right) = E_q \cdot P_q,$$
(1)

where x_q represent inputs and y_q represent outputs of evaluated DMU_q in periods t and $t+1$; E_q is change in relative efficiency of DMU_q in relation to other units (i.e. due to production possibility frontier) between time periods t and $t+1$; P_q describes the change in the production possibility frontier as a result of the technology development between time periods t and $t+1$. Components E_q and P_q are defined via (2) and (3) (Cooper, Seiford, Tone, 2007):

$$E_q = \frac{\phi_q^{t+1}\left(x_q^{t+1}, y_q^{t+1}\right)}{\phi_q^t\left(x_q^t, y_q^t\right)},$$
(2)

$$P_q = \left[\frac{\phi_q^t\left(x_q^{t+1}, y_q^{t+1}\right)}{\phi_q^{t+1}\left(x_q^{t+1}, y_q^{t+1}\right)} \cdot \frac{\phi_q^t\left(x_q^t, y_q^t\right)}{\phi_q^{t+1}\left(x_q^t, y_q^t\right)}\right]^{1/2},$$
(3)

where the optimum value of variable ϕ_q expresses the need for proportional increase of outputs to achieve DMU_q efficiency in time t and $t+1$ corresponding to inputs x_q and outputs y_q of the given period. By modification of equations (2) and (3), following MPI_q equation (4) makes possible to measure change in technical efficiency and movement of frontier in terms of a specific DMU_q between periods t and $t+1$ (Färe et al., 1994):

$$MPI_q = \frac{\phi_q^{t+1}\left(x_q^{t+1}, y_q^{t+1}\right)}{\phi_q^t\left(x_q^t, y_q^t\right)}\left[\frac{\phi_q^t\left(x_q^{t+1}, y_q^{t+1}\right)}{\phi_q^{t+1}\left(x_q^{t+1}, y_q^{t+1}\right)} \cdot \frac{\phi_q^t\left(x_q^t, y_q^t\right)}{\phi_q^{t+1}\left(x_q^t, y_q^t\right)}\right]^{1/2} = ECH_q \cdot FS_q.$$
(4)

The first term E_q on the right-hand side measures the magnitude of technical efficiency change (ECH) between time periods t and $t+1$. The second term P_q measures shift in possibility frontier, i.e. technology frontier shift (FS), between time periods t and $t+1$. As a result, $MPI_q < 1$ indicates deterioration in productivity of DMU_o from Period 1 to Period 2; result of $MPI_q = 1$ shows there is no change in productivity and $MPI_q > 1$ shows progress in productivity (Cooper et al., 2007).

Suppose there are n DMUs which consume m inputs to produce s outputs. If a performance measure (input/output) is added or deleted from consideration, it will influence the relative efficiencies. Empirically, when the number of performance measures is high in comparison with the number of DMUs, then most of DMUs are evaluated efficiently. Hence, the obtained results are not reliable. There is a rough rule of thumb (Cooper et al., 2007) which expresses the relation between the number of DMUs and the number of performance measures as follows (5):

$$n \geq 3(m + s).$$
(5)

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In the paper, the rule of thumb is met, because number of DMUs equals to sum of input and outputs, i.e. $36 \geq 3 (6 + 6)$, $36 \geq 3 (12)$, $36 \geq 36$. ArcGIS 10.6 version, DEA Frontier Add-In, and IBM SPSS Statistics 25 version are software used for the calculations.

Territorial aspect of analysis is dedicated to current global economic powers, i.e. BRICS countries, the EU members and the EU28 as a whole, and other countries from the triad to the EU, i.e. Japan and the USA. Importance of these global economic powers cannot be denied for their role in organisation of current international relations during the period of globalisation. This fact relates closely to the issue of international competitiveness and influence of these leaders on international market and business conditions. Balance of traditional world powers is thus changing and powers of the triad, i.e. the EU, Japan and the USA powers are being promoted by BRICS countries. Countries like China, India, Brazil or Russia are heard more and more often and in different contexts. The most obvious case if changed position of China. Japan has ceased to be the largest Asian economy and replaced by China. The country of rising sun in Asia is increasingly retreating. On the contrary, the '*soft*' or cultural power, or '*hard*' or economic power of China, is constantly growing. One thing is certain, distribution of powers and players on the world stage change. But what is relationship among global economic powers in challenging competitive environment?

Indicators represent GCI pillars are crucial for evaluation of relationships among global economic powers via OO MPI. GCI pillars represent both sides of required indicators, i.e. input and output size. Indicators come from WEF database (WEF, 2018). Table 1 includes division of 12 GCI pillars in six inputs and six outputs, in line with time-series of analysis, i.e. years within period 2007-2017. Time period of analysis includes periods of growth dynamics and further enlargement of the EU, periods of economic downturn and stagnation, effects of the economic crisis and subsequent stagnation can be considered as the other milestones. In DEA analysis, calculations were made for year-on-year productivity changes between all years of period 2007-2017, i.e. dynamically across time.

Table 1. Background of empirical analysis

GCI pillars – Inputs (I 1-6)	DMUs	GCI pillars – Outputs (O 1-6)
Institutions, Infrastructure, Macroeconomic environment, Health and primary education, Higher education and training, Technological readiness	Global economic powers, i.e. 36 economic entities	Goods market efficiency, Labour market efficiency, Financial market development, Market size, Business sophistication, Innovation
	Time-series	
GCI editions	Annual changes	Total period change
11 editions from GCR 2007-2008 to GCR 2017-2018	2007-2008, …, 2016-2017	Total changes across years in reference period 2007-2017

Source: own elaboration, 2018.

4 Empirical results

The aim of evaluation of the areas' operation is correction, improvement and promotion of performance. Evaluation and comparison performance of similar units is an important part of the complex organisation' management. DEA is one of the power management techniques empowering to estimate territorial performance in comparison with other competitors and make the decision for a better future. Performance is a major prerequisite for future development and success in broader comparison. In the paper, comparison of one dimension of performance is processed, i.e. partial efficiency changes and total productivity changes. Table 1 in Appendix A presents year-on-year efficiency changes gained by OO MPI for the whole reference period 2007-2017. Table 1 in Appendix A also shows reordered countries from the best to the worst, OO MPI scores and corresponding ranks. Results of traditional triad (EU -Japan-USA) mark bold font and dark grey colour, results of BRICS group mark italic font and light grey colour. Based OO MPI scores, total productivity change ranges

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from 1.009 – the 1st position (Cyprus) to 0.974 – the last 36th position (Romania). Twelve countries recorded slowly positive and increasing trend in productivity change during the whole reference period (behind Cyprus, Greece, Slovenia, Spain, Denmark, Portugal, Finland, Netherlands, Hungary, Belgium, EU28 and France placed). Nineteen countries achieved slowly negative and decreasing trend productivity change during the whole reference period (prior to Romania, placed Sweden, United States, Lithuania, Austria, Slovakia, Czech Republic, Estonia, Japan, Germany, Croatia, India, Latvia, Brazil, China, South Africa, Poland, Bulgaria and Russia). Five countries recorded unchanging trend in productivity change during the whole reference period (Italy, United Kingdom, Luxembourg, Ireland and Malta). Differences in OO MPI scores are not large both in the case of efficient and inefficient countries. Average total change in productivity of triad countries achieves 0.998 and BRICS countries 0.984. Results thus confirm the constantly strong position of triad, but also the growing tendency BRICS performance.

Development potentials or weaknesses are inherent in the national diversity. Part of explanation of DEA efficiency results has to do with differences in competitiveness. Broader aspects enter into the overall evaluation of economics and these aspects are unnoticeable for DEA, i.e. part of qualitative evaluation in line with evaluation of overall performance. What does it mean for efficiency? In the paper, DEA results efficiency are different from GCI results competitiveness. Why? Is a high level of competitiveness necessarily associated with a high level of efficiency and vice versa? It may not always be the case of evaluated countries. Concordance of results, in GCR, e.g. country achieves lower GCI score, and in DEA higher MPI score and seems to operate more efficiently in the reference period (e.g. CY, GR and PT). Such conclusion is relevant by comparing values of inputs and outputs in DEA, and the fact that outputs are achieved with given inputs. If input-output ratio is low on both sides, countries could be considered as efficient in transformation process. These results are not linked with overall competitiveness evaluation which does not depend primarily on efficiency, but on effectiveness of whole economic processes (see Fig. 1). Broader aspects enter into the overall evaluation of economics and these aspects are unnoticeable for DEA, i.e. issue of effectiveness.

5   Conclusion

Competitiveness of economies in integrated world determines how well they convert the potential created by access to global markets into opportunities for their economic subjects. The world economy is changing in the face of growing competition as consequence of globalisation processes. These processes result in changing position of global economic powers, emergence of new powers, and thus in new distribution of global forces. It leads to importance of deeper study of factors affecting competitiveness and influencing the growth with respect to competitors and market players. In this connection, the EU Communication called Global Europe: Competing in the World (EC, 2006, p. 20) is the initial idea for the further research: "*China is the biggest single challenge of globalisation in the trade field and a test for our capacity to make globalisation an opportunity for jobs and growth.*" It is obvious the continuity of the EU's growth strategies (the earlier Lisbon Strategy, the current Europe 2020 Strategy). China may soon become the world´s largest economy. Rather, China will recognize that it will need to further develop interdependence with other countries in order to achieve economic growth and keep economic dynamism. Enhanced Chinese interactions with the key World Trade Organization (WTO) actors thus are crucial for upgrading the capabilities of Chinese economy when China faces new competitive challenges from its followers in the developing world. Markets provided by developed countries will be more important for Chinese national companies (MacGregor Pelikánová, 2017).

As part of the follow-up research, the aim will be to assess development of China and its comparison with all global economic powers being part of WTO. Due to the interconnectedness of world economies as a result of globalisation processes, it is desirable to analyse competitiveness of these entities not only for economic objectives but the other aspects. Competitiveness is multifactor conditional, it is necessary to include social, environmental, institutional, etc. aspects. Also, stage of

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economic development plays key role in strengthening of competitiveness. WEF applied this concept of Michael Porter (1990) for competitiveness evaluation of countries in GCR too. Each stage of development (economy is driven by productive factors, investment-driven economy, and innovation-driven economy) corresponds to another type of competitive advantage, i.e. generally cost-effective or qualitative one.

Competitive advantage is related to ability of economy to compete, and also with needs of economy for concrete measures to improve its position – this differs naturally across stages of economic development. For example, China mentioned in the EU Communication (EC, 2006) as country that is currently the biggest opportunity, challenge and also threat. China faces great challenges in terms of addressing socially and environmentally friendly issues in terms of competitiveness and international trade relations. This fact is in line with its stage of economic development and corresponding competitive advantages. Follow-up research will orientate on input factors, i.e. driven forces of competitiveness of countries in international comparison and analysis of their competitive dis/advantages.

6   Acknowledgement

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Appendix A

Table 1. OO MPI results for reference period 2007-2017 – the 10th anniversary of the global financial crisis

Country	*Output-Oriented Malmquist Productivity Index – annual changes and overall-time change*											*Final ranking*		
	2007-2008	*2008-2009*	*2009-2010*	*2010-2011*	*2011-2012*	*2012-2013*	*2013-2014*	*2014-2015*	*2015-2016*	*2016-2017*	*Total change*	*Rank*	*Code*	*Total change*
Austria	1.000	0.977	0.953	1.012	1.029	0.979	0.988	1.002	1.000	1.018	0.996	1	CY	1.009
Belgium	0.966	1.026	1.005	0.970	1.029	0.989	1.003	0.999	1.013	1.012	1.001	2	GR	1.008
Brazil	0.980	0.992	0.935	0.983	0.988	0.982	1.000	1.024	0.998	0.987	0.987	3	SI	1.007
Bulgaria	0.992	1.009	0.892	0.996	0.982	0.972	0.984	0.989	1.007	0.969	0.979	4	ES	1.005
China	**0.933**	**0.996**	**0.978**	**0.985**	**1.010**	**1.018**	**0.971**	**1.002**	**0.968**	**0.982**	**0.984**	5	DK	1.004
Croatia	0.974	0.971	0.951	1.007	1.023	0.990	1.017	0.997	0.995	0.991	0.992	6	PT	1.003
Cyprus	0.996	1.003	1.060	0.963	1.083	1.016	1.048	0.939	1.024	0.954	1.009	7	FI	1.002
Czech Republic	0.998	1.011	0.956	1.022	0.983	0.989	0.981	0.973	1.001	1.026	0.994	8	NL	1.002
Denmark	1.011	1.012	0.998	1.003	0.999	0.996	0.984	1.023	0.995	1.020	1.004	9	HU	1.002
Estonia	0.993	1.024	0.951	1.010	1.040	0.986	0.969	0.992	0.986	0.982	0.993	10	BE	1.001
Finland	0.973	0.990	1.040	1.009	0.999	1.010	0.989	1.009	1.013	0.987	1.002	**11**	**EU**	**1.001**
France	0.987	1.017	0.946	1.069	1.008	0.957	1.018	1.005	0.994	1.007	1.001	12	FR	1.001
Germany	0.977	1.001	0.953	0.985	0.998	1.009	0.993	1.007	0.999	1.001	0.992	13	IT	1.000
Greece	1.012	1.022	1.006	1.038	1.184	0.918	0.981	0.988	1.039	0.892	1.008	14	UK	1.000
Hungary	0.995	0.995	0.978	1.010	1.009	0.993	1.009	1.006	1.037	0.982	1.001	15	LU	1.000
India	0.980	1.004	0.950	1.009	0.998	1.005	1.031	0.969	0.984	0.981	0.991	16	IE	1.000
Ireland	0.986	1.016	0.984	1.013	1.115	0.975	1.020	0.945	0.976	0.968	1.000	17	MT	1.000
Italy	1.006	1.039	0.938	1.001	0.993	0.997	1.035	0.998	0.992	1.004	1.000	18	SE	0.999
Japan	0.988	1.037	1.008	0.985	1.018	1.002	1.008	0.973	0.939	0.975	0.993	**19**	**USA**	**0.999**
Latvia	1.013	1.037	0.965	1.001	0.992	0.967	0.966	0.996	0.982	0.989	0.991	20	LT	0.997
Lithuania	0.987	1.006	0.977	1.002	1.004	0.990	1.012	1.002	0.992	0.997	0.997	21	AT	0.996
Luxembourg	0.971	1.005	0.995	0.981	1.010	0.977	1.013	1.016	1.023	1.008	1.000	22	SK	0.995
Malta	0.977	1.039	0.951	0.960	1.043	1.017	1.000	0.975	1.011	1.023	1.000	23	CZ	0.994
Netherlands	1.024	1.000	0.970	0.992	1.023	0.981	1.004	1.005	1.005	1.012	1.002	24	EE	0.993
Poland	1.017	1.016	0.857	0.975	1.006	0.959	0.996	0.966	1.013	0.987	0.979	**25**	**JP**	**0.993**
Portugal	0.983	1.009	1.004	1.007	1.010	0.986	1.062	1.015	1.003	0.956	1.003	26	DE	0.992
Romania	1.017	0.998	0.847	0.986	1.011	0.979	0.971	1.006	0.977	0.947	0.974	27	HR	0.992
Russian Federation	0.948	0.997	0.950	0.990	0.949	0.980	0.980	1.011	0.993	0.948	0.975	28	*IND*	*0.991*
Slovak Republic	1.004	1.002	0.959	1.015	0.991	1.021	0.992	0.972	1.006	0.989	0.995	29	LV	0.991
Slovenia	0.979	1.011	1.006	0.984	1.038	0.982	1.068	1.006	0.987	1.009	1.007	*30*	*BR*	*0.987*
South Africa	1.006	1.050	0.929	1.015	1.009	1.028	0.947	0.915	0.999	0.934	0.983	*31*	*CN*	*0.984*
Spain	0.989	1.013	0.960	1.002	1.049	1.016	1.041	0.984	0.979	1.014	1.005	*32*	*ZA*	*0.983*
Sweden	0.985	0.989	1.010	1.029	0.970	0.992	1.001	1.004	1.007	1.006	0.999	33	PL	0.979
United Kingdom	0.969	1.005	0.976	1.014	1.089	0.999	0.978	0.989	0.998	0.986	1.000	34	BG	0.979
United States	0.983	1.052	0.987	0.991	1.028	1.003	1.001	0.970	0.973	1.004	0.999	35	*RU*	*0.975*
European Union	0.993	1.012	0.978	1.001	1.018	0.994	1.015	0.997	1.003	0.997	1.001	36	RO	0.974
MIN	0.933	0.971	0.847	0.960	0.949	0.918	0.947	0.915	0.939	0.892	0.974			
MAX	1.024	1.052	1.060	1.069	1.184	1.028	1.068	1.024	1.039	1.026	1.009			

Source: own elaboration, 2018.

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FISCAL FEDERALISM AND DECENTRALIZATION IN SELECTED EU COUNTRIES

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Abstract
The aim of the paper is to provide an empirical evidence of fiscal decentralization and fiscal federalism in selected EU countries in the period 1995-2016. The selected countries, namely the Czechia, Estonia, Finland, Italy and Spain, are compared in term of fiscal fragmentation and decentralization applying following indicators: total, vertical and horizontal fragmentation, and expenditure, revenue and tax decentralization. Results suggest that the Czechia is the most fragmented and Finland is the most defragmented country in the sample. The analysis shows that though the expenditure decentralization in EU countries is quite high, the degree of revenue decentralization is low, the difference is about 13 percentage points. Finland and Spain report the highest decentralization and the widest SNGs responsibilities, followed by Italy. On the other hand, the Czechia is the most centralized country. Estonia embarked the most striking centralization process and considerable changes in revenue and taxation powers.

Keywords
Fiscal decentralization, Fiscal federalism, Subnational governments, Territorial fragmentation.

JEL classification
H77, H11, H83, E62.

1   Introduction

Fiscal decentralization is usually defined as a shift of decision - making power to sub-national governments (SNGs). Its importance started to be highlighted in the 1970´s following the introduction of initial papers of Tiebout (1956) or Oates (1972) into the public finance theory. According to Rodríguez-Pose and Krøijer (2009) a top-down processes of decentralization are usually characterized by a division of powers combined with limited shift of the resources to lower government levels. Many studies highlight the theoretical prediction that fiscal decentralization enhances the efficiency of government and promotes economic development. Anyway, EU countries applied different approaches in term of government territorial fragmentation, SNGs competency and funding. It is necessary to have on mind these variations in future plans connected with a deeper fiscal cooperation in the EU. That´s why the aim of paper is to provide an empirical evidence of fiscal decentralization and fiscal federalism in selected EU countries in the period 1995-2016. The selected countries are compared in term of fiscal fragmentation and decentralization ratios. Countries under examination, namely the Czechia, Estonia, Finland, Italy and Spain, are chosen with the intention to demonstrate a divergence between EU countries.

The paper is organized as follows. The first chapter brings theoretical background and literature review of fiscal federalism and decentralization. The second chapter introduces used methods and data. The third chapter focuses on comparing a fiscal fragmentation and the degree of decentralization using decentralization rations. Conclusion summaries main findings.

2   Literature review

According to Pfaundler (1931) fiscal federalism can be described as the whole complex of arrangements and facts that treats the financial relations between the main state and its integrated political subdivisions and, in addition, the relations between the political subdivisions. Basic requirement for fiscal federalism is that some of the political subdivisions obtain the resources needed for various (public) goods through taxes.

The relations which are formed through fiscal federalism arise in groups which are arranged in subordinated order, which is also called vertical fiscal federalism and/or in groups which are arranged

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in horizontal direction (horizontal fiscal federalism). International comparison is ofren based on territorial fragmentation (total, vertical and horizontal).

Traditional theory of fiscal federalism is mostly based on Oates's (1972) theorem, which predicts a greater allocative efficiency and also production efficiency. An important extension of literature brings "second-generation" of fiscal federalism (e.g. Oates, 2005) which takes into account political and fiscal institutions, imperfect information and political agents.

Following Golem (2010), fiscal decentralization in its purest form, implicates that sub-national governmental units have the autonomy over financing and provision of public goods and services. In such a system, the sub-national governments control their own budget without any intervention from the central government. Marlow (1988, p.262) defines and measures the extent of decentralization as the *"ratio of state and local government expenditures-to-total government expenditure"*. Opposite, fiscal centralization assumes that financing and provision of public goods is exclusively dictated by the national governments. Fiscal decentralization is closely relative to tax autonomy, which captures various aspects of the freedom sub-central governments (SCGs) have over their own taxes. As OECD (1999) notes it encompasses features such as sub-central government's right to introduce or to abolish a tax, to set tax rates, to define the tax base, or to grant tax allowances or reliefs to individuals and firms. The wealth of explicit and implicit institutional arrangements has to be encompassed by a set of indicators that are simultaneously appropriate (they capture the relevant aspects of tax autonomy), accurate (they measure those aspects correctly) and reliable (the indicator set remains stable over time).

Generally, fiscal decentralization is linked to sharing of fiscal responsibilities and power among central, state and local governments, but the term is not sufficiently clear even in the fields of political science or public administration. Most authors agree on the opinion that fiscal decentralization increases social welfare as the provision of public goods and services can be tailored more precisely to the needs of the respective citizens. It is often argued that decentralization increases economic efficiency because subnational governments are better positioned than the national government to deliver public services as a result of proximity and informational advantage.

Bird and Wallich (1993) note that fiscal decentralization is observed as a portion of reform package for improving public sector efficiency, to raise competition among lower level government in supplying public goods and to accelerate economic growth. Rodríguez-Pose and Krøijer (2009) summarize arguments in favour of fiscal decentralization. They claim it promotes higher efficiency, better public service, greater transparency and, eventually, economic growth.

Oates (2005) and other relevant studies (e.g. Halásková and Halásková, 2014 or OECD, KIPF, 2016) point out opinion that fiscal decentralization enhances consumer and producer efficiency what stimulates the economic growth. Decentralization may affect growth indirectly through its impact on other socio-economic variables, such as macro stability and government quality (Martinez-Vazquez and McNab, 2003), or through its interaction with the institutional framework (Feld and Schnellenbach, 2011). Newly, Martinez-Vazquez et al. (2017) offer a complex review of the impact of fiscal decentralization on the economy and society.

The studies comparing fiscal decentralization systems can be found e.g. in Thiessen (2003), Aristovnik (2012) or Oplotnik and Finžgar (2013), but and results are not unambiguous due to variances in time span and country sample. Bryson et al. (2004) survey fiscal decentralization in the Czech Republics. They conclude the Czechia made more substantial transfers to local governments, but the development of fiscal autonomy was stifled as transfers reduced the need for own-source local revenues. The Czech real estate tax has remained nominal as it was under central planning, and its administration is fraught with moral hazard problems. The property tax never became a tool for generating independent funds. Jílek (2009) deals with the issue of fiscal decentralization in the Czechia. The analysis shows that though the expenditure decentralization in the Czechia is quite high, the degree of revenue and tax decentralization is low. This result is supported also by the comparison with OECD-Europe unitary countries average.

3   Methodology and data

As written above, the aim of the paper is to examine fiscal decentralization and federalism in term of fiscal fragmentation and decentralization ratios.

Hendrick et al. (2011) suggest that fiscal fragmentation is composed of three dimensions: total fragmentation, vertical fragmentation and horizontal fragmentation. For the purposes of this study, total fragmentation is the total number of SNGs in a country area. This concept can be used and applied in aggregates or standardized by some factor such as population or land area. Vertical fragmentation refers to the number of government tiers. Finally, horizontal fragmentation refers to number of local governments per government tier.

Since fiscal decentralization has many dimensions, the following indicators are calculated and used for empirical examination and variables are specified as follows:

• Expenditure decentralization (*EXPD*) is the ratio of sub-central to total general government expenditure as defined in (1).

$$EXPD_i = \frac{EXP_{SCG} - Tr_{SCG(-)}}{EXP_i - Tr_{(-)}} \times 100 \tag{1}$$

EXP_{SCG} means total expenditures of sub-central government (SCG), Tr_{SCG} are transfers provided by SCG, EXP expresses total government expenditures, Tr describes transfers provided between levels of government

• Revenue decentralization (*REVD*) means the ratio of sub-central own revenue to total general government revenue.

$$REVD_i = \frac{REV_{SCG} - Tr_{SCG(+)}}{REV_i - Tr_{(+)}} \times 100 \tag{2}$$

In (2), REV_{SCG} means total revenues of SCG, Tr_{SCG} decribes transfers (grants) received by SCG, REV expresses total government revenues, Tr are transfers between levels of government.

• Tax revenue decentralization (*TAXD*) is expressing the ratio of sub-central tax revenue (TAX_{SCG}) to total general government tax revenue (*TAX*):

$$TAXD_i = \frac{TAX_{SCG}}{TAX_i} \times 100 \tag{3}$$

Countries under examination are the Czechia, Estonia, Finland, Italy and Spain and they are chosen with the intention to show a divergence between EU countries. The empirical evidence is focused on the period 1995-2016 (the latest available time series) and relies on the secondary statistical data of the OECD Fiscal Decentralization Database and the national statistical offices.

4   Empirical results

This section is focuses on comparing a fiscal fragmentation and the degree of decentralization using decentralization rations in the sample of countries.

4.1   The territorial organisation and fragmentation

As mentioned, Hendrick et al. (2011) note that fiscal fragmentation is composed of three dimensions: total fragmentation, vertical fragmentation and horizontal fragmentation. That´s why the territorial and government organization is introduced first.

The Czechia has a two-tier SCG system, with no hierarchical link. The municipal level includes municipalities, towns and 25 statutory cities. The Municipal and Region acts, both amended in 2002,

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make a distinction between autonomous and delegated responsibilities, i.e. exercised on behalf of the central government. While municipalities have equal status, they are divided into three categories according to the scope of their delegated responsibilities: 205 municipalities with "extended powers" (ORP), 1 036 municipalities with some delegated powers (e.g. registry office, building authority) including 183 municipalities with an authorised municipal authority and the remaining which are "basic" municipalities.

Estonia has a single tier of local government comprising 213 municipalities recognised as self-governing. They include cities and rural municipalities, all with the same legal status. The number of municipalities has gradually decreased since the 2004 Act on the Promotion of Local Government Mergers, however very slowly. Therefore, in 2014 the central government launched a new local government reform promoting, among other things, municipal mergers for 2015-18 for municipalities under 5 000 inhabitants. All municipalities have the legal possibility to create sub-municipal entities, with limited self-governing status. Only two cities and two rural municipalities have seized this opportunity. Estonia is also divided into 15 counties, which are administrative subdivisions led by governors appointed by the central government.

Finland has one subnational level composed of 313 municipalities. While there are 19 "regional councils", only one (the island region of Aland) has an autonomous administration (the other 18 are led by joint municipal boards). Finland has undergone several municipal reforms over the past years, in particular the PARAS reform in 2005-07 which promoted municipal mergers and inter-municipal cooperation. The number of municipalities has steadily decreased from 475 in 1976 to the current number. A new reform was launched in 2015 aimed at creating a new autonomous elected regional level above the existing 18 "regional councils". The reform should come into force in January 2019.

Italy has a three-tier system of SNGs, comprising the regions, the provinces and the municipalities. Italy is often referred to as a "regionalised country", in particular since the constitutional reform of 2001 and the fiscal federalism law of 2009 both granted greater autonomy to the regions. In addition, Italy has an asymmetric decentralization with 15 ordinary-status regions (RSO) and the 5 special status regions (RSS) enjoying even more legislative and financial autonomy. This latter region is divided into two provinces, each with its own special statute. Provinces and municipalities are not governed by regional legislation, except in the RSS. Italy also has a state territorial administration based on prefectures at the provincial level. Regions have significant legislative and administrative powers since the 2001 Constitutional reform which gave them exclusive legislative power with respect to any matter not expressly reserved to State.

Spain is a unitary state having a three-tier system of SNG whose autonomy is constitutionally recognised. In reality, Spain is a quasi-federation with autonomous communities (ACs) having a large autonomy, including the exclusive ability to decide on the organisation of municipalities and provinces within the regional territory. However, municipal and provincial functions and finances are decided in the framework of the national law and not by regional constitution or law, unlike federations. As a result, local governments are governed jointly by the central government and the regions. At regional level, decentralization is asymmetric, with two distinct regimes: the common regime (15 ACs) and the "foral" regime (Basque Country and Navarra) which is characterised by an almost complete spending and revenue autonomy. In addition, ACs of the common regime each have their specific statute, allowing for some distinctive features, especially since the 2000s. Municipal and provincial organisation differs from one region to another. Recently, the 27/2013 Law on the Rationalisation and Sustainability of Local Administration (LRSAL) introduced incentives to promote municipal mergers on a voluntary basis. Spain also has a structured level of 3 719 sub-municipal entities which are deconcentrated municipal organs of the municipalities without own legal personality. Spain also counts two autonomous cities in North Africa (Ceuta and Melilla), with less powers than ACs but with more than municipalities. Finally, there is a central government territorial administration including General Delegates at regional level and Sub-delegates at provincial level.

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Table 1. Fiscal fragmentation

	Area (km²)	Population (mil.)	Municipal level (1. tier)	Intermediate level (2. tier)	Regional / state level (3. tier)	Total number of SCGs	Averige municipal size	Average area (km²)/ municipal
Czechia	78 867	10.525	6 258	-	14	6272	1 640 inhabitants	13
Estonia	45 227	1.316	213	-	-	213	6 165 inhabitants	212
Finland	303 891	5. 463	313	-	1	314	17 530 inhabitants	968
Italy	302 073	60.695	8 047	107	20	8 174	7 545 inhabitants	37
Spain	501 757	46.464	8119	50	17	8186	5 605 inhabitants	61

Source: author´s calculations based on OECD (2016) and the national statistical offices.

Table 1 summarizes important facts about fiscal fragmentation. Vertical fragmentation refers to the number of government tiers. It is evident that the least vertically fragmented country is Estonia with a single tier of SNGs, especially thanks to the area and population. The Czechia and Finland have a two-tier SCG system and Italy with the Spain a three-tier SCG system. If total fragmentation (the total number of SNGs in a country area) and horizontal fragmentation (refers to number of local governments per government tier) are analysed, result are significantly different. From this point of view, the Czechia is the most fragmented country with the smallest average municipal size (1640 inhabitants) and average area per municipality. On the other hand, Finland is the most defragmented country with about 10 times higher average municipal size and 75 fold greater area than the Czechia. The reason can be seen not only in the topography of the countries, but also in decentralization implementation in the Czechia, as local autonomy was given to each separate local government or settlement unit, even if that unit was a tiny village. If fragmentation is standardized by factor such as population or land area, than Italy, Spain and Estonia are similar, although Estonia is less fragmented due its density (30 inhabitants / km² vs. 93 in Spain and 206 in Italy). In case of Estonia is also evident activity of State to decrease fragmentation (compulsory mergers for municipalities under 5 000 inhabitants).

4.2 The main subnational governments' responsibilities and decentralization comparison

The magnitude of local public sectors' responsibilities is often defined as the degree of decentralization. The decentralization degree is possible to measure using decentralization ratios defined in equations (1)-(3). Anyway, subnational governments' responsibilities are key especially to the expenditure decentralization, so they are presented for illustration of differences in a country sample too.

Figure 1 shows development of expenditure decentralization indicator from 1995 to 2016. Finland and Spain report higher average expenditure decentralization ratio EXPD (37.25% and 43.3%) than countries with limited SNGs responsibilities (Czechia 27.46%, Estonia 25.61% and Italy 29%). The values of indicator are in line with the changes in governments' responsibilities and reforms as described hereinafter.
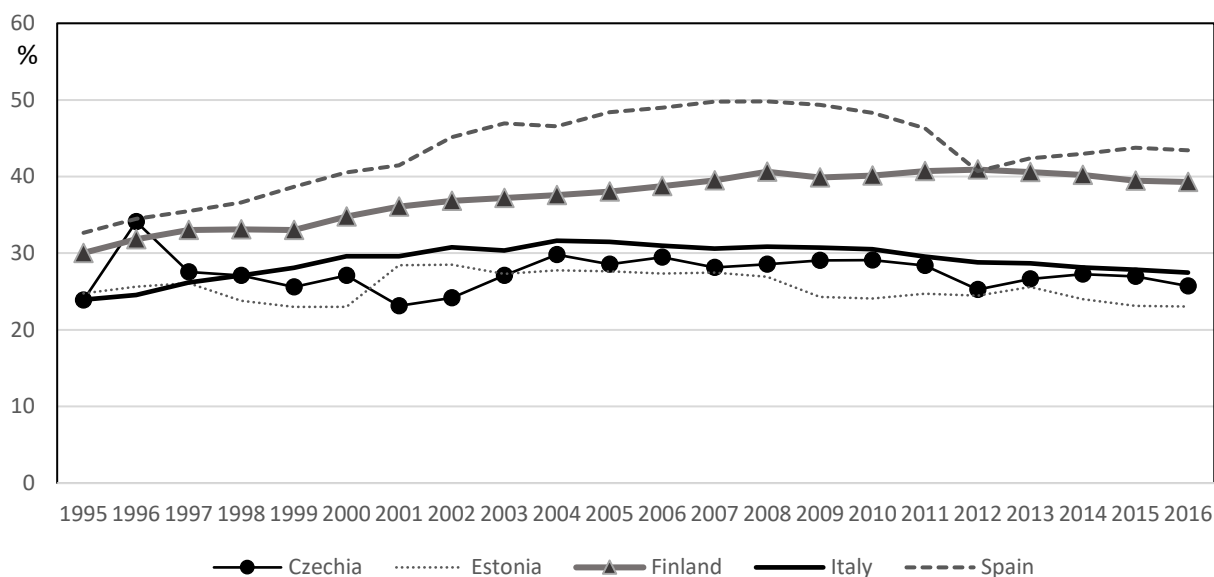
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Fig. 1. Expenditure decentralization (Source: author´s calculations)

Czech municipal competences include education (pre-elementary, primary education), agriculture, housing, primary health care, social care services, local roads and public transport, water and waste management (ORP only). Regional responsibilities include secondary education, regional roads, public transport, health care/general hospitals, economic development and planning, social assistance for disadvantaged groups.

Estonian municipalities are responsible for education (nursery, primary and secondary education), social welfare (services for the elderly, inclusion), housing and utilities, water supply and sewerage, waste, local planning, local roads and public transport, sports and culture (municipal libraries and museums), etc. The Local Government Reform provides a reorganisation of functions between the central government and the municipalities, e.g. in the secondary education sector, to allow for balancing the functions assigned to local authorities and their capacity to perform.

In Finland, municipalities have a wide range of responsibilities which have been extended over the years. They include education (up to upper secondary schools, vocational education), healthcare, social services (old-age, disabled people and childcare), town and land-use planning, water and energy supply, waste management, infrastructure maintenance, environmental protection and fire and rescue services. In the framework of the recent reform, new self-governing regions are in charge of the organisation of primary and specialised healthcare and social services (transferred from the responsibility of municipalities). In addition, future autonomous regions could take over other functions presently under the responsibility of current regional councils, Centres for Economic Development, Transport and the Environment (mostly regarding regional development, rescue services, etc.).

Italian regions are responsible for healthcare, transport, social services and housing, economic development, environmental protection, culture, agriculture, education, etc. Some responsibilities are shared with the central government, resulting in significant overlap (concurrent responsibilities). Following the new law, provincial tasks were transferred to regions, municipalities or new-inter-municipal bodies, depending on each region. Municipal responsibilities include town planning, building and commercial permits, social housing, local police, local public transport and roads, water and waste management, education (pre and primary schools buildings), social services, local economic development, recreation and culture. The Constitutional reform provides for significant changes, intending to clarify the allocation of responsibilities between the central government and ordinary regions.

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In Spain, autonomous communities responsibilities are defined in their autonomous statute but, as a general rule, all responsibilities not expressly attributed to the central state by the Constitution are devolved to ACs, for which 23 areas of responsibilities are listed. In addition, there are also shared competencies between the centre and the regions (education, social services, universities, municipal and provincial supervision). ACs have large responsibilities which typically include education (since 2000), healthcare (since 2002), public order, planning, urbanism and housing, transport, environmental protection, agriculture, culture, social assistance, etc. Provinces are responsible for public services and investment projects of supra-municipal character as well as technical, legal, and economic assistance to small municipalities (less than 5 000 inhabitants). The LRSAL strengthened their role by recentralising some tasks of municipalities under 20 000 inhabitants at the provincial level. Municipal responsibilities vary according to their demographic size and they have mandatory "core competencies" and optional tasks (clarified by the LRSAL). They are all responsible for local public utilities (waste and water supply), public lighting, road maintenance and municipal police. Larger municipalities have additional responsibilities, including markets, public parks, social services, environmental protection, public transport, culture, sport facilities, emergency and fire-fighting service.
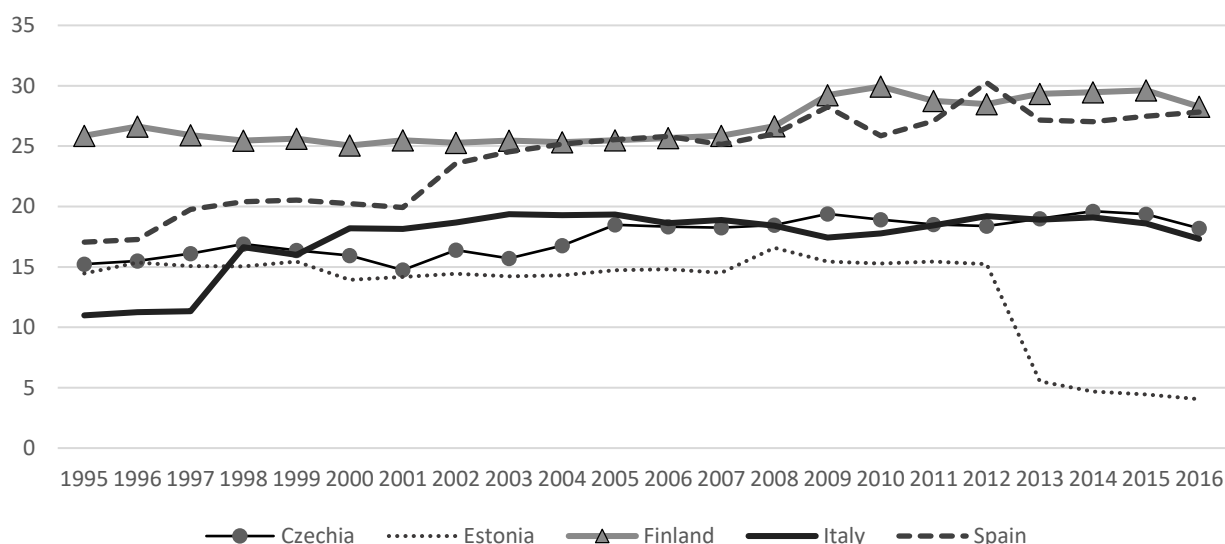

Fig. 2. Revenue decentralization (Source: author´s calculations)

Figure 2 captures revenue decentralization indicator REVD, which is defined as the ratio of own local and state government revenue (total revenue less the intergovernmental transfer revenue of that government level) to total general government revenue. Finally, tax revenue decentralisation TAXD in Figure 3 is the ratio, expressing share of sub-central tax revenue to total general government tax revenue. Consolidated total general government revenue is defined and has been calculated as global total revenue at general government level plus the total inter-governmental property income. The addition is made because the latter represents payments by one level of government for a service provided by another government level and it essentially avoids consolidation of property income at general government level. These revenue indicators corresponds to the most common argument of the allocation of authority when the government that collects revenue has authority associated with its own revenue or the tax to be collected (presented e.g. by Oates, 2005).

The degree of revenue decentralization is substantially lower in all countries than expenditure decentralization (in average 13 percentage points). The development is stable, except increase of values due to the constitutional reform of 2001 in Italy and sharp decline after Estonian local government reform. Estonia limited revenue and tax power of municipalities extensively and the

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difference in values is 10 p.p. (revenue decentralization) and 12 p.p. (tax decentralization) between years 2012 and 2013. Estonia has become the most centralized country from the sample.
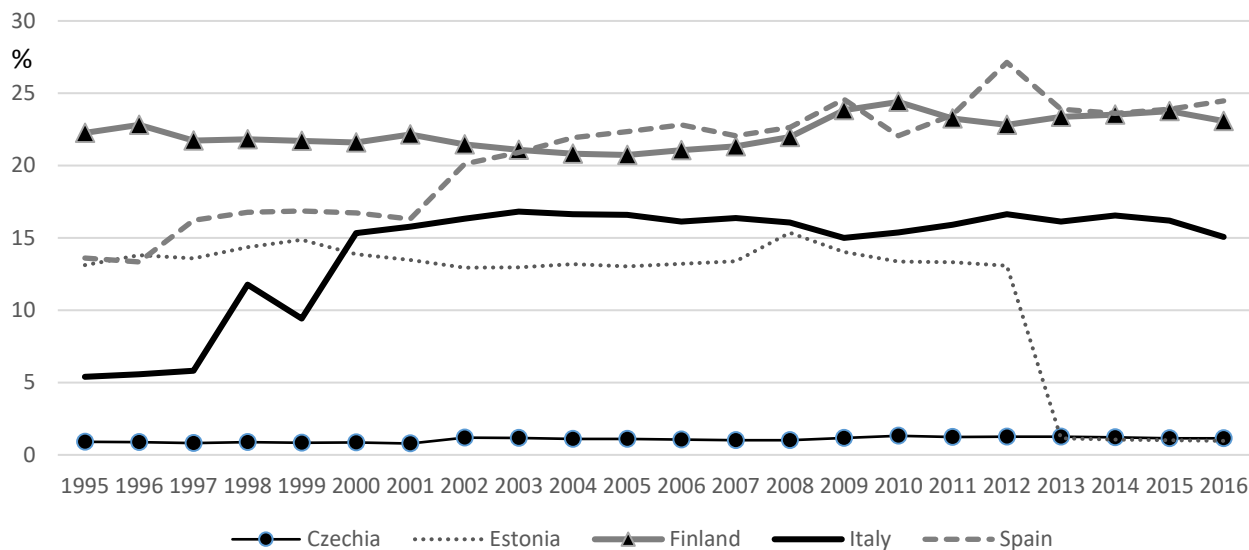

Fig. 3. Tax decentralization (Source: author´s calculations)

In accordance with Figure 3, it is possible to confirm very low tax decentralization and autonomy of SNGs in the Czechia and Estonia (since 2013). The reason is that shared taxes usually appear in official statistics as sub-national revenue, although the sub-national government has no autonomy in determining the revenue base or rate.

While both revenue and expenditure became more decentralized (except Estonia) over the past years, expenditure decentralization outpaced revenue decentralization, resulting in a higher vertical fiscal imbalance and growing intergovernmental grants (for details look at OECD Decentralisation database). Reforms to intergovernmental fiscal frameworks can explain only a part of the evolution of decentralization indicators. Generally, the most common fiscal federalism reforms include devolution of new responsibilities for public services to SNGs, especially in the area of economic affairs and social welfare, the upgrading and amendment of equalisation and other intergovernmental grant systems, the introduction or tightening of SNGs fiscal rules and sub-central tax reforms, mostly entailing a stronger harmonization of central and sub-central tax bases.

5   Conclusion

The aim of the paper was to provide the empirical evidence of fiscal decentralization and fiscal federalism in 5 selected EU countries in the period 1995-2016. The Czechia, Estonia, Finland, Italy and Spain, were compared in term of fiscal fragmentation and decentralization ratios. The Czechia is the most fragmented country with the smallest average municipal size (1640 inhabitants) and average area per municipality (13 km^2). On the other hand, Finland is the most defragmented country with about 10 times higher average municipal size (17 530 inhabitants) and 75 fold greater area (968 km^2) than the Czechia. If fragmentation is standardized by factor such as population or land area, than Italy, Spain and Estonia are similarly fragmentized.

Results suggest that the degree of decentralization varies widely across country sample but has changed only fractionally over the reported period. Estonia and Italy embarked the most striking decentralization process and considerable changes in SNGs expenditure and taxation powers. Generally, expenditure decentralization can be used for capturing the importance of the local public sector in the country's public sector. Finland and Spain report higher average expenditure decentralization (37.25% and 43.3%) than countries with limited SNGs responsibilities (Czechia

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27.46%, Estonia 25.61% and Italy 29%). Revenue decentralization shares about 20%, with values between 13% for Estonia and 27% for the Finland in average. Tax revenue decentralization varies from 1 % in the Czechia to 22 % in Finland, with average value 14 %. The values of indicator are in line with the changes in governments' responsibilities and reforms as described above.

Despite the fact that both revenue and expenditure became more decentralized over the past years, expenditure decentralization outpaced revenue decentralization about 13 percentage points, resulting in a higher vertical fiscal imbalance and growing intergovernmental grants.

6   Acknowledgement

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SATISFIED OR COMPETENT: BUSINESS ENVIRONMENT QUALITY AND ENTREPRENEURIAL REACTION

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Abstract
Entrepreneurial competencies and satisfaction are closely linked together. Their relationship affects the final success in business, which is supported by results of literature review. The aim of the paper is to demonstrate that satisfaction with the quality of the business environment is important in the period of growth, when in the stagnation period the entrepreneurs' skills and competencies are more used. The results are based on the results an empirical study (210 respondents) in the Czech Republic. Moreover, the study concludes that the competence basis in businesses must be internally strong to meet external challenges and changes successfully. Those situations are presented in form of three scenarios with more than 60% of variance explained.

Keywords
Business, Business environment, Competencies, Failure, Success.

JEL classification
L26, O44, R58

1   Introduction

Entrepreneurs reflect current modern trends, which are more dynamic, especially in the SME sector. Opposite to that, entrepreneurial competencies are considered with personality traits, skills and knowledge, and therefore can be connected with an ability of the entrepreneur to be successful. Namely, Man et al. (2002) distinguished six major areas such as opportunity, relationship, conceptual, organizing, strategic, and commitment competencies. Individual level of those competences can affect an individual business environment evaluation by level of satisfaction. All characteristics have long-term effects and they have closer links to organizational performance within current business environment. Competent entrepreneurs in the long term seems to be a more important issue in the quality assessment than directly providing them with more resources.

In this paper, after introducing the concept of business environment quality assessment at the company level, a competency approach will be explained. A research question how entrepreneurial satisfaction and competencies could affect future reaction is explained. The analysis consists of three constructs such as entrepreneurial competencies, level of satisfaction within business life cycle. The main goal of paper is to model areas that link different competency areas with factors from business environment, which led to business success. This study is based on results of field survey among 210 companies in the Czech Republic.

2   Literature review

Active support of entrepreneurial competences goes hand in hand with business success (Bacigalupo et al., 2016, Komarkova, Conrads and Collado, 2015, Pilková et al., 2016). Support of entrepreneurial competencies and their satisfaction seems to be desirable on a national or regional level to enhance development of entrepreneurship and growth of business environment quality. (Fayolle, Gailly and

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Lassas Clerc, 2006, Von Graevenitz, Harhoff and Weber, 2010, Šebestová, 2016, Šebestová and Rylková, 2011, Weber, 2011, Ahmad et. al., 2010). An active business policy presents development of competent entrepreneurs in the long-term time frame and it seems to be important issue for sustainability and active business support. The previous studies showed that entrepreneurs are capable of minimising the negative impact of business environment when they develop their competencies (Dvouletý, 2017, Greblikaite, Sroka and Gerulaitiene, 2016).

2.1   Satisfaction with business environment

Some previous studies show that environment has a significant direct effect or a moderating effect on business success (Entrialgo et al., 2001, Dvouletý, 2017, Pilková et al., 2016), while others have found weak tie with that issue (Jogaratnam, 2002). On the other hand, business environment could bring opportunities for entrepreneurs and it has an important contribution to decision making about product placement, place of business and other issues.

In line with that Markman (2007) argues that entrepreneurs are those who possess the knowledge, skills, and abilities to be a strategic leader for their ventures, in which their actions influence the ventures' success.   Based on that content, a skilled entrepreneur is one who can manage the environmental challenges, this study attempts to test a model that places prime responsibility for business success on the competencies of the entrepreneur.

2.2   Entrepreneurial competencies

The definition of entrepreneurial competencies and the stress on the entrepreneurial literacy development can be found in "*Green Paper on Entrepreneurship*" (EU Commission, 2003). This agenda was updated by the "*Small Business Act*", published in 2008, when eight basic competencies were identified in a focus on knowledge economy building. The "*New skills agenda for Europe 2020*" is just going to be implemented in the entrepreneurial education. The origin of the Competence model is created on the EntreComp Competence Model (Bacigalupo et al., 2016), where the main stress is put on the resources for the business and their optimization.

Propositions related to these relationships are presented by conceptual framework to be able to incorporate findings from previous studies and current results from empirical study (see Figure 1).
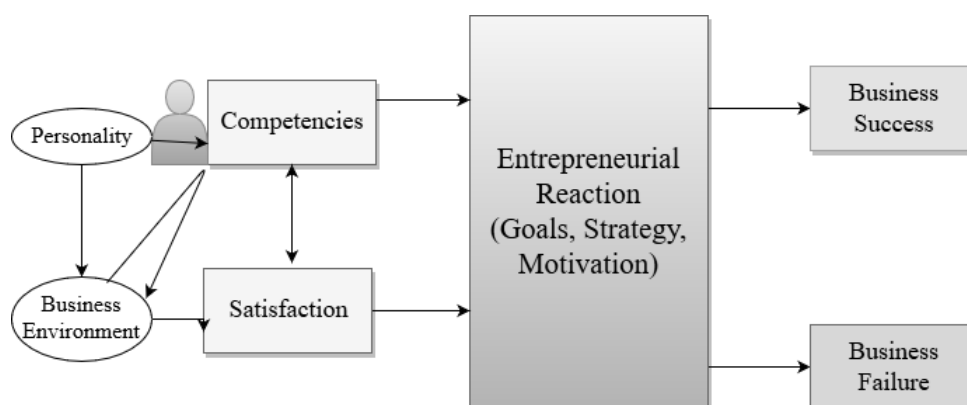

Fig. 1. Conceptual framework for Environment and Competencies (Source: author´s illustration)

As can be seen from the figure 1, there are two input variables, namely satisfaction and competence, where direct influence on satisfaction has the business environment. On the other hand, the entrepreneur affects competencies himself. This framework indicates the relationship between competencies and satisfaction how they can interact each other. Both variables affect the entrepreneur's reaction, business development and final business result in form of success or failure. This was a reason for research question setting: "Does the relationship between the number of factors

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of competence and environmental factors differ?" An empirical study was conducted to get sophisticated results.

3   Methodology and data

The primary quantitative research between business population in the Czech Republic was used to obtain relevant data. The aim of the questionnaire survey is to identify important factors which cause barriers in doing business and which competencies would be useful for sustainable business. Data collection started in February 2017 to April 2017 in the form of an electronic questionnaire. An omnibus survey was used to obtain relevant quantitative data from entrepreneurial population by stratified sample use. The response rate was 70%, when 300 respondents obtained the questionnaire and the sample for final evaluation consists from 210 entities. It was obtained a representative sample at a confidence level of 95 % with a 5% margin of error (within the total business population in Czech Republic).

Most companies in the sample were carrying out business in the industry, namely 46 %, 27% in services, 21% in trade (wholesale, retail) and 6% in agriculture. The number of small businesses, namely enterprises employing up to 50 employees that took part amounted to 58%, where enterprises employing up to 10 employees amounted to 20% and enterprises employing 11-49 employees 38%. Medium-sized enterprises (between 50 and 250 employees) were represented in 30% of cases and large companies (250+ employees) has their share of 12%. More than 75.2 % of companies in the sample was in growth phase, opposite to 24.8 % companies in crisis and decline in the last three years. Most of companies in operating on the market more that 10 years, so there is assumption of business experience (see Figure 2).
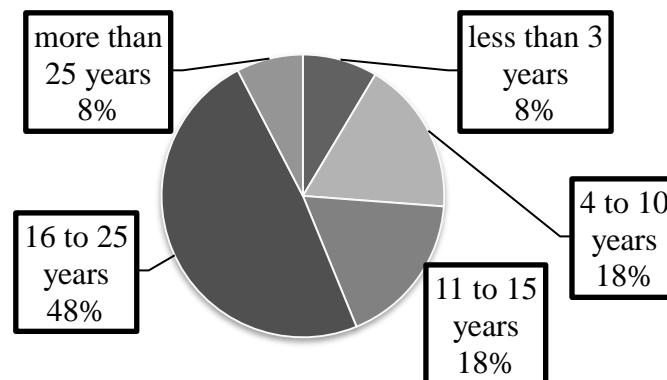

Fig. 2. Structure of the sample by age structure (Source: own research)

To be able to evaluate previously mentioned research question, results of the one part from the questionnaire are presented. All factors were evaluated by respondents on Likert scale 1 to 5 (where 1 – not connected with me and my business, 5 – I am dealing with that factor in everyday life). There are five competencies (CP) and five environmental factors (ENV) presented and evaluated:

- Competencies (CP)
1. *Localization in the region (LOCAL)* – evaluation of business place (their choice);
2. *Payment behaviour of customers (PAY_BEH)* – level of financial management, relationship development;
3. *Quality of workforce (WORK)* – clarity of workplace description, placement of employees;
4. *Tradition (TRAD)* – an influence of business tradition in their family;
5. *Transport accessibility (TRANS)* – knowledge of logistics issues, competence for solving transportation problems.

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- Environmental Factors (ENV)
1. *Lack of alternative sources of financing such as loans, micro-loans, etc., ALT_FIN*;
2. *Legislation, condition for business in general (LEGIS);*
3. *Previous industrial activity in the region, eg. brownfields - PREV_ACT* (Tureckova et. al., 2017)*;*
4. *Public administration, bureaucracy (BUREAU);*
5. *State / regional subsidy policy (SUPPORT).*

To get sophisticated results a factor analysis was used. All data were tested for reliability and Kaiser-Meyer-Olkin test (KMO) was above 0.6. To get principal components, a factor rotation VARIMAX was used. Three scenarios were tested in relationship with business cycle.

4   Empirical results

In the first step of that analysis a basic comparison of selected ten factors was applied. As had been mentioned, results were sorted according business cycle, when "growth" was signal of success and stagnation and crisis is closely connected with business problems and possible failure. In the Table 1 a comparison is made, when maximum difference in successful companies is in factor legislation (LEGIS) and locality (LOCAL). Opposite to that, in companies with problems differ in not only with localization difference, but in an influence of tradition (TRAD) and previous activities in the region (PREV_ACT).

Table 1. Evaluation of factors based on mean score

Type	Variable	Overall		Success Stage			Failure		
		Mean	Std. Deviation	Mean	Std. Deviation	Deviation to overal	Mean	Std. Deviation	Deviation to overal
		A	B	C	D	E (A-C)	F	G	H (A-F)
CP	LOCAL	3.319	1.369	3.152	0.113	*0.167*	3.827	0.139	*-0.508*
CP	TRANS	3.076	1.284	2.968	0.105	0.108	3.404	0.146	-0.328
CP	WORK	3.876	1.247	3.835	0.1	0.041	4	0.164	-0.124
CP	TRAD	2.3	1.345	2.171	0.105	0.129	2.692	0.182	*-0.392*
CP	PAY_BEH	3.343	1.466	3.297	0.115	0.046	3.481	0.206	-0.138
ENV	LEGIS	3.1	1.361	3.247	0.103	*-0.147*	2.654	0.198	*0.446*
ENV	BUREAU	2.814	1.221	2.905	0.089	-0.091	2.538	0.197	0.276
ENV	SUPPORT	2.181	1.243	2.241	0.102	-0.06	2	0.15	0.181
ENV	PREV_ACT	1.786	1.038	1.671	0.073	0.115	2.135	0.173	*-0.349*
ENV	ALT_FIN	2.157	1.241	2.114	0.099	0.043	2.288	0.165	-0.131

Source: own research

Secondly, scenario one was prepared for **overall sample evaluation**. A business cycle was as independent variable to get overall factors for whole sample (total variance explained 66.741%, sig. 0.000). Five groups of factors were extracted, when three groups of them have more than 50 % variance explained (see Table 2).

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Table 2. Scenario 1: Overall Factor Analysis

		Rotated Component Matrix				
Type	Variable	F1	F2	F3	F4	F5
ENV	BUREAU	0.826				
ENV	LEGIS	0.754				
ENV	ALT_FIN	0.714				
CP	TRANS		0.853			
CP	LOCAL		0.628			
ENV	PREV_ACT			0.782		
CP	TRAD			0.682		
CP	WORK				0.832	
CP	PAY_BEH				0.661	
ENV	SUPPORT					0.794

Source: own research, Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

As was mentioned only three factors are the most important. *Political environment* (F1) consists of three environmental variables, *Placement of business (F2)* describing relationship between two competency variables - transport and location. Finally, *Historical Roots* (F3) have a combination of environmental and competency task. This scenario has shown that environmental issues and task are for business success on the first place and they have deeper relationship in business decision-making, as was mentioned in Dvouletý, (2017), Pilková et al. (2016) or Šebestová (2016) research findings.

Growing companies: Scenario two. In that case, the business cycle was defined as dependent variable (in stage of growth). The same number of factors was extracted as in previous scenario one, when *four main factor groups* explained 58.85% of variables (total variance of five factor groups was 68.3%; sig.0.000). Scenario is presented below (Table 3). Those factor groups obtained sub index "s" to indicate success position of examined business in the sample. There were four environmental and five competency variables extracted in total.

Table 3. Scenario 2: Factor Analysis for growing companies

		Rotated Component Matrix				
Type	Variable	F1s	F2s	F3s	F4s	F5s
ENV	BUREAU	0.824				
ENV	LEGIS	0.786				
ENV	ALT_FIN	0.665				
CP	TRAD		0.779			
ENV	SUPPORT		0.677			
CP	PAY_BEH			-0.660		
CP	TRANS				0.856	
CP	LOCAL				0.788	
CP	WORK					0.931

Source: own research, Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Similarity can be seen in the first factor named *Political environment*, when the structure of the factor is the same with overall results (F1s=F1). In contrast to overall results, "*Placement of Business*" is the last factor (F4s=F2). A significant point in that scenario could be seen in factors F2s and F3s, which demonstrate different behaviour of growing and successful businesses. The factor "*Supporting background*" (F2s) illustrates an interaction between business traditions and supporting policy in the region. It means that tradition of business branch in the region and business-friendly environment

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play important role in business success. Last factor, which is pointed out in the scenario two is payment conditions as negative factor for success (F3s). It wasn't founded any connection with previous activities in the region (PREV_ACT). It could be interpreted by significance of opportunities, which give a power for success (Pilková et al., 2016).

Companies in stagnation, crisis: Scenario three. In that case stagnation, crisis in the business cycle was selected as dependent variable. The same number of factors groups as in previous scenarios was extracted, when three main factors groups explained 52.25% of variables (total variance 66.13%; sig.0.000). Behaviour of those companies is very different from overall model in the scenario one. There is any connection with basic factor set from scenario 1 (compare table 2 and table 4). All factor groups are unique. The variable of alternative sources for financing (ALT_FIN) is totally missing. There are four environmental and five competency variables extracted also.

Table 4. Scenario 3: Factor Analysis for companies in failure

		Rotated Component Matrix				
Type	Variable	F1f	F2f	F3f	F4f	F5f
CP	PAY_BEH	0.821				
CP	LOCAL	-0.802				
ENV	PREV_ACT	0.689				
ENV	BUREAU		0.904			
ENV	LEGIS		0.745			
CP	TRANS			0.849		
ENV	SUPPORT				0.929	
CP	WORK					0.805
CP	TRAD					-0.760

Source: own research, Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

This scenario illustrates stress on competency models and economic literacy of business entities to get money for their development (F1f) and their dependence on support, when that factor is on the 4th place (F4f).

Presented scenarios (1-3; tables 2 to 4) support research question about the difference of behaviour of businesses according their business cycle. It seems that competencies are more used in case of problems. Opposite to that, satisfaction affects development and risk-taking in growing phase.

5   Conclusion

There is often a problem, especially in SMEs, that they have poor business and economic competencies to reflect their current cycle and solve business problems effectively. Presented study shows, that successful entrepreneurs are affected mostly by environmental factors than by specific competencies. When the number of companies in the Czech Republic is increasing, it still not possible to specify in detail factors which cause business success, because results of factor analysis are very limited, dependent on the sample size and current situation of respondents.

Main results of the study have shown that success and growth is dependent on current satisfaction with business environment. In contrast to theoretical background, business organisations need to take care of their competencies to avoid competence traps, which are important to business survival.

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6 Acknowledgement

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PROBLEMS OF BROWNFIELD REGENERATION IN THE MORAVIAN-SILESIAN REGION

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Abstract
This contribution deals with problems of brownfield regeneration in the Moravian-Silesian Region, especially factors that in some way can influence the reuse of these objects and areas.. The county belongs to one from the most affected regions with the existence of brownfields in the Czech Republic. Although lately there are a lot of programs and options to their regeneration, the problem can't be solved effectively. It is clear that the occurrence of brownfields in a certain direction can influence the development of the city or municipality, last but not least, there may be pathological phenomena which may endanger the health of the population who live near brownfields. Part of the article are secondary data from database of the Agency CzechInvest and the company Invest MORE. The article also deals with a primary research which is focused on the perception an existence of brownfields from the point of view of the public sector in the given territory. It is obvious that this issue from the perspective of the public sector is a very current topic that is needed nowadays to deal. More developed regions have greater potential of economic growth than the less developed regions.

Keywords
Brownfields, CzechInvest, Czech Republic, Database, Public sector, Regeneration.

JEL classification
R11, R52, R58, Y10

1 Introduction

Abandoned objects and areas or brownfields are nowadays a very serious problem not only in the Czech Republic. National Strategy for regeneration of brownfields (2008) or the earlier Alker (2000) defines brownfield as a realty (a land, object or area), which is inadequately used, neglected and can also be contaminated, which arises as a remnant of industrial, agricultural, military or other activities. This term was introduced into Czech terminology at the beginning of the 21st century. These areas cannot be used appropriately and efficiently without the regeneration process being carried out. As a result of the social and economic development of the last two decades it is possible to find thousands of such areas in the Czech Republic. Estimates are moving about 12.000 locations with a total area of up to 38.000 hectares. The management of brownfields for the use of business entities is coordinated by the state agency CzechInvest, which created the National Brownfields Database, where localized abandoned objects and areas offer business entities for their potential use. To 18. 8. 2018, 462 brownfields are in this database.

   The aim of the article is the identification of factors which reflect the possibility to successful regeneration brownfields in the Moravian-Silesian Region. Presented contribution is structured subsequently. To the beginning follows chapter two. The theoretical basis of brownfield issues, concerning transversal research literature to various relevant themes conceptual planes associated with the regeneration of brownfields. The third chapter introduces the methodology of research, questionnaire survey of brownfield perceptions, the public sector and analysis of unregulated brownfields in the Czech Republic, in the territory of the Moravian-Silesian Region. This is mainly a comparison and a determining the possibility of regeneration of unregistered brownfields of the agency CzechInvest and the database of the company Invest MORE. The conclusion eventually summarizes the most important conclusions resulting from the analysis and contribution in general.

2 Literature review

An access of the public administration to the regeneration of brownfields has been studied at various hierarchical levels of the public administration, usually at the central, regional and municipal level.

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At the central level (individual country), the study usually compares the situation in different countries (e.g. Rizzo et al., 2015) or focus on the status of brownfields in one country (Osman et al., 2015). At the regional level are data of regions used for various support instruments, which should facilitate decision-making by stakeholders involved in the regeneration of brownfields. These are tools for prioritization (Cheng et al., 2011; Pizzol et al., 2011; Agostini et al., 2012) regional development agencies, state and regional authorities, grant agencies, etc. Specific regions are sometimes used as case studies.

Regeneration of brownfields represents a complex process in which participating a various groups of interested parties, including individuals, organizations or other entities that they are directly affect brownfields or their redevelopment. Generally, brownfields in recent decades have gained increasing political trust, because the free agricultural or natural mature lands in densely populated areas become less accessible, more expensive and more protected.

Identification of factors determining the successful regeneration of brownfields (Turečková et al., 2018) (so-called "Factors of a Success") in different geographical and political contexts (i.e. In a different European countries) is crucial to support investors and decision makers in reducing the uncertainties and thus increasing probability of success the possibility of regenerated brownfields (Meyer and Lyons, 2000; Thornton et al., 2007; Dixon et al., 2011).

Although the transformation and conversion of these landscapes into more natural and more environmentally friendly landscape is being promoted as a means of suppressing the ecologically and socially destructive impact of abandoned processes (Burke et al., 2016, Hofmann et al., 2012, Loures, 2014), the perception of people towards different brownfield typologies is still undervalued and the benefits of each typology of brownfields are still poorly dealt with, which are factors that are limiting factors for the achievement of sustainable and durable development of these landscapes.

3   Methodology and data

As an object of analysis were selected unregenerated brownfields, which they are present on the territory of the Moravian-Silesian Region. In 2005-2007, the first census of brownfields was held in the Czech Republic under the CzechInvest Agency. The number of abandoned objects and areas according to the agency was 2 355. Since that period no more brownfields were added. According to experts in the Czech Republic can be up to 11 000 abandoned objects.

From the methodological point of view, the contribution is based on secondary and primary data. The source of secondary data is the brownfield database within CzechInvest. Other sources of secondary data are the database of abandoned objects and areas within the Moravian-Silesian Region, sponsored by the company Invest MORE (invest-msr.com). This company was chosen because it is the only one in the region to have comprehensive data on brownfields that occur in the Moravian-Silesian Region. The company strives to find suitable investors in the given area with the support of direct investments, the development of the business environment and the promotion of cooperation between the public and private sectors.

Within the CzechInvest database (brownfieldy.eu), as of 18. 8. 2018, there are 40 brownfields with an area of 202,5 hectares in the Moravian-Silesian Region. The database of the company Invest MORE has 180 abandoned objects and areas where they are registered brownfields within the Agency CzechInvest. The total area of these brownfields in a given territory is 905,1 hectares.

The primary data was determined by research, where the polling method was used. In the framework of the research was created a structured questionnaire, which deals with the perception of the public sector on brownfield issues in the Czech Republic. The research was launched on 16. 7. through data reports. This paper presents preliminary results, since the research wasn't completed by the date of this post processing close. In total, 299 municipalities and towns within the Moravian-Silesian Region were approached with a preliminary return of 45% (136 municipalities and towns) to 18.8.2018.

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4   Empirical results

The following chapter will be focused on the occurrence of brownfields in the Moravian-Silesian Region. First a comparison of factors will be done which in some way to affect regeneration brownfields between databases CzechInvest and Invest MORE. Another part of the chapter will deal with a primary research which was focused on the occurrence abandoned objects and areas by the public sector.

The table 1 shows the basic factors that are important in the regeneration of brownfields. At first, the factors of the CzechInvest will be described and consequently of the company Invest MORE.

From the table is evident that within the database of the CzechInvest agency occurs on the territory of the Moravian-Silesian Region 40 abandoned objects and areas that they are situated on the area of 202 hectares. In the ownership prevails clearly the private ownership of abandoned objects and areas which it reaches a relative frequency of 60%. The public ownership is at the level of 28% and the remaining 13% of abandoned objects and areas are in a mixed ownership. The next factor, which is an important in the regeneration of brownfields, is the ecological burden. Other factors include contamination of soil and groundwater. The occurrence of soil contamination during the regeneration of an abandoned object and area also carries the appropriate costs for its removal. From The National Brownfields Database is contaminated by 23% of the 40 abandoned objects and areas, the remaining 78% do not assume any ecological burden. Another factor is the previous usage. From the result it is an apparent that brownfields, which they are offered by the Agency CzechInvest in the territory of the Moravian-Silesian Region, were previously in the 40% predominantly utilized in the industry. Brownfields that were previously used for the army are in a relative frequency of 20%. Other significant ownership includes agriculture (17.5%) and the former civic equipment (17.5%). Brownfields which are used for the transport and as the others (warehouses) were each in the relative frequency of 2.5%.

At a company Invest MORE is in the records of 180 abandoned objects and areas, which are spread over an area of 905,1 hectares, which occupy an area of 0.16% of the entire territory of the Moravian-Silesian Region. Within the ownership factor, there is the largest proportion of public ownership that reaches 60%. Brownfields in the public ownership reach 38% and the remaining 2% are in the combined ownership. When comparing with CzechInvest, there is a large difference in the ownership share of the public and private sectors. According the company Invest MORE this is primarily due to the fact that the private owners do not consent with the publication of brownfields in the database, which could subsequently be offered for a possible regeneration. At the ecological burden factor, the database of the company achieves similar values as from CzechInvest. The share of ecologically loaded brownfields is 26%, with the remaining 74% do not carry the ecological load. It is about positive message when it comes to the regeneration. For previous uses is the largest share, that abandoned objects and areas were formerly used for civic amenities. A relative frequency is 46%. Industrial brownfields reach up 29%. The third most frequent value include to abandoned agricultural objects and areas that have a value of 14%. The other abandoned objects and areas reach a small relative frequency, therefore, will not be commented upon.

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Table 1. Basic characteristics of brownfields in the given regions

Factors		CzechInvest	Regional database
Number of brownfields (number)		40	180
Area (ha)		202.55	905.1
Ownership (in %)	Public ownership	27.5	60
	Private ownership	60	38
	Combined ownership	12.5	2
Ecological burden (in %)	Yes	22.5	26
	No	77.5	74
Previous use (in %)	Industrial	40	29.4
	Agricultural	17.5	14.4
	Military	20	7.2
	Mining	0	0.6
	Former civic amenities	17.5	46.1
	Traffic	2.5	0
	Other	2.5	2.3

Source: own survey

Figure 1 shows the proposed use of unregulated brownfields within the CzechInvest agency in the Moravian-Silesian Region. Of the total number 40 abandoned objects and areas are 45% proposed, that were used for the industrial activity and also for the civic amenity. Other possible proposals to the regeneration are for an agricultural activity, military purposes and others (warehouses). It can be said that values proposed use of brownfields has similar values as with the previous use.
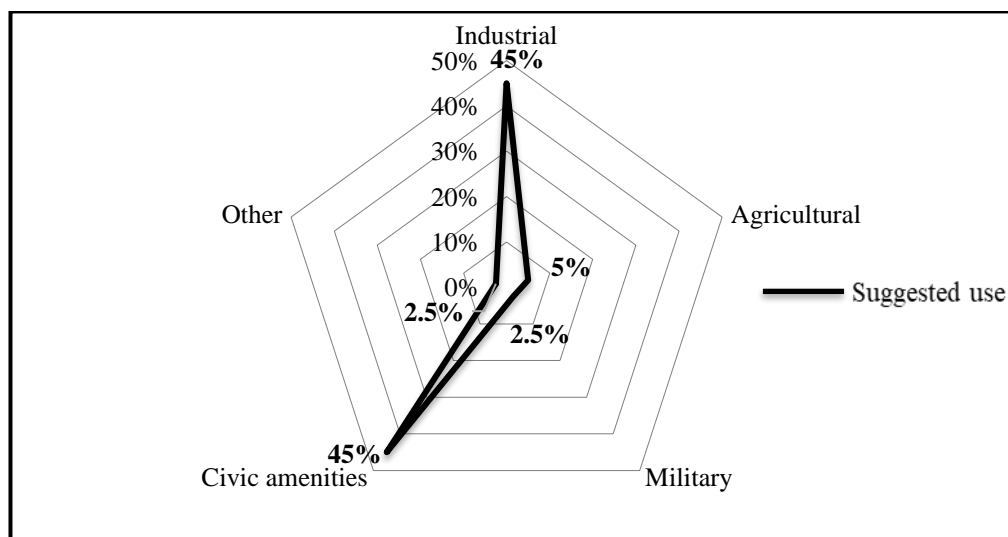
Fig. 1. The proposed use of regenerated brownfields in the Moravian-Silesian Region (Source: own survey)

The following graph focuses on the planned use of unregistered abandoned objects and areas from the database of company Invest MORE in the Moravian-Silesian Region. From the graph it is an evident that 84% of abandoned objects and areas do not have a scheduled regeneration. The remaining 16% of unregistered brownfields already have a certain potential business plan for a regeneration and reuse. According to the author of the article, it is about a live database and workers of the company are constantly trying to support at the moment primarily on social networks abandoned objects and areas that could be used by investors or developers.
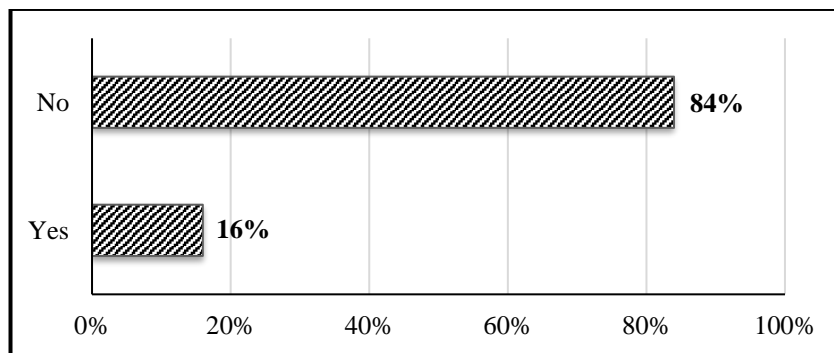
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Fig. 2. The planned use of undegenerated brownfields within of the database to the company Invest MORE
(Source: own survey)

4.1 The results of primary research

The next part of the article will be focused on the primary research that is focused on the perception of the public sector on issue brownfields in the Moravian-Silesian Region.

The figure 3 shows preliminary results within the question which is focused on the occurrence of abandoned objects and areas. Of the 136 surveyed municipalities and towns answered 43% of respondents that they register brownfields on the given territory. From preliminary results it can be said that the occurrence of abandoned objects and areas achieves high values which they are predominantly caused by the historical context of the country.
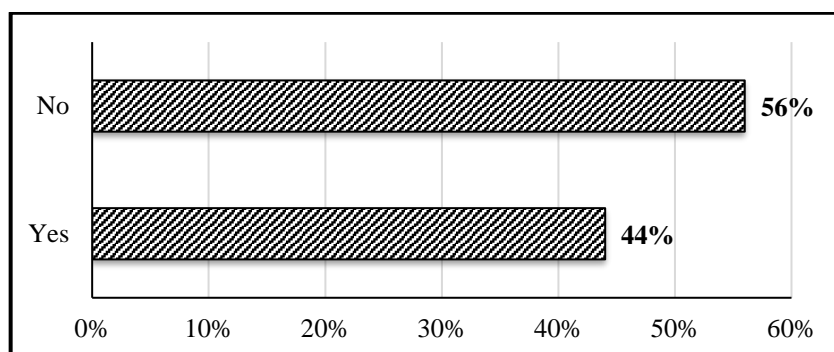
Fig. 3. Do you register some of your cadastral territory abandoned object/s or area/s (brownfield/s)?
(Source: own source; n=136)

Another question focused on the size of brownfields which they occur in individual municipalities and towns of the Moravian-Silesian Region. From the graph it is an evident that the most the public sector records brownfields within 1 ha. Within the relative frequency it is 18% of the total 136 responses. The next answer was that brownfields spread over an area of more than five hectares. Within the relative frequency, this is 10% of respondents.
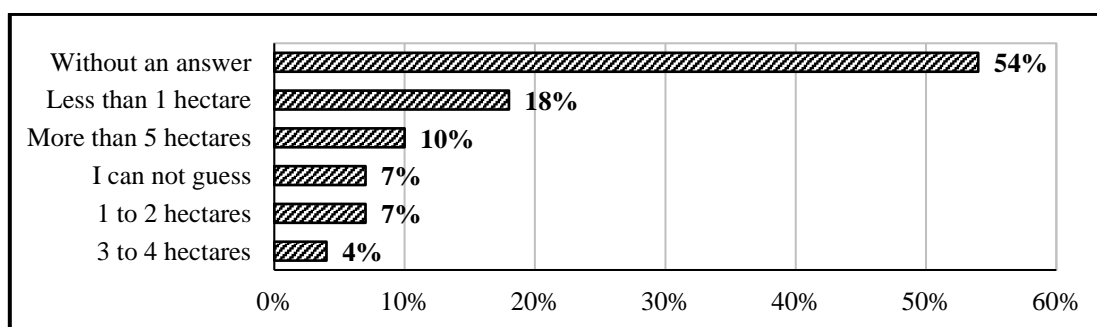
Fig. 4. On what a total area in hectares do you register brownfield/s in your cadastral area? (Source: own source; n=136)

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Figure 5 shows answers for a question that focused on the number of brownfields within the ownership of the Moravian-Silesian Region. Within of the research has been for now registered a total of 149 abandoned objects and areas. The most of brownfields are privately owned at 60.41%. The second most frequent answer was the public ownership with a relative frequency of 26.17%. In the combined ownership was record 13.42%.
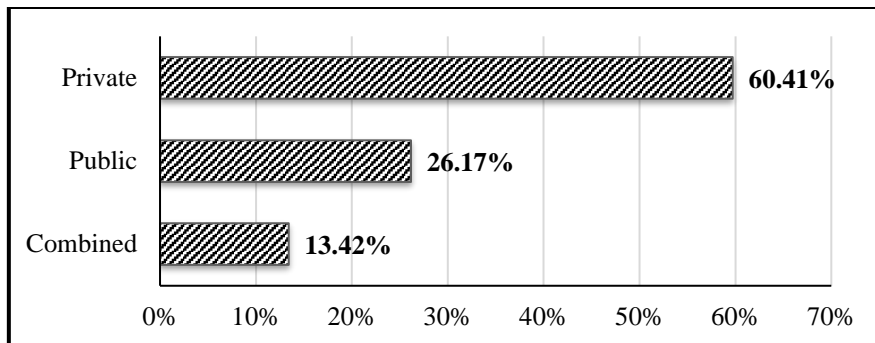
Fig. 5. Please select the indicative number of brownfield/s per ownership type in your cadastral area (multiple variants can be selected) (Source: own source; n=136)

The following graph shows the results of a question that dealt with the previous use of brownfields in selected regions. Respondents should indicate the number of abandoned objects and areas of a previous use. In a total were record 145 replies. The largest group consists of abandoned objects and areas which previously were use in agriculture in 40.69%. The second most frequent group are industrial brownfields and after the former civic amenities which they reach a relative frequency over 21%. The following group consists of abandoned objects and areas that were previously used as warehouses, landfills, etc. in a relative frequency of 11%.
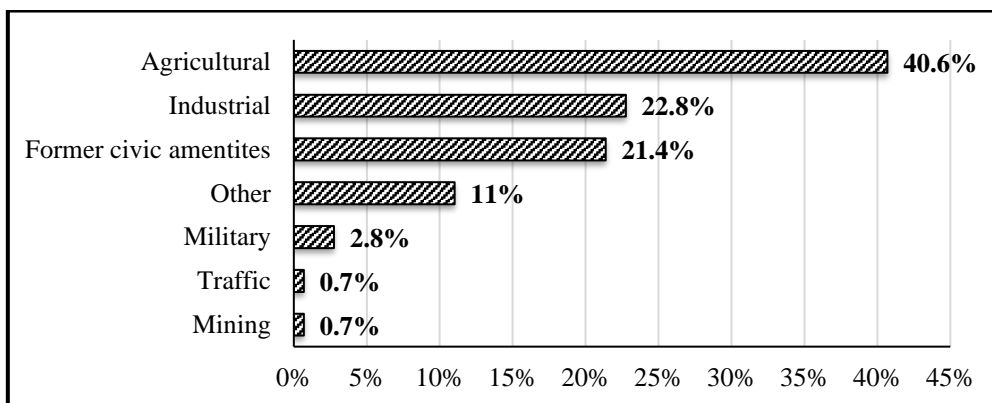
Fig. 6. Please select the indicative number of brownfield/s according to the type that is present in your cadastral territory (more variants can be selected). (Source: own source; n=136)

Figure 7 focuses on results of a question which focused on the influence of brownfields on the development of a town or municipality in the Moravian-Silesian Region. From the data it is clear that respondents suppose that abandoned objects and areas significantly influence the development of the town or municipality within a relative frequency of 19%. Other options "Rather not", "I can not judge" and "Rather yes" have the same number of answers. Relative frequency for all three options is 9%. Other 1% answered that abandoned objects and areas don't affect the development of the municipality or the city.
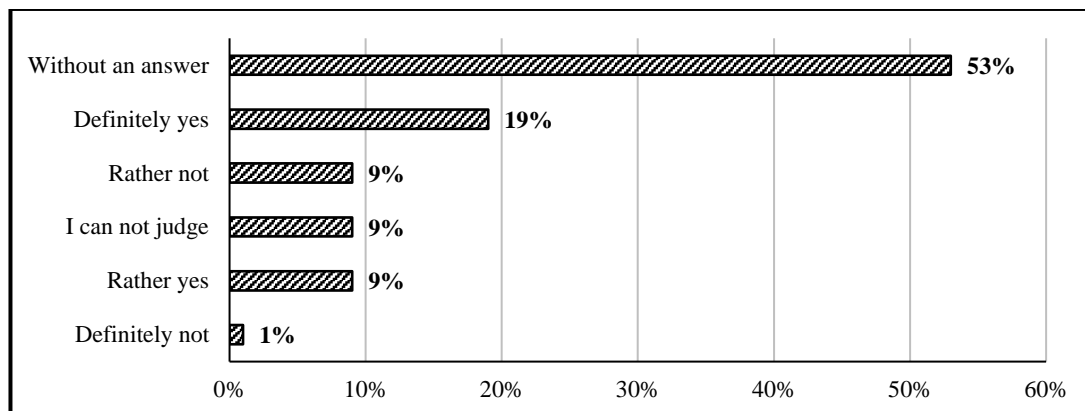
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Fig. 7. Do you think the abandoned object/s have a negative impact on the development of your city or municipality?
(Source: own source; n=136)

Another issue was focused on the cooperation of the public and private sectors within brownfields in the Moravian-Silesian Region. This question was not-answered by 73 respondents at a relative frequency of 53.7%. For a better understanding, the graph shows only the relative frequency according to possible answers from the respondents who answered the question. From the results, 13.2% of respondents to this question have chosen to seek to establish cooperation with the private sector. The second most frequent answer was that municipalities and cities are not trying to get in touch with potential private sector co-operation. The following answer was that brownfield owners are interested in cooperating in brownfield regeneration in 8.8% of respondents. The answer that owners who are not interested in regeneration of brownfields responded with a relative frequency of 9.6% of respondents. The last answer to this question was that municipalities and towns are trying to establish contact but the owner is not responding. This was within the relative frequency of 4.4%.
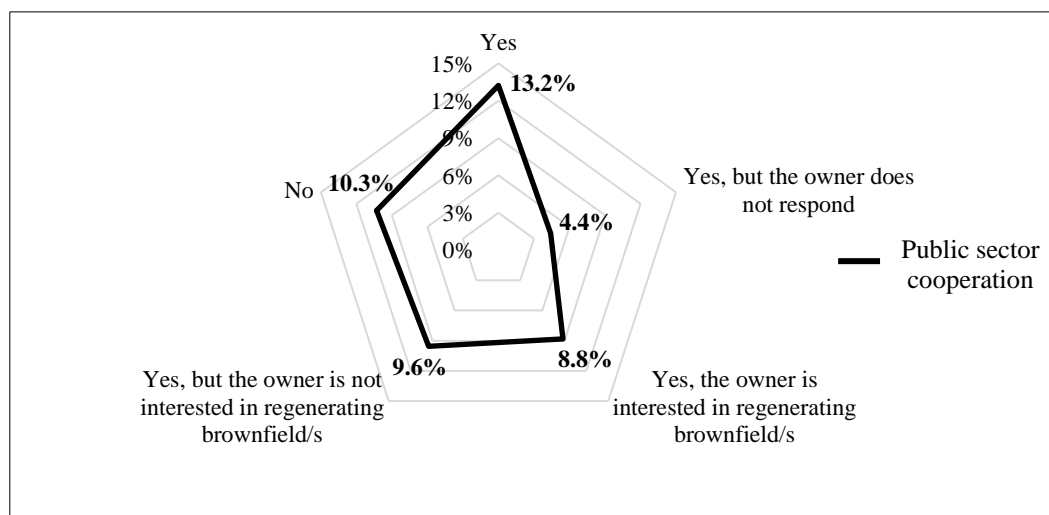

Fig. 8. If own brownfield/s a natural person or a business entity (the private sector), have you been trying to contact with the person or entity for possible regeneration of the object/s or area/s (more variants can be selected)?
(Source: own source; n=136)

Figure 9 deals with the question whether the public sector is trying to create certain conditions for the re-use of brownfields. Within a relative frequency, it can be said that 25% of municipalities and towns do not create conditions for the reuse of abandoned objects and areas for private entities. The remaining 22% are trying to create certain possibilities for the reuse of undegenerated brownfields. The most frequent answer to possible ways was primarily that municipalities and cities are trying to revitalize the area where brownfields are located (remediation of lands, maintenance of objects before

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pathological phenomena etc.). According to replies municipalities are trying to search potential investors and developers for an eventual use of abandoned objects and areas, purchase of objects for a symbolic price and last but not least support certain subsidies for brownfields regeneration.
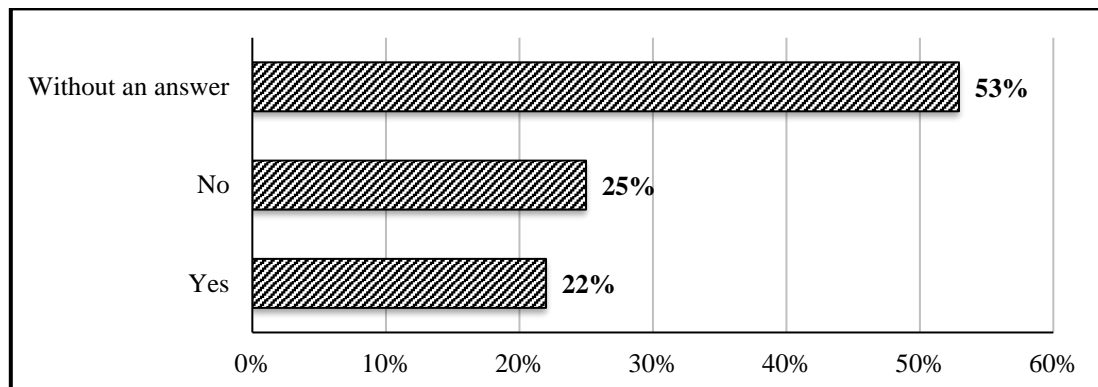
Fig. 9. Have you generally tried to create conditions for the re-use of brownfield/s in the municipality/city by private entities – firms (infrastructure modification, revitalization of contaminated areas, felling of tree species, securing statics of abandoned buildings, financial support or subsidies, transfer of brownfield/s in the property of the municipality/city for a symbolic price, etc.)? (Source: own source; n=136)

5   Conclusion

The issue of brownfields is nowadays a very topical theme. Brownfields are a weak point and a threat to towns and villages where they occur as they reduce the development of regions and can have a negative effect on the public budget of the territory. On the other hand can be said that the brownfield with some potential can contribute to the development of regions and increase not only the economic but also the standard of living of the population.

The aim of the contribution was to identify factors that reflect the possibility of the successful regeneration of brownfields on the territory of the Moravian-Silesian Region. In the article, it was found that on the territory of the Moravian-Silesian Region occur 180 abandoned objects and areas that are in the records of the company Invest MORE and CzechInvest. Among the most important indicators which a certain direction affects the regeneration of abandoned objects and areas is above all the size of brownfields. Another problematic indicator appears primarily ownership. From the Invest MORE database has been demonstrated that most abandoned objects and areas are owned by the public sector.

Part of the article was the primary research which deals with the perceptions the existence of abandoned objects and areas from the perspective of the public sector. According to results it is an evident that abandoned objects and areas sees the public sector as a negative influence which is reflected in the development of villages and cities. The big problem is the ownership of an abandoned object or area. From the research it is an evident that brownfields are mostly owned by the private sector which is not interested in the regeneration or does not have enough funds to repair and re-use them.

6   Acknowledgement

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SMART APPROACH IN REGIONAL DEVELOPMENT

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Abstract
SMART is typical for its highly sophisticated analytical methods, attitudes, communications and technologies used for projecting the aims, procedures and planning, and it applies to the entire discipline of transfer of smart solutions into the material and immaterial innovations. In the context of the regional development, the word SMART in its narrow sense is usually connected with the word City, i.e. Smart City, which represents a concept of the developed city based on a sustainable economic development and a quality of life based on efficient utilization of human and social capital and modern information and communication technologies. In this article, the SMART concept will be presented in its broad sense from the perspective of the regional development, the objective being to delimit and identify the regions, elements and processes in which the SMART concept can be appropriately applied and developed in such a way that it promotes a general development in the regions in a positive sense and at the same time, it contributes to the increase of the standards and the quality of life of its population.

Keywords
Business environment, Civil society, Development, Public administration, Region, SMART.

JEL classification
O31, P25, P48, R11.

1   Introduction

The economic growth is accompanied by a range of interconnected and simultaneous processes such as the deepening globalization tendency and production-technological specialization, digitalization, the development of information and communication technologies, the accentuation of the developing and source sustainability, and changes in the social structure based on the consequences of migration. A range of attitudes of the organization of civil society on the regional level is based on the reflection of these international trends in the context of the acceptance and emphasis of the local specifics (Cvik and MacGregor Pelikánová, 2015), relying on the direct interaction with the population of the region, and participates in the common cooperation and fulfilment of the collective and individual interests with the aim to increase the living standards of its population through activities in the regional development with the participation of the local corporate sector in the context of corporate social responsibility (Pakšiová, 2016). The regional development thus represents an interconnected, synergetic and dynamic complex of processes, elements and relations characteristic and unique for the given region, which transforms this region through the interaction with the outside environment as the society demands. The development, in a positive sense, does not damage its own resource base, is sustainable and primarily focused on the activation of inner resources that get transformed into the developing potential. For that reason, the Smart concept is related to terms such as the shared economy, circular economy, sustainable economy, etc. The Smart concept emphasises the implementation of highly sophisticated methods, procedures, techniques and ways of communication into the various forms of practices and actions following the aim to improve the present condition and increase the acceptance of the performances of all involved subjects.

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The abbreviation SMART itself used to be related to the setting of the aims and the metrics in the control and planning of the management, and it is an acronym composed of the capital letters of individual English names for the attributes of the aims as follows: (1) Specific, (2) Measurable, (3) Acceptable/Achievable, (4) Realistic/Relevant and (5) Timely/Time-related. Recently a range of new alternatives of the expression SMART are used, for example, SMARTER or KARAT, or the capital letters are used for expressing further semantic content. To accentuate the abbreviation of SMART, the English translation of the word is suitable, meaning clever or intelligent. When attaching the word SMART to any other word, an elaborated and innovative attitude towards the given problems is thus emphasised. In connection with the above mentioned it is necessary to say that the "smart" activities are not a new thing. Plenty of ongoing or finished activities fulfil or have fulfilled the attributes of the SMART concept, they have not just been named and labelled like that.

2   The SMART concept in the regional development

The SMART concept is a rather new applied approach in individual regions of the regional development based on both technical and non-technical innovations, through which we want to emphasise specific attributes that define such approach in general. Among these attributes of the Smart concept belong:

- emphasis on an innovative solution,
- maximum exploitability of resources without waste,
- responsibility towards surroundings,
- consideration towards the environment,
- dynamics and the ability to respond to new impulses quickly,
- and looking for sophisticated ways how to solve the "challenges" in regard to the society development.

It is not possible to set an unambiguous definition of the Smart concept as it always reflects the concrete situation and the sphere of concerned activities. In general, it can be stated that it is:

an innovative and functional approach that deals responsibly with situations and with a positive impact on the society.

The focal point of the Smart concept are people, i.e. involved subjects of the given region that are interested in the application of the Smart concept when solving the given local issue. The ability to interconnect conceptually all these spheres of the population, business units and representatives of public administration depends on the level and methods of their mutual communication, sharing of information and experience, the courage to do things differently and innovatively and face the usual routine. The output of the Smart approach should be to make a Smart Decision and find Smart and functional Solution for the stipulated issue. The main tool of the Smart approach is then a transparent and open information platform, and the principal means is an open and highly effective communication on the level of the social dialogue across all involved actors of the regional development (MacGregor Pelikánová and Cvik, 2015). The Smart approach applied in the activities related to the regional development should positively influence not only the people of the given region, but also entrepreneurs and visitors. A well-applied Smart approach in any activity thus:

- improves the living standard of the population,
- improves the quality of the business environment,
- improves the satisfaction of the visitors.

According to the economic terminology, when the Smart approach is applied suitably it increases the social surplus. Using the Smart approach is limited by the adsorption and adaptation ability of the

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socioeconomic environment of the given region, and at the same time, the social and behavioural aspects and needs of the involved subjects must be taken into consideration.

The projects related to the SMART approach regarding cities and regions (Smart City a Smart Region) may be financed from different levels and with different effectiveness and efficiency (Cvik and MacGregor Pelikánová, 2015). The most frequent and appropriate is (1) financing from regional (local) resources, next from (2) the interregional level, (3) national (state) and (4) international level. The logic is that the narrower the relation between the object of the SMART approach and the financial provider is, the more motivated and responsible is the application process. This is then intensified by the rate of the involvement of the application guarantors of the SMART approach. We may add that the SMART projects in the regional development are usually financed from public or mixed resources, only rarely they are financed entirely from private sources. This is due to the fact that the outputs of the SMART solutions in our case are of public or mixed values, rarely of purely private values.
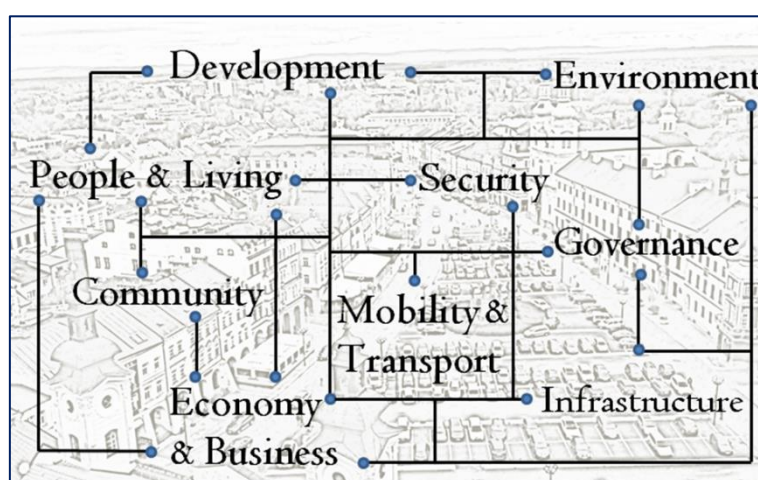

Fig. 1. SMART concept areas in the regional development (Source: own processing)

In our SMART concept in the regional development, nine more or less independent regions were defined (see Fig. 1) that are distinctive with their mutual interaction and synergetic effect. The key spheres in the Smart concept in the regional development are: (1) Development, (2) Environment, (3) People and Living, (4) Security, (5) Community, (6) Mobility and Transport, (7) Governance, (8) Economy and Business, and ultimately (9) Infrastructure. The most important spheres where the Smart concept is applied directly and is presently most frequently associated with are transport and technical, energetic and knowledge-based infrastructure (Schindlerová and Šajdlerová, 2017). An effective and content significant application of the Smart concept in one sphere should function as an accelerator of the regional – integrated development (it concerns a progressive regional development that relies on an application of the most effective cross-section solutions) that reaches into other spheres and strengthens the competitiveness of the region and its quality of life.

It is evident from what was mentioned above that the Smart concept may be considered as a new economic category. Within the defined spheres where the Smart concept is applied as a part of the regional development, we can discern specific, or rather concrete subspheres– elements. The selected elements in the stated spheres are mentioned in the following text. It is both combined, or rather accentuated in the concepts of Smart City and Smart Region, see chapter 3 and 4.

The first compact sphere of the Smart concept in the regional development is the sphere of the Development, which includes such activities in the regions that are intended to improve the original condition or transform it from the broadest point of view concerning the development in the given region.

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The elements that are involved in the development of the region and that may be connected with the Smart concept, are for instance:

- the issue of sustainability, i.e. searching for such a behaviour of subjects that is not contrary to the inherent ability of natural and social environment to sustain the present system for the future, including fulfilment of the social needs alongside with the sustainable utilization of the cultural landscape,
- an innovative city planning and the so-called Smart Growth which is connected with the reutilization and regeneration of brownfields in response to the issue of suburbanization, development in the greenfield and Urban Sprawl (undesirable spreading of cities and municipalities into the surrounding landscape), creating conceptual tools and methods of landscape planning, etc.
- or, the issue of recycling when it is essential to search new, more effective and environment-friendly ways of waste recycling with the aim to conserve both renewable and non-renewable resources.

The sphere of **Environment** is closely related to the sphere of the **Development,** and it includes especially spheres concerning the natural resources and technological processes related to the waste handling and recycling, the environment in its strict sense, or landscape utilization.

Here we can search for opportunities to support the diversity of the environment trying to preserve the natural populations, reduce the pollution and limit the emissions of contaminants, protect the biological diversity and take such measures and methods in urban, agricultural, water and forest ecosystems in order to strengthen the natural functions and services of the landscape and environment, or as a protection against the risks resulting from the climate change and transforming into extreme meteorological phenomena such as extreme dry and hot periods, wildfires, windstorms, torrential rain, floods, heavy snowfalls, etc. Adaptation measures reduce these climate changes, and special landscape maintenance and changes are part of the application of the Smart concept. The quality of life reflects the feeling of life satisfaction and social stability, which is influenced by a range of material and non-material factors, such as living, services for citizens (mainly public services in the sphere of education system, health service, social service, etc.), the level and the possibility to deepen the social and human capital, leisure time facilities (sports, culture or creative facilities, tourism, natural environment), etc. The sphere of **People and Living** can be extended by features such as the Internet of Things, IoT, or the issue of acquiring, processing, storing and handling with personal data. This sphere is closely connected with the sphere of **Community** and civil society, where the emphasis is put on a community of people identified with the concrete ideas. These people – active citizens show interest in the public life and are motivated to share their opinions and advance their attitudes in communal and regional space. An ideal mature, modern, cosmopolitan society searches the ways how to secure the social and ethnic plurality, how to support equal opportunities and prevent the social exclusion, how to prevent the deprivation, exclusion and segregation. The key part when fulfilling the objectives in these two spheres is sharing the ideas and mutual and open Smart communication among all involved subjects, which is the basis for searching material innovative solutions and outputs.

Security is a broad sphere concerning the securing the systems against the threats and risks. In regards to the concrete systems (social, technical, information, natural, and others) securing the safety is specified in individual measures. A complex approach towards securing the required level of safety and justice is stipulated in the legislative standards and other relevant documents, and is enforced and secured by security services (police, army). At present, ways of protection against criminality, extremism and terrorism are searched for to secure the general safety, and new defensive and safety systems and structures are developed. Alongside with the expansion of data use and information and communication networks, it is possible to search for possibilities how to improve the reliability and safety of network systems, and improve the data protection in the dynamic environment.

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The sphere of **Mobility and Transport** is one of the most potential spheres in which the Smart concept can be applied, predominantly in the technical and technological sector. A general requirement of all subjects is to secure the required accessibility of places. For this reason, it is essential to constantly innovate organisation, information and operating systems of transport and create conditions for the development of integrated mobility based on intelligent and secure transport systems with elements of autonomous operation that respect the protection of the environment and sustainability. New modern trends in transport rely on searching for alternative means of transport based on ecological and renewable energy resources, and are nowadays projected in the development of electromobility. The innovative approach in transport and mobility not only concerns the means of transport or systems, but also the transport networks, their operation securing, the quality of used material, management of their repairs or building of new ones, etc.

Another essential sphere contributing to the regional development and coordination of public activities is the transparent **Governance**. This sphere is significantly determined by the level of participation of the population in the decision making, administration and governance, in regards to the stipulated political strategies. Self-government and general governance should be in charge of the given region and control it sustainably with respect to the required quality and accessibility of the public goods and services. As it was mentioned above, the cooperation and collaboration (involvement) of citizens with the representatives of the self-government and government is fundamental, including the so-called Public Private Partnership (PPP), which is typical for its active partnership between the public and private sector and information transparency. At present, this sphere is connected with processes of de-bureaucratization on one hand and digitalization, eGovernment and open data on the other hand. Smart concepts applicable in the regional processing of administration are usually related to the communication across the involved subjects when deciding, choosing and securing the public goods and using information and communication technologies in order to reach the citizens faster and more cheaply.

Economy and Business is a primary sphere that creates conditions for economic development in the regions, which is then reflected in the regional competitiveness and determines the living standards of the local population. The Smart business environment is typical for its innovative and creative spirit, flexibility and adaptability, initiative and entrepreneurial spirit (transferring ideas into practice), investments into human capital and production of the processes and procedures that are effective and sociably responsible. The production of safe and reliable products is supported, and their utility characteristics or their versatility is strengthened. Successful companies are open to new trends and cooperation, they benefit from sharing information, experience and skills and profit from the cooperation across sectors and institutions (especially through technological parks, incubators, branch clusters, technological platforms, etc). The cooperation with universities and research institutes is also significant.

An equally important sphere is **Infrastructure** in its broadest sense. Apart from the standard transport, energetic, water and sewage system, its subject of interest is nowadays information, communication and knowledge infrastructure. Reliability, safety and resistance (lifespan) of distribution networks and service systems is nowadays a priority fo all types of infrastructures, or rather the protection of critical infrastructures and securing of required capacity of backbone transmission networks, mainly of the power industry. This is reflected in creating new intelligent network systems that rely on the development of information and communication technologies and in applying technological innovations regarding the materials and procedures used. Administration and management of infrastructure networks, their diagnostics and continuous inspection leading to the increase in reliability, safety and lifespan of infrastructure systems is an important activity.

3   Smart City

A Smart City in one of the concepts how to apply the principles of sustainability into the organization of the city and is based on the application of modern technologies, especially information and

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communication technologies, with the aim to improve the quality of life and increase the efficiency of public administration (MMR ČR, 2015). Smart City is typical for its active innovative solutions applied in its region which enhances the quality of life of its population, when the innovation and innovative concept is the core of the concept of the Smart City. Smart City together with Smart Regions represent a new economic branch within which new markets or segments of markets with innovative and intelligent (both material and non-material) solutions for the given cities and regions get developed. The role of domestic, especially small and middle-size enterprises, is significant and they activate within the concept of Smart City a large number of opportunities for the development of their entrepreneurial activities (MH SR, 2018). The European Commission (2012) defines the Smart City as a city that makes use of its traditional networks and services more effectively than other cities, as its development is based on the digital and telecommunication technology, which has a positive influence not only on the local population but also on the business environment. We can add a definition according to Northstream (2018) who defines Smart City as a city that uses innovations and technologies for sustainability, effective use of resources and a higher quality of life for its citizens.
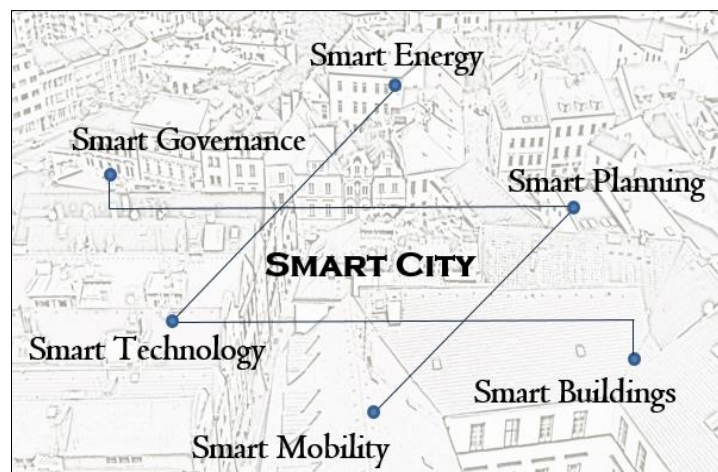

Fig. 2. Concept of Smart City (Source: own processing)

For the concept of Smart City, six components are essential (see Fig. 2) that support the concept. In each of them, the partnership between the concrete subjects is reflected with a various intensity. The public sector is represented by the management and employers of the specific cities (local governors and mayors), representatives of government institutions and upper self-government institutions, partly universities and research institutions or other educational organization. The private sector is represented by both domestic and international entrepreneurs, and various entrepreneurial associations, and the local community is represented by representatives of citizens, interest associations, civic organizations and visitors. The principal components of Smart City are: (1) Smart Governance, (2) Smart Energy, (3) Smart Planning, (4) Smart Building, (5) Smart Mobility a (6) Smart Technology. Smart City thus symbolizes an environment suitable for innovation, protection and safety, equal access to services, sustainable mobility and transport, use of green energy and renewable resources and others, which contributes to a higher quality of life and entrepreneurial environment.

Smart City flexibly responds to the changing needs and provides incentives for its citizens to exercise their talents, helps a communal life and supports the development of the local economy. This gets reflected mostly in technical trends of the Smart City which is digitalization, administration of data and open data (together with eGovernment), internet of things, internet platforms, information and communication means, etc. Approaches towards the Smart City are not only technical, but also technological, non-technical and the one based on cooperation. Nowadays, all of these physical and

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electronic endowments belong to the growth factor of territories, therefore Smart Cities too (Melecký, 2018). At present, Smart Cities are mostly focused on concepts that increase the energetic effectivity, improve electronic services provided by the self-government, and on intelligent transport and parking systems (MH SR, 2018).

4   Smart Region

If we assess the Smart Region from the geographical-spatial point of view, we approach the concept more broadly than with the Smart City where the concept is primarily focused on the settlement areas with a high population density and extensive infrastructure of offered services. Smart Region then represents a larger region where cities and municipalities are concentrated and where the Smart approach is applied for their management and solving of economic-social issues. The concept of Smart Region supports (1) the existence of Smart Cities and Smart Villages, (2) innovative (interdisciplinary) approach regarding the landscape and its maintenance in order to preserve or enforce its natural functions and services (Smart Landscape), (3) an application of sustainability in all spheres of the region in order to secure the permanence and diversity of systems, resources and processes in the region (Smart Sustainability), (4) creation and enforcement of conceptual tools of planning urbanistic settlements and landscape with respect to the support of the regeneration of brownfields against the undesirable housebuilding on the green field (Smart Growth), (5) creation of smart, secure, reliable systems with enough capacity, using solar, wind, water, geothermal and other alternative renewable resources (use of waste and biomass), mainly energetic, including the enforcement of utility values of products (Smart Sources Renewable), and finally (6) it is a sphere of technical and non-technical infrastructure (Smart Infrastructures) which generally interconnects various structural material and non-material elements. Most often it is technical (water lines, sewage systems, etc.), energetic or transport infrastructure that are all connected to information and communication technologies, adaptation or change of technological processes and input materials, while with non-technical infrastructure (entrepreneurial, infrastructure of research and development, infrastructure of public facilities and others) the innovations regarding communication and information sharing, cooperation and partnership are crucial as far as Smart concept is concerned (see Fig. 3)
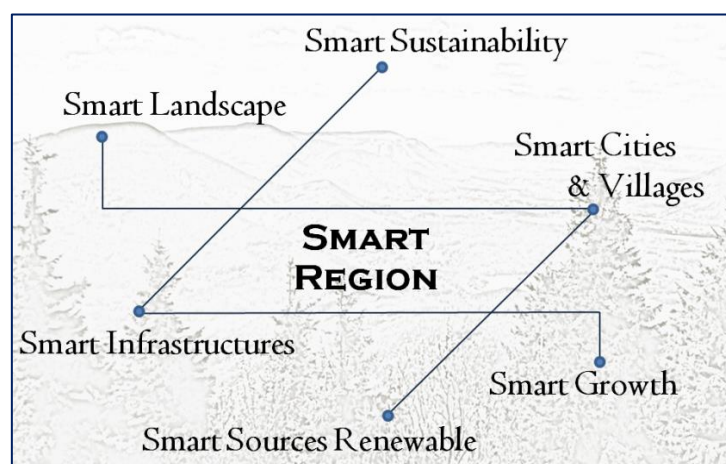

Fig. 3. The concept of Smart Region (Source: own processing)

The above mentioned six spheres of Smart region mutually overlap and are interconnected in a range of details, and it is not possible to define the boundary where the one sphere finishes and the other begins. Generally, we can perceive Smart region as the one in which the subjects actively and responsibly approach the solution of the local issues and needs, and search for new and effective ways how to overcome the undesirable condition with respect to the sustainable regional development

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(Sucháček, 2013), sustaining or improving the natural functions and services of the landscape, continuity in the society development including permanent deepening of the quality of infrastructure networks, always with regard to the environment and social stabilization of the given region. Just as in case of Smart City, Smart Region is also a place where all generations of people like to live as they can feel here an above-standard quality of life, both knowingly and unknowingly.

5   Conclusion

The level of progressiveness and smart-readability belongs to important indicators influencing the socio-economic development and other processes taking place in the social and economic realm (Staníčková, 2017). The social development in the last decades has been closely related to the transition from industrial economy to modern economy associated with a prevailing proportion of services, and recently also to knowledge economy based on the development and utilization of knowledge, skills and innovative potential.

The knowledge economy is just based on the knowledge society, uses its predominantly non-material assets to increase the productivity and creating social benefits across all spectra of economic activities and social life, and is thus a significant source of competitive advantages in all spheres of economy and a quality of life for the citizens of its country. It is the concentration of economic, social and cultural activities that, together with a creative and knowledge potential of the residents of the cities and regions, represents the driving force for the development of innovations, new technologies and overcoming of challenges (mainly of environmental character) that the present society is confronted with.

6   Acknowledgements

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EDUCATION AND UNPAID WORK - SELECTED IMPLICATIONS FOR THE LABOUR MARKET

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Abstract
Education is often associated with human capital, its enhancement, and it is also considered to be an important assumption of employability in the labour market. Attention of economic theory focuses mainly on the positive benefits of education both for individuals and for society. However, there are only few studies focusing on the wider approach to education as a factor that can affect not only paid work and income, but also unpaid work. The main purpose of the contribution is to reveal a relationship between the education and unpaid work. Contribution is based on the data from the original field research, which was conducted in 2016 in Slovakia. Within the field research, we questioned 1743 households and 4818 individuals. Using the correlation analysis, we analysed relationship between the unpaid work and education, paid work, income, age groups and status of activity (employed/ unemployed). Results prove that unpaid work, its structure, and extent, are strongly influenced by economic factors as well as by non-economic motives. It seems to be necessary to consider unpaid work as a part of informal education. Our findings try to help policymakers to understand importance of the unpaid work for increasing preparedness of human capital for labour market.

Keywords
Education, Informal Education, Paid Work, Slovak Households, Unpaid Work.

JEL classification
I25, E24, J01, J22, J24

1 Introduction

The issue of education and human capital is now an integral part of the modern concept of economics. One of the most important theoretical currents of economic theory that reflects the issue of education is the theory of human capital. The theory of human capital will also be a fundament in discovering the links between education and unpaid work in this contribution.

The development of the economy and society is highly conditioned and limited primarily by education, its quality and the level of professional training of workers, which affects the overall creation of human capital in society. According to human capital theory, people are investing in education, training and other activities to increase their productivity and consequently a lifetime income. Several areas concern on education as a major factor in human capital formation and its evolution. As empirical findings confirm, knowledge, skills, and knowledge-related skills are relevant not only for job performance, but they also reduce the risk of social exclusion, increase the level of income from work, greatly affects social behaviour, and increase the efficiency of investing in human development capital. These include, for example, individual preferences, living conditions or decision-making based on available information on health, humanity, the environment, parental behaviour (Porubčinová, 2011).

In this paper, we focus on the interrelationship between education and unpaid work. Unpaid work is performed daily by each person within the own household or for other households without having received any financial reward for this work. We believe that by revealing close links between

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education and unpaid work, considering various determinants of unpaid work, we can more fully assess the benefits of unpaid work and discover hidden potential that it has. Unpaid work can be considered as a generator of acquired knowledge, experience, or skills that individuals can use to maintain or develop their human capital and redevelop them not only in the family environment (in the home environment) but also in paid work.

2   Literature review

Education is an important factor of the production performance of the country and the source of the wealth of the nation. Representatives of classical economics (Adam Smith and others) pointed out the socio-economic significance of education and its economic context. Later, the authors of human capital theory (such as T. Schultz, G. Becker, J. Mincer) and their followers stressed the importance of education. Education contributes to increasing labor productivity, participates in the development of personality and society as a whole, and also contributes to reducing social inequalities.

As shown by a series of empirical studies (e.g. World Bank, 1999; OECD, 1998; Mankiw et al., 1992; Barro, 2013), human capital is a stimulus to economic growth in standard economic models because it is one of the input factors of goods production and services. There is, therefore, an obvious positive link between the level of education of the population and the growth of gross domestic product (it can be, moreover, apply in both directions). A certain amount of human capital contributes to economic growth and economic growth is often considered to be a motive for investment intended to create and accumulate human capital (due to the greater amount of funding available, also with an intention to increase the motivation of individuals to participate in training and education).

Human capital is an economic category for designating the knowledge and skills of the worker (Keeley, 2007). However, it has also significant non-economic overlaps and it is therefore the subject of other science studies. One of the main attributes for increasing and developing human capital is education (or process of education). Economic theory interprets the process of education as a process of investing in human capital. Individuals are free to decide on their education by comparing their costs and returns and benefits. (Benčo, 2002; Čaplanová, 1999; Blundell et al., 1999).

Education of individuals has a significant impact on the quality of labour supply. The adaptation of individuals to the labor market is the subject-matter of economic theory and empirical studies. The mainstream of economic theory focuses mostly on those human activities that are linked with paid work (it means those activities that allow persons to find job at the labor market) and can be relatively easily included in the system of national accounts and economic aggregates. Areas of human activities that do not involve financial transactions do not primarily and explicitly deal with economics (Johanisová and Fraňková, 2009). However, the importance of a non-monetary economy for human satisfaction and its underestimation by economic mainstream is borne out by many authors, especially authors who define themselves as critics of the mainstream economic models. The American authors Goodwin (2017) and Cahn and Gray (2005) for the non-monetary economy use the concept of "core economy", or a "nuclear economy". If we deal only with the money economy (goods and services that are exchanged for money), we could mistakenly identify wealth and prosperity with an increase in the total volume of the production. At the same time, we would underestimate or ignore the existence of non-monetary goods and services that meet the important needs of people (Johanisová and Fraňková, 2009).

Returning to the concept of human capital, it is useful because of bringing new insight into education in economic thinking. Human capital theories consider education as something productive, which will increase the value of the workforce and allow greater productive efficiency. The educated population is desirable, not only in terms of the economic but also of the general human perspective. The definition of human capital is not fully understood. In the main stream, it is basically identified by investments in education or in individual health (Kameníček, 2003). Mankiw et al. (1992) defines human capital as an accumulated amount of labor force investment, such as education or work experience. Holman (2008) identifies human capital only with the education. This approach is not

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unique; human capital is often associated only with formal education, that is, education that goes through the framework of the monetary economy and can therefore be expressed financially.

Education itself is, however, a much wider concept, involving much more than just institutional vocational training or education aimed at obtaining the relevant education or professional qualification. It is necessary to include in education not only training and institutional education, but also activities aimed at developing key competencies, value orientations, practical skills and abilities. The sphere of education is an area where the complex integrity of human personality is formed. In addition to formal education and training, people acquire both non-formal and informal education (La Belle, 1982; Schugurensky, 2015; Tripon, 2014).

Education and human capital generally do not only affect the labor market, but also the function and status of individuals, families and social groups in the society. Therefore, it is important to include not only the area of productive (paid) work, but also the sphere outside the classical monetary economy when considering the activities carried out within the national economy. This non-monetary sphere includes those human activities that can be called "unpaid work". In general, unpaid work is a work (it means human productive activity) for which an individual receives no remuneration in the form of wages (Antonopoulos, 2009; Hirway, 2015; Považanová and Nedelová, 2012).

To uncover the links between education and unpaid work, wider insight into education is essential and useful. Several activities carried out within the unpaid work contribute to the development of practical skills and abilities, thus increasing the level of informal education of the individual. Therefore, the overall level of education (of individuals and of the population) is rising, which has a positive impact on the creation of human capital in the society and on the increase of the productivity of the economy. Discussions on the value, quality and need for unpaid work are particularly important in the context of higher education; in which it is expected to educate graduates with adequate skills and dispositions to ensure economic development (Wyn, 2009; Hart et al., 1999).

Unpaid work is closely related not only to the quality of life, satisfaction and individual welfare, but also to the factors that form part of human capital theory such as education, personal income, employment, unemployment and others. That is why it is necessary to examine the link between the education and unpaid work, incorporating other determinants that are a link between human capital and unpaid work. Repeated researches carried out since 2012 in Slovakia within VEGA projects (VEGA no. 1/1141/11 "The Labor Market in the Specific Context of the Unpaid Work, the Measurement of Unpaid Work Value and its Impacts into Households, the Business Sector and the Economy, VEGA no. 1/0935/13 "Unpaid work as a potential source of socio-economic development of society and the determinant of individual well-being", and VEGA no. 1/0621/17 "Decision-making Process of Slovak Households on Allocation of Time for Paid and Unpaid Work and Household Strategies' Impact on the selected areas of economic practice") clearly confirmed that the scope, structure, motives and expectations of the trend of unpaid work in Slovak households are significantly influenced not only by education but also by income, age, sex or status of activity (employed, unemployed) of the individual. However, in this article, we focus specifically on the relationship between the education and unpaid work, considering unpaid work as significant part of the informal education of an individual.

3   Methodology and data

Within the framework of the VEGA research and development projects (previous projects VEGA, 2011, VEGA, 2013 and current project VEGA, 2017), we distinguish eleven activities that are included in the unpaid work. These activities are food preparation, housekeeping - cleaning, preparation and maintenance of cloths, growing ornamental plants, pet care, preparation and maintenance of equipment, shopping and services, growing agricultural plants, breeding farm animals, building and reconstructions, children care, adults care, and volunteer activities. At the same time, selected determinants (education, age, gender, income, activity status, number of members in households, etc.), which affect the amount of time spent by unpaid work, have been observed.

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The aim of this article is to identify relationship between the unpaid work and education and to consider unpaid work as a possible source of the informal education. In the article, we are using data from the original field research, which was realised in 2016 by multidisciplinary team from the Faculty of Economics, Matej Bel University in Banská Bystrica, Slovakia. The research focused on identifying opinions and circumstances influencing paid and unpaid work of households, as well as of members of households (individuals, respondents). Within the research, we questioned 1743 households and 4818 individuals (members of the households). Research was adequate and representative according to the number of members of households, according to the number of households in regions (in case of questions and answers concerning households) and according to the gender and age (age categories) in case of questions and answers concerning individuals.

Based on selected theoretical approaches of domestic and foreign authors on human capital, education and unpaid work, and based on primary research data on unpaid work, we formulate a research assumption that there are close links between education and unpaid work (influencing each other in both directions). We assume that formally acquired education significantly affects the extent of unpaid work performed by individuals and at the same time unpaid work allows the acquisition of specific skills that an individual can use in paid work.

We used statistical program IBM SPSS 19 to process data from our questionnaire survey. We verify the interdependence between the unpaid work, education, and selected determinants by a nonparametric correlation using the Spearman coefficient at a significance level of 0.01.

4   Empirical results

By using the logistic regression, at the level of significance $\alpha = 0.5$, we verified the impact of the completed level of education on the extent of the unpaid work performed by the individuals. The amount of unpaid work is expressed in hours per week. Results are displayed in table 1.

Table 1. Extent of unpaid work according to the completed level of education (hours/ week)

Level of completed education	Mean	N	Std. Deviation
Without fulfilled education	10.1304	633	35.80757
Primary education	23.3084	345	53.60976
Secondary education (less than 4 years)	35.3172	660	34.62637
Secondary and post-secondary education (at least 4 years)	36.2368	1497	44.46881
Post-secondary education, conservatory, advanced vocational training (more than 4 years)	42.9886	208	41.95002
Higher education (1, 2 and 3 grade)	36.5246	1432	42.99638
Total	32.0971	4775	43.35723

Source: own data processing in SPSS program.

Not all of 4818 respondents answered the question about the completed education, that is why we included only 4775 questionnaires into the calculation. The highest extent of unpaid work is performed by persons who completed post-secondary education and advanced vocational training (almost 43 hours/ week). Individuals with higher education and secondary education spend more than 36 hours per week by performing unpaid work. It is interesting, that persons with lowest completed education spend the less time by unpaid work. We confirmed by our previous researches, that extent of unpaid work depends not only on economic factors (such as income, paid work, education and economic activity), but also on non-economic factors (such as traditions, family customs, family preferences, etc. (Kika and Martinkovičová, 2012). It is probable, that mostly persons with completed

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secondary and higher education focus more on non-economic factors influencing extent of unpaid work (we assume that their education allows them to participate on labour market and to acquire adequate job with adequate wage). On the other side, persons without education or with just primary education could face existential problems, which influence also their attitudes towards the activities performed outside the paid work. It is, however, evident that level of completed education influence extent of unpaid work that individuals perform in their own or in other households.

By the means of Spearman correlation, we analysed relationship between the education, unpaid work, age category, net monthly income, and status (employed/ unemployed). Results of Spearman correlation are displayed in Figure 1.

Correlations			unpaid work	net monthly income	education	status of activity (employed/ unemployed)	age category
Spearman's rho	unpaid work	Correlation Coefficient	1,000	-,077**	,147**	-,027	,147**
		Sig. (2-tailed)	.	,000	,000	,132	,000
		N	3208	2997	3201	3186	3208
	net monthly income	Correlation Coefficient	-,077**	1,000	,357**	,594**	,240**
		Sig. (2-tailed)	,000	.	,000	,000	,000
		N	2997	2997	2990	2975	2997
	education	Correlation Coefficient	,147**	,357**	1,000	,446**	,365**
		Sig. (2-tailed)	,000	,000	.	,000	,000
		N	3201	2990	3201	3182	3201
	status of activity (employed/ unemployed)	Correlation Coefficient	-,027	,594**	,446**	1,000	,277**
		Sig. (2-tailed)	,132	,000	,000	.	,000
		N	3186	2975	3182	3186	3186
	age category	Correlation Coefficient	,147**	,240**	,365**	,277**	1,000
		Sig. (2-tailed)	,000	,000	,000	,000	.
		N	3208	2997	3201	3186	3208

**. Correlation is significant at the 0.01 level (2-tailed).*. Correlation is significant at the 0.05 level (2-tailed).

Fig. 1. Spearman´s correlation (Source: own data processing in SPSS program)

Spearman´s correlation confirmed positive relationship between the education and unpaid work (higher the completed education, the more time individual spends by unpaid work). However, this correlation is only weak. Regarding relationship between the education and other factors, we confirm positive correlation in all cases. In case of relationship between the education and age categories, correlation is only weak. Correlation between the education and status of activity (employed/ unemployed) is the strongest. It is logic, because better education means higher possibility to find job and to get more stabile and permanent job (e.g. full-time job comparing to part time job, employment contract comparing to job agreements). Positive correlation exists also between the education and net monthly income (higher the completed education, higher the net monthly income). It is again linked with ability of well-educated persons to apply for better job position (it means also better paid jobs).

In this article, we try to identify relationships between the education and unpaid work. Because of the positive correlation between the education and net monthly income and status of activity, we analysed also relationship between the net monthly income and unpaid work, and status of activity (employed/ unemployed and unpaid work). According to the Spearman´s correlation (figure 1), there is negative, however only weak correlation between the net monthly income and unpaid work (higher the income, less the time individual spends by unpaid work). In the table 2, there information about

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the average time per week, that individuals in various income groups spend by performing unpaid work.

Table 2. Extent of unpaid work according to the income groups (hours/ week)

Net monthly income	Mean	N	Std. Deviation
without income	31.3714	482	54.06247
up to 200 €	54.3175	99	76.85097
from 201 to 400 €	58.9506	301	61.12152
from 401 to 600 €	37.6530	671	33.51482
from 601 to 800 €	34.3979	653	43.24921
from 801 to 1 000 €	32.6169	497	45.91855
from 1 001 to 1 500 €	28.1808	312	26.80702
above 1 500 €	27.2508	174	30.82467
Total	36.2937	3189	46.03942

Source: own data processing in SPSS program.

Individuals without any income spend the less time by unpaid work. These persons focus mostly on struggle for existence and they are not interested in various aspects of life. When considering people with income, higher the income, less time they spend by performing unpaid work. It can be linked with more possibilities for substituting unpaid work activities by market services. It was confirmed also by our previous researches (Uramová et al., 2015). It is, however, interesting that also persons in the highest income groups spend significant amount of time by performing unpaid work (almost ¾ of the time they spend in paid work). Also, in this case, non-economic reasons for performing unpaid work dominate over economic factors (Kika and Martinkovičová, 2012).

According to the Spearman´s correlation (figure 1), there is weak negative correlation between the status (employed/ unemployed) and unpaid work. In the table 3, there are data on extent of unpaid work performed in average by employed and unemployed persons.

Table 3. Extent of unpaid work according to the status (employed / unemployed) (hours/ week)

Status	Mean	N	Std. Deviation
unemployed	42.7270	797	57.36388
employed	34.2636	2586	41.17892
Total	36.2579	3383	45.64617

Source: own data processing in SPSS program.

Unemployed persons spend more time by unpaid work than employed persons. Unemployed persons have more free time which they can dedicate to unpaid work. They also belong to the lower income groups (and we confirmed that lower the income, more the time persons dedicate to unpaid work). In many aspects, it is a positive finding, because it is important that unemployed persons perform at least some work (so they can maintain at least some working habits).

5   Conclusion and discussion

In the context of an increasingly competitive and uncertain dynamically changing labour market, unpaid work is becoming more and more common in various areas of life. An importance of the unpaid work, in our opinion, is not only in securing standard household existence, but also in the development of practical skills and abilities of individuals. These skills and abilities, acquired from the childhood up to the adulthood, may employers find desirable when looking for possible employees at labour market. So far, relatively little empirical attention has been paid to the importance of unpaid work for acquiring working skills and habits suitable also for labour market (as a form of informal education).

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In our article, we tried to stress an importance of the unpaid work and its relationship with the education and the ability to acquire adequate job on labour market. The findings bring interesting insights into the context of education and human capital in the bond of unpaid work. The overcrowded and highly competitive labour market is showing increasing pressure to complement the theoretical knowledge gained through formal education with practical experience in the real world. One of the ways of gaining such experience is also seen in the area of unpaid work. The advantages of the performance of unpaid work are in improving the employment perspective through the development of interpersonal, social and professional skills. These findings are also reported by other authors (such as Gault et al., 2000; Knouse and Fontenot, 2008).

Skills acquisition can be considered as a form of informal learning that exploits human capital. Concerning the wider links between the human capital, education and unpaid work, there is a clear link between the paid work and unpaid work (and consequently between the monetary and non-monetary economies). This connection can be considered as a transfer of knowledge, experience, skills from paid work to unpaid work (for example, the doctor can use his / her experience in family care, child care, etc.), but also on the use of experience and habits from the unpaid work in paid work (organization of time, division and management of activities, tolerance, consideration of individual needs, etc.).

Our research is, however, limited by lack of empirical data concerning the unpaid work as part of informal education. It is not possible to identify directly influence of the extent of unpaid work on the ability of individual to gain a paid work. It will be necessary and interesting to extend our research by additional questions concerning the attitudes of respondents towards the importance of the unpaid work on their ability to get better job at the labour market. In the article, we tried to identify relationship between the education and unpaid work, and consequently between the income groups and status (employed/ unemployed) and unpaid work. These are the most important attributes of the labour market and we consider necessary, that local governments as well as national policies focus more on the advantages and importance of the unpaid work in preparing individuals for the labour market.

6   Acknowledgement

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TAX TREATMENT OF SELF-EMPLOYED AND EMPLOYEE INCOMES

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Abstract
The comparable amount of the overall taxation of the incomes of self-employed, employees and single directors is significantly influenced not only by tax rates, but also by the assessment bases for income tax and social security contributions. Unlike western countries, we have a low tax rate on the income of natural persons and a high burden on work through social security contributions, the lion share of which is paid by the employers. The prerequisite for the effective solution of the problem of the overall taxation of self-employed includes clarification of the concept for financing social security, from which the expediency of combining the current taxation of personal incomes with the social security contributions paid by employees becomes apparent under Czech conditions. At the same time, this will also involve a necessary increase in the tax rates for self-employed and single directors. The rate of the social security contributions paid by employers and self-employed may be differentiated on the grounds of the lower scope of social security provision for self-employed, but this is not necessary under Czech conditions. The allowance for employee benefits (in particular paid leave) provides justification for the reduction of the assessment base for self-employed social security contributions to below the level corresponding to the share of an employee gross wage in the total labour costs.

1   Introduction

After the Velvet Revolution, Czech self-employed experienced significant concessions regarding their social security contributions, mainly thanks to the efforts of the former Association of Entrepreneurs of the Czech Republic. There was a certain historical logic to this: it was the interest of the state to develop entrepreneurship, while self-employed were interested in minimising their social security contributions even at the price of lower pensions and other social security benefits.

Subsequent reforms to social security and income tax have not brought any essential changes in this area. This state policy has resulted in a situation where we now have relatively more self-employed than western countries and these self-employed pay on average significantly less income tax and social security contributions than employees. Not only the OECD recommended eight years ago that we should increase the overall taxation, including social security contributions, of self-employed. The research question which we have posed here involves estimating the optimum amount and relation between the income taxation (including social security contributions) of employees and self-employed under the current Czech economic and social conditions.

2   Literature review

The current Czech system of personal income tax and social security contributions is the result of a incomplete wave of tax and social reforms of a neoliberal type. Like most post-Communist countries, we have very low income taxation and very high social security contributions when compared with more advanced countries.

As far as income taxation is concerned, these countries have endeavoured to proceed from the Hall-Rabushka modified neoliberal tax concept, which replaces generally forced universal consumption tax – for practical reasons – with two taxes at the same rate: the individual wage tax and the business tax, albeit that each of them only taxes a given part of the value added; the proposal has

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been presented in the USA as an essential simplification of these two taxes. For all that, however, both the existing taxes have been appropriately "modified" in the spirit of neoliberalism. Individual income tax is intended to only tax wages, but not capital incomes. At the same time, Hall and Rabushka "omitted" tax deductions for the payer and his or her family from the existing personal income tax so that this has resulted in a progressive flat tax. Their business tax does not deduct interest from the tax base and on the contrary it fully and immediately deducts investments (in the place of depreciation). Both taxes were intended to have the same, flat tax rate, that being 19%. The flat rate links these two taxes: "Our flat tax adheres to the principle of a consumption tax: people are taxed on what they take out of the economy, not on what they put in." (Hall and Rabushka, 1985) Social security contributions are not part of this income taxation concept; the neoliberal model expects that social security should be privatised and that employees should pay the contributions for it from their after-tax earnings. In Czechia, employees pay (low) social security contributions after tax; however, the privatisation of social security has not occurred (with the exception of the episode involving the introduction of voluntary pension savings in 2013-2016). Our high employer social security contributions date from the period of the first tax reforms at the beginning of the 1990s, when the tax authorities presupposed the renewal of Bismarckian social insurance.

Czech income tax and social security contribution reforms have never gone far to a single, comprehensive system (model). The government has implemented the neoliberal concept of taxing the supergross wages of employees since 2008: the tax base is the sum of the gross wage and the social security contributions paid by the employer. The supergross wage is, roughly speaking, identical to the excess of earnings over and above expenses (profit) in the case of self-employed (provided the self-employed pays social security contributions at a comparable amount). The rate of this income tax for natural persons is low (15%), the tax rate also applies to interest, dividends and other capital incomes. This proved to be a problem for the recent income tax reform proposed by the Minister of Finance (Schillerová, 2018), which endeavoured to abolish the taxation of the supergross wages together with a reduction of the effective taxation to 19% of the gross wage. The simple application to the earnings of self-employed and capital incomes would have led to an increase in the degree of taxation on these incomes and this is precisely what eventually "brought the proposal down". In the case of self-employed, it was possible to resolve the problem with the somewhat tortuous reform of the assessment base for social security contributions (the Minister also endeavoured to do this), but a similar "solution" is not possible in the case of capital incomes.

The assessment base for the social security contributions of Czech self-employed, which was expediently reduced to 35% of the profit in 1993, was gradually raised to 50% in 2004-2006. In 2000, the OECD recommended that we should raise this to 65% with the justification that 65% broadly corresponds to labour's share in the value added (OECD, 2000). To date, the current main priorities for tax reform include:

- eliminating the tax bias in favour of self-employed work forms;
- lowering social security contributions and increasing reliance on the personal income tax system. (Bronchi and Burns, 2000).

The taxation of self-employed earnings in Sweden is designated as neutral in relation to employee earnings (Hansson, 2008). Both these types of income are subject to a proportional (around 32%) rate of regional income tax, while the tax base for employees is their gross wage and for self-employed it is their excess incomes over and above their expenses. (The state tax on employee and self-employed incomes is in fact merely a supplementary tax, it only pertains above-average incomes, the tax deduction for the payer is higher than the average wage in Sweden.) On the other hand, "self-employed have arguably greater opportunities than wage earners to underreport their incomes." (Engström and Holmlund, 2009) As far as Swedish social security contributions are concerned, the employer pays 31.42% on wages and the self-employed pays 28.97% on profit in 2018; the lower rate for self-employed is justified by the lower scope of their social security.

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An analysis undertaken by the Association of Small and Medium-Sized Enterprises and Self-employed of the Czech Republic has reached the conclusion that self-employed in our country pay less than half the income tax and social security contributions in comparison with employees. (AMS, 2015) At the same time, the Association also pointed out that self-employed have a lower level of social security, they have no entitlement to paid leave and they bear the entrepreneurial risk.

In an international comparison, the taxation of the incomes (including social security contributions) of self-employed in Czechia is the second lowest among 24 European countries just behind the tax haven of the Isle of Man (AGN, 2017). According to this comparison, the highest income tax on self-employed is levied in Germany; Sweden is in 18th place and Great Britain is in 9th place. These results are partially influenced by the selection of the typical self-employed, who is a married man with two children.

The OECD has also called upon the British government to eliminate the tax bias in favour of self-employed: „to improve fairness in tax policy and reduce risks for the financing of the social insurance system, the authorities should gradually reduce the gap between NICs for self-employed and employees." (OECD, 2017)

The preference for self-employed in the tax treatment has wide-ranging consequences, including for the state budget. And that is not to mention the developing "gig economy", if its protagonists evade the payment of tax thanks to the sluggishness of the public management's reaction to new digital business platforms. The comparison of tax treatment of employees and self-employed in Great Britain also considers a third group of workers, who have established corporations for the purpose of reducing their tax burden and who take their earnings in the form of dividends. „People respond to tax incentives … Even so the OBR has warned that we are on course to lose £3.5 billion of tax revenue by 2021 because of more incorporations. It also reckons that we will lose an additional £1 billion of tax revenue because of further increases in the number of self-employed. That's because owner managers and the self-employed pay a lot less tax than employees." (Johnson, 2017) Despite all of the stated knowledge and the OECD recommendations, the British government has deferred its own published proposal for highly incremental increases in national insurance contributions (NICs), which Johnson has designated as mere "baby steps".

3   Methodology and data

The British comparison of the tax treatment differentiates between three workforce categories: employee, self-employed and single director (company owner-manager). Figure 1, created by the OBR (Office for Budget Responsibility), sets out the types and amounts of the individual taxes calculated for an annual income of £50,000 in the 2017/18 fiscal year. The OBR data substantiates the significance of the tax optimisation of the three stated workforce groups. The practical result of this tax optimisation involves the existing tendency for increases in the number of self-employed and increases in the transformation of self-employed into limited liability companies (incorporations) with a minimum number of employees (1-2), whereby the self-employed is the single director.

In this article, we will create a similar comparison of three groups in the Czech workforce, namely in a variant form, whereby we will take into account the option of choosing the assessment base (the gross wage versus the minimum) in the case of social security contributions (SSCs). Thus, we overlook the fact that the absolute majority (approximately 90%) of Czech self-employed do not in fact pay any income tax (this involves the manipulation of income data which we will not deal with here). We will further endeavour to project paid leave and other employee benefits into the previous analyses.
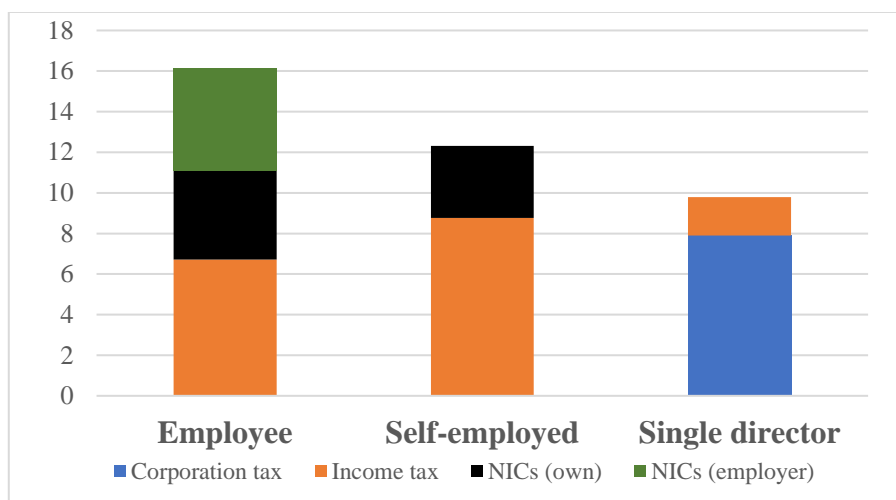
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Fig. 1. Tax due on £50,000 of income in 2017-18 (Source: OBR, 2017)

In conclusion, we will take into account the need for the reform of Czech personal income tax based on the essential fundamental rationalisation of the financing of social security, which will result in the incorporation of employee social security contributions into personal income tax. (Vostatek, 2018) Here too, we should be able to refer to the British analysis: „For decades voices irrespective of political hue have proposed the merger of National Insurance Contributions (NICs) and Income Tax. Despite the rationale of simplification, transparency and fairness, it has yet to happen. … Employee NICs and Income Tax on earnings should be replaced with a single Earnings Tax, ideally set at 32%, 42% and 47%, based upon today's Personal Allowance and three marginal Income Tax bands." (Johnson, 2014) "National Insurance is not a true social insurance scheme; it is just another tax on earnings, and the current system invites politicians to play games with NICs without acknowledging that these are essentially part of the taxation of labour income. The two systems need to be merged." (Mirrlees et al., 2011) The compared variants make use of the average gross national income at the amount of the general assessment base for pension insurance which is valid for 2018; i.e. specifically CZK 29,979 per month. This involves model calculations for a single childless taxpayer. We will not discuss the issues of the tax deductions of expenses or the value-added tax.

4   Empirical results

Our initial analysis of the tax treatment of an employee, a self-employed and a single directors in Czechia includes two variants for the behaviour of the self-employed: the theoretical variant involves the case where self-employed pay social insurance contributions "at the full amount" (29.2% on half their profits), while we have designated the payment of the minimum insurance contribution (29.2% on quarter of their profits) as the practical variant. At the same time, the profit has been modelled here as being equal to the supergross wage of an employee. The self-employed does not pay sickness insurance contributions here. In the model, the single director only pays corporation tax and dividend tax – just as in Figure 1. The results of the calculations are displayed in Figure 2.
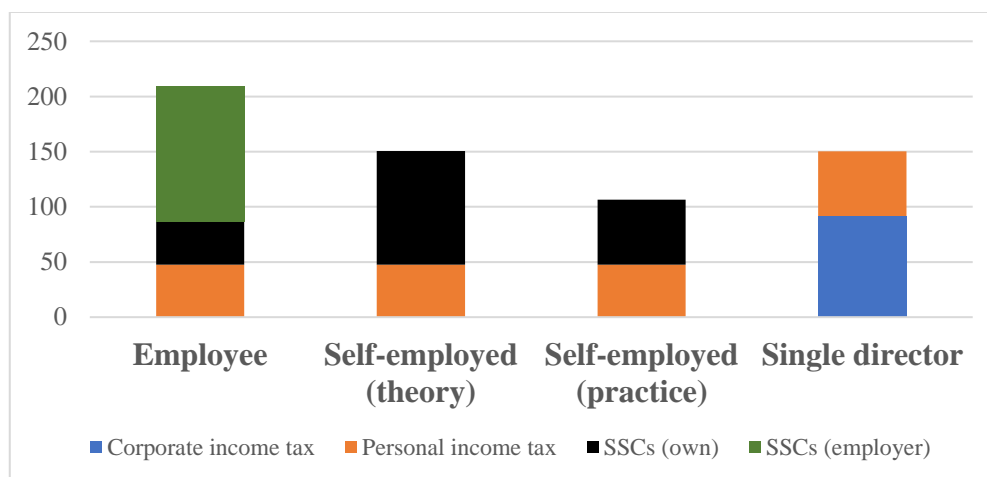
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Fig. 2. Tax due on CZK 482,400 of income (employee: supergross wage) in 2018 (own elaboration)

Figure 2 shows that the overall tax burden on self-employed in Czech practice is essentially lower than in Great Britain. Even in the case where self-employed have chosen the assessment base for the calculation of their social security contributions at an amount of 50% of their profit ("theory"), their overall tax burden would still be relatively lower than in Great Britain. It is also clear that the differences in the tax treatment cannot motivate Czech self-employed towards the incorporation of their work activities. At the same time, the tax treatment of a single director is relatively advantageous from an international point of view. The rate of corporate income tax in our country (19%) is "commensurate" – it is admittedly slightly below average on an international scale, but it is typical for smaller OECD countries. In the last decade, the corporation tax rate in Great Britain has fallen significantly from 30% to 19% (from the 2017-18 fiscal year).

The taxation of dividends in Great Britain is structured in a similar way to the general taxation of personal income. The basic tax rate on personal income is 20%, while the next two rates are 40% and 45%. The basic tax rate on dividends is 7.5%, while the next two rates are 32.5% and 38.1%. Some influence of neoliberalism, which rejects the parallel taxation of dividends and corporate earnings, is clear here. By contrast, capital income in Sweden is taxed at 30%. The Czech tax rate on dividends is 15%, which is identical to the flat 15% tax rate on personal income; which is why we have been able to designate the taxation of dividends as the income taxation in Fig. 2. According to international comparisons of OECD countries, Czech dividend taxation is distinctly below average. Typical dividend taxation rates in western countries are 25% and more. It is clear from this information that the problem of the incorporation of self-employed in Great Britain is based on the low basic tax rate on dividends which is not applied in the case of typical entrepreneurs. According to international comparisons, the taxation of dividends in Great Britain is very high – these comparisons use the upper marginal rate of this taxation.

It can be inferred from the previously stated data and from other comparisons that Czechia (and other post-Communist countries) have low levels of capital income taxation which is "compensated for" by high employer social security contributions. The low taxation of capital and wage income is given by the neoliberal policy which has been applied in the majority of post-Communist countries in the previous decades. High employer social security contributions do not actually mean anything in and of themselves. This issue cannot be separated from the characteristics of the social security, for example in Czechia.

The key to the objectification of the rates for social security contributions of employees and self-employed is the welfare regime or the system used both here and abroad. In this regard, there are essential differences between the individual welfare regimes, as far as both employees and self-employed are concerned. The modern liberal model can do without social security contributions, as universal monetary benefits and services are financed from general taxes. We can include here, for

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example, Great Britain with its universal (flat) state pension and with universal healthcare provided by the National Health Service. British national insurance contributions and the local National Insurance Fund needlessly complicate this model, which has also been confirmed by the aforementioned recommendation of the Mirrlees Tax Review; the error in the system dates directly from Beveridge (and his Committee), who did not want to provide these benefits "free of charge". The existing Czech social security system has the same ideological base to a significant extent: the core (about two thirds) of the state pension is independent of earnings and public healthcare is financed via seven public-law health insurance companies which are just as pointless as the British National Insurance Fund. Here too, the payment of pension insurance and health care insurance contributions is compulsory, and it assumes the nature of a proportional income tax to a significant extent. From this point of view, the insurance contributions paid by employees (and their employers) and self-employed should be identical, just as it is in Great Britain or in Sweden, but under the proviso that employees and self-employed receive social security at same extent.

By contrast, the conservative (Christian-democratic) welfare regime is based on the fact that the interests and needs of individual social groups are different. State employees (civil service) are the preferred social group; it does not make sense to collect social security contributions from them. Social insurance is used, however, in the case of employees in the private sector, whereby the model envisages a situation where the employee pays half the insurance contribution and this contribution is a tax-deductible item regarding the employee personal income tax. Self-employed constitute a special social group. To be more precise, there is a wide range of groups of self-employed in Germany, for example. There is a significant difference, for example, between blue-collar and freelance self-employed as far as the social security systems and their financing are concerned. A classic variant for freelance professions involves voluntary social security. Another typical phenomenon is the (independent) existence of a trade tax alongside taxes on corporate income.

The social-democratic welfare regime places an emphasis on the existence of universal social insurance, universal benefits (for example child benefits), public social services and supplementary benefits in the form of housing allowances or so-called guarantee pensions. The social security contributions in this model are paid by employers and self-employed. The payment of contributions by employees would be an unnecessary complication in this model. Social security contributions in Sweden are paid from the total remuneration, there is no earnings ceiling – and about 60% of these contributions could be regarded as taxes and the remaining 40% as compulsory social security premiums. (Skatteverket, 2016)

The neoliberal welfare regime does not include any employer contributions to social security and employee contributions are usually also not part of this model, as employees pay these contributions into private funds (private pension companies, private health insurance companies and the like) from their net income.

The Czech social security system which falls closest to the social-democratic welfare regime – at least from the points of view which interest us here. We could also characterise the Czech system as a social-liberal system. As such, we should tax the incomes of employees and self-employed identically – calculated from the same base, of course. If we intend to tax self-employed profit), then we cannot fail to take into account the social security contributions paid by employers (SSC) on behalf of employees with the R_{SSC} rate. The assessment base for the equivalent contributions of self-employed should be equivalent to the gross wage (GW), i.e. the self-employed income (SEI) after the deduction of these self-employed contributions. The following relationships apply mathematically:

$$SEI - SSC = GW \qquad\qquad (1)$$

$$SSC = GW * R_{SSC} \qquad\qquad (2)$$

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We can calculate the gross wage from those two equations:

$$GW = SEI / (1 + R_{SSC}) \tag{3}$$

In Slovakia, the assessment base for the self-employed social security contributions is calculated by dividing the self-employed income with a coefficient of 1.486, whereby the social security contribution rate paid by employers amounts to 35.2% and employees pay a further 13.4% meaning that the entire rate is therefore 48.6%. The contribution rate for self-employed is 47.15%; this lower rate in comparison with that paid in case of employees is given by the differences in social security. The self-employed insurance contributions are considered to be expenses when calculating their income tax base; they are tax deductible. The Slovak solution can be considered to be a concept which also falls under the social-liberal regime.

The concept of pension insurance constitutes an essential difference between the Czech and Slovak social security systems which should be projected into the Czech social security contributions: whereas the Slovak pensions are dominantly earnings-related, the opposite is true in Czechia: the flat-rate pension is predominant "courtesy of" the existence of the so-called basic pension assessment and the very low first bend point when calculating the so-called percentage pension assessment (44% NAE) and the very low coefficient for crediting earnings over and above this bend point (26%). The rationalisation of the pension calculation (without any changes in the redistribution of incomes) requires the reduction of employee social security contributions by 11 percentage points and as such enables a simultaneous, generally necessary increase in employee income tax, specifically by the same 11 percentage points (we do not wish to redistribute incomes during this reform). This will also lead to the necessary rationalisation of income tax, as the tax rate will be altered to 31.1% of the gross wage and the solidary tax surcharge will be done away with. (Vostatek, 2018)

The rationalisation of personal income tax is also necessary regardless of the taxation of the earnings of self-employed, as this will bring us more or less to the level of the basic personal income tax rate in western countries. This degree of taxation is also commensurate as far as the taxation of capital incomes is concerned (however, the recipients of such incomes will of course be against it). We may recommend the same tax reform to the Slovak government as well.

The rationalisation of personal income tax will enable the application of the Slovak concept of the assessment base for the social security contributions of self-employed in its "narrower", albeit more logical, form unimpeded by the existence of employee social security contributions and therefore also fully compliant with mathematical formulae (1)-(3). The existing rate for employer contributions to social security in our country is SSC = 34%. In other words, the assessment base for the self-employed social security contributions should be arrived at by dividing the self-employed earnings by 1.34. And these contributions should be deductible from the self-employed income tax base.

The overall rate of self-employed social security contributions should conform to the social security concept or to the entire system of remuneration. The option of choosing the amount of the pension or any other social security should not be open to self-employed in a social-liberal system, as social security is meant to be universal for all its gainfully employed participants. This applies to both pension and sickness insurance. However, inequalities do exist between self-employed and employees outside the existing Czech social insurance system: employees are entitled to direct benefits from their employers during any incapacity to work due to illness or injury for the period of the first two weeks. In Slovakia, this period (10 days) is covered for self-employed by legal sickness insurance and the self-employed therefore pay higher insurance contributions. On the other hand, self-employed there do not pay social accident insurance contributions (in Czechia, we have the compulsory liability insurance of employers for any damages caused in work accidents and as a result of occupational diseases) or contributions for so-called guarantee insurance (to guarantee the payment of wages, if the employer becomes bankrupt). If we were to assume under Czech conditions that self-

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employed would not participate in unemployment insurance or the parallels to social accident insurance and on the other hand they would be subject to sickness insurance from the first week, then the overall rate of the social security contributions for self-employed would probably be practically identical to the employer contributions. We make this assumption in the following section.

A further significant factor when comparing incomes (and their taxation) is the entitlement of employees to paid leave and to other employee benefits. These benefits can be projected into the self-employed incomes by means of the fiction of the existence of an additional social insurance branch. It is possible to imagine that paid leave and other employee perks constitute a benefit from the social security insurance which is financed by means of the insurance contributions paid by the employers. Let us assume, for example, that the expenses for this branch of social insurance in this country are in the extent of two months earnings per year and that the necessary insurance paid by the employer therefore amounts to 16.7% of the gross wage. We can project this fiction into the fictitious self-employed gross wage in order to reach a base, from which the social security contribution is assessed. The amount of the self-employed income derived above for these purposes would therefore no longer be divided by a coefficient of 1.34, but of $1.34 + 0.167 = 1.507$. The inverted value of this coefficient amounts to 66.4%. We can therefore define the assessment base for a self-employed individual's social security contribution as 66.4% of the profit. We have therefore reached almost the same recommendation as the OECD (2000).
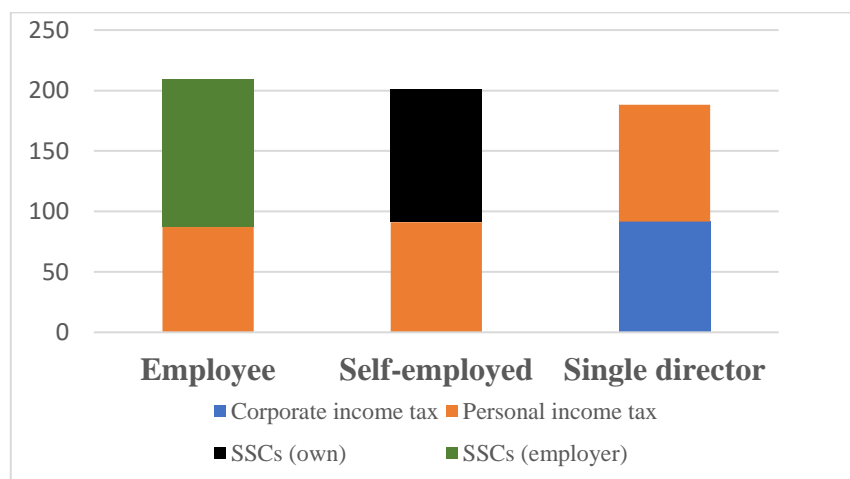

Fig. 3. Adequate tax due on CZK 482,400 of income (employee: supergross wage), reform proposal (own elaboration)

Fig. 3 illustrates the results of these proposed reforms; the initial data on earnings is the same here as in Fig. 2 and here too we have presupposed national average earnings (NAE) at the amount which is valid for the general assessment base for 2018. After this reform, an employee would pay income tax at the amount of the sum of the existing income tax and the existing employee social security contributions. Employer social security contributions would remain unchanged. The social security contributions of self-employed would be slightly lower than the contributions paid for employees as a consequence of which the new income tax for self-employed would be slightly higher than in the case of employees. The overall tax burden on self-employed would therefore be commensurately lower than in the case of employees. The new total income taxation of a single director was calculated at a lower level than the self-employed income taxation, but these taxpayers would, of course, have to pay significantly higher tax on dividends or personal incomes (these calculations presuppose that the entire profit of the enterprise will be used for dividends). The resulting relationships between the three workforce groups in Fig. 3 are therefore even more rational at first glance than the relationships in Great Britain contained in Fig. 1. The reform concept can be considered to be applicable, even despite its politically demanding nature. The relationship with regard to the overall tax burden of self-employed and employees which has been illustrated in Fig. 3 can be considered to be commensurate

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under the existing Czech redistribution conditions, provided the self-employed use the social security system (in particular social pension and sickness insurance benefits) at an extent which is equivalent to that of employees. This corresponds to the social-liberal welfare regime.

5 Conclusion

The disparity in the income taxation (including social security contributions) is significantly higher in Czechia than in Great Britain and the OECD recommendation to eliminate the tax bias in favour of the self-employed is fully justified. A systemic approach to these matters also requires the corresponding selection of a welfare regime. Czechia is rather close to the social-liberal model in this regard. It made sense to unilaterally support the development of small private businesses after the Velvet Revolution, but there are relatively more self-employed under current Czech conditions than in western countries and the excessive fiscal support for self-employed has deformed the labour market and palpably reduced fiscal receipts.

Part of the necessary rationalisation of Czech pension system includes a reduction in the rate of the pension insurance contributions by 11 percentage points and a transition to the financing of the universal component of today's pensions from general taxes, which can be easily achieved by increasing the personal income tax rate by the given 11 percentage points. This will not only simplify the fiscal system, but also essentially bring our income tax rates into line with those of western countries. In the new system, the social security contributions will only be paid by employers and self-employed, which will bring us more in line with the rational social-liberal model. The introduction of compulsory sickness and pension insurance for self-employed with benefits equivalent to those received by employees will also lead us in the same direction.

The systemic approach requires the assessment base for the social security contributions of self-employed to not only be derived from the rate of employee social security contributions, but also from the scope of the social security which self-employed receive, as well as the financial dimension of the expenses outlaid on paid leave for employees and other employee benefits. Self-employed social security contributions should be deductible from their income tax base. This will make it possible to achieve the fair tax treatment of employees, self-employed and single directors.

6 Acknowledgement

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LOBBYING – REGULATION AND BUREAUCRACY

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Abstract
The paper deals with lobbying, which it defines as a democratic means of promoting interests within society. Using a simple graphic model, it defines the basic ties in lobbying, which, in terms of economic theory, is viewed as a series of ties of a predominantly market nature, where the market concerned is the information market. The role of the Government, which is generally regarded as the central decision-making authority, mainly consists in creating a favourable institutional environment, which does not interfere with spontaneous market relationships However, there are certain situations that the Government could, or should regulate, and this paper discusses such situations using three hypothetical scenarios – a lobbying-free society, a society where lobbying exists, but is not transparent, and a society where lobbing is transparent. The conclusion discusses various regulation options.

1   Introduction

The paper loosely builds upon three articles, either published in the past, or awaiting publication, namely "Lobbying in the European Union and the Czech Republic" (Laboutková and Žák, 2010), in which we attempted to define lobbying in general terms (Laboutková and Žák, 2016) which presented a basic graphic model of the fundamental ties between entities directly involved in the lobbying process and a view of the scenarios that follow from the model and may play out in real life, namely a) lobbying-free society; b) society where lobbying exists, but is not transparent, and c) society where transparent lobbying exists; and on the text which seeks to establish the extent to which economic theory is capable of explaining away the ties specified in previous papers.

In an attempt to define lobbying, we established that "most definitions characterised lobbying as interfering with legislative and decision-making processes, or promoting specific interests different from those that may be seen as society-wide, and there was no single definition acceptable to all". The following text concludes that, "this is also due to the constant development and shifts in the understanding of politics, public affairs and interests", and "if we summarise the above definition, we can say that lobbying primarily aims at promoting interests, it is an indispensable source of information, while the greatest challenge involves making lobbying distinct from corruption". Lobbying and its definition are therefore more likely to pertain to the realm of political science, which discusses the effects these processes have on the democratisation of society.

The political process thus becomes a bargaining game between private and public officials and has a non-negligible impact on democracy. Carmen Stefan considers the effect lobbying has on democracy on three levels. First, lobbying serves as an information channel. This is due to the increasing complexity of decision-making processes and the related administration, including the requirement for greater (more democratic) awareness raising among EU citizens. Second, lobbying is a tool for removing the democratic deficit resulting from the multilevel bureaucratic process, and third, there are certain positive impacts of lobbying on the decision-making process. Decision making is more democratic, as it allows more entities to become involved in the final decisions.

From the economic point of view, however, the dominant perspective is that of the commodity being exchanged among stakeholders, i.e., information. Information as goods in the market. In the

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papers referred to above (Žák, 2016), we arrived at the following characteristic features of lobbying. Lobbying:

- is primarily focused on promoting interests
- is an indispensable source of information
- is characteristic of the activity of interest groups
- ties between political science and economics demonstrate themselves in the rational choice theory
- deals with voting procedures
- applies the capacities of the game theory in characterising and estimating the potential strategies of lobbying groups
- outlines the agency problem, impacts of the political-economic cycle and transaction costs
- and opens the issue of informational asymmetry in political markets.

Lobbying is viewed as a democratic means of promoting the interests of non-decision makers, to whom lobbying is a welcome and indispensable part of the legislative process[1], in particular as a source of decision-making information. In explaining the lobbying process, economic theory can operate both with traditional market schemes (the information market) as well as some non-mainstream processes, particularly the public choice theory and the new institutional economy. During negotiations between entities, these concern the underlying functional processes of the political market, to which some conclusions derived from the game theory may be applied. Whether there are any ties with the political/economic cycle (and if so, what they are) remains largely an open question, just like the issues related to the long and short terms, although the latter has been dealt with, in part, for example, by the application of the "prisoner's dilemma".

2   Mutual relationships during the lobbying process

The starting point for our consideration of ties between lobbying subjects, namely the Government[2] as the decision-making authority, and the general public (citizens, civil society) and the business sector, is the following graphic model, see Figure 1.
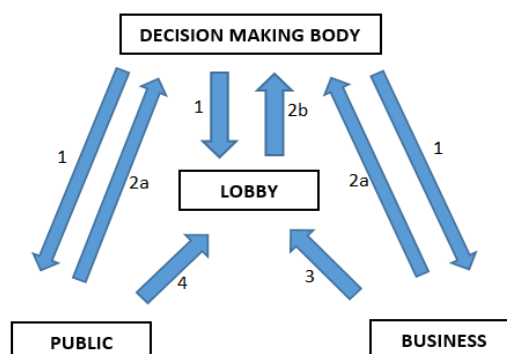

Fig 1. Relationships model (exchanges, provision or receipt of information) (Source: Laboutková and Žák, 2017)

As stated above, the State is a bureaucratic institution that makes the rules (1). The State adopts decisions using the information it obtains from its own sources (knowledge of officials and politicians, State institutions supplying information) or from the public non-government sector (2a)

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[1]"One lobbyist is a problem, a thousand lobbyists are a blessing for democracy." – words of Karl Isakson, Chairman of the European Affairs Consultaciens' Association at the "Transparency and Statutory Regulation of Lobbying" seminar, Chamber of Deputies, Prague,13 March 2018.
[2] For the sake of simplicity, we use the term "Government" for all kinds of central decision-making authorities at all levels.

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and the private sector (2a). Information obtained from interactions between the lobbying community and the State (2b) represents a situation where companies hire professional lobbyists or set up professional lobbying groups (3), while civil society spontaneously creates (4) interest groups developing lobbying efforts to influence the State's decisions, i.e., the way rules are made.

In an attempt to describe the behaviour of specific economic entities during the lobbying process, we may rely on the description of the primarily entities in the economy, namely the State, businesses and citizens, as shown in the following Figure 2.
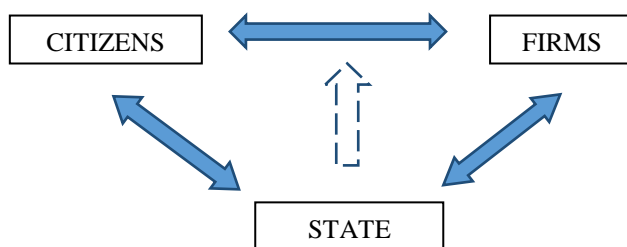

Fig 2. Graphic representation of ties in the economy (basic model) (Source: Gregor, 2005, our own editing)

The ties indicated in the chart imply the following relationships. The ties between businesses and citizens involve a plain model of purely economic markets where market relationships exist. Citizens operate as consumers, businesses as producers, and citizens as employees and businesses as employers. Adding the political relationship dimension, which may be characterised as (narrowed down to?) the economic policy and which we define as Government relationships, gets us to the area of non-market driven decision-making, the domain of the functioning of political markets.

Table 1: Conclusions from the MODEL

tie	Direction	Description	Nature of the relationships
1	The State – business	Demand for information	The information market is a standard market. The role of the State as a factor in the spontaneous processes on the demand side actually involves ensuring the quality of the bureaucratic apparatus.
2 a	Lobby-free society – the State	Supply of information from the general public and businesses	The information market is a standard market. The role of the State as a factor in the spontaneous processes on the demand side actually involves ensuring the quality of the bureaucratic apparatus.
2 b	Lobby – the State	Supply of information from lobbying groups	While rule formation is necessary, regulation remains questionable.
3	Businesses – lobbying	information of intermediaries (the lobbying community) from businesses	This is a standard market relationship where information is a commodity, and the price is determined on the supply/demand basis.
4	The public – lobbying	information of intermediaries (the lobbying community) from the public	This is a standard market relationship where information is a commodity and the price is determined on the supply/demand basis.

Source: Our own editing.

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Based on the Table 1 above, the following three hypothetical scenarios may be formulated:

1. Absence of lobbying efforts (relationships between the Government, the public and businesses are not institutionalised)

In this scenario, the Government makes it own independent decisions, relying on its own sources of information and/or the quality of its bureaucratic apparatus. The advantage here is the low cost; the disadvantage is the low quality of the decisions made due to a lack of information. The cost of obtaining additional information is high, as is the risk of the information asymmetry being taken advantage of in favour of the providers of such additional information. Time delays also have a significant role to play.

2. Lobbying exists – the relationships are partially institutionalised, but they are not transparent

The Government takes advantage of the intermediary functions of lobbying, the cost of information is lower, but the likelihood of the information asymmetries being misused is high, creating room for a corrupt environment evolving.

3. Lobbying exists – the relationships are institutionalised and transparent[3]

The Government puts in place rules that allow competition in the information market, each bargaining game entity has the same access to information, and the result should be an informed decision based on social consensus (the compensation rule may increase costs), which generally yields higher social and economic efficiency. As a rule, the costs incurred are necessary, yet the issue of the quality of the bureaucratic apparatus persists. The system raises the question whether regulation should be introduced and if so, what should be regulated. In general, it should apply that the better the institutional environment (the rules), the less regulation is required.

I attempted to assemble all of the scenarios described above, including their other characteristics, in Table 2. The below list shows that the fundamental problem of lobbying in a democratic society, where enforceable rules have been introduced, is not so much related to the promotion of specific interests, since those clash in the information market where individual groups can compete with one another (let us repeat Karl Isakson's quip: "One lobbyist is a problem, a thousand lobbyists is a blessing for democracy"), but rather to the ability of the actors involved to evaluate this information before they ultimately use it in their decision-making. Table 1 suggests that market conditions may be generated in all types of ties, except for 2b. The latter has been characterised as follows: "Rule formation is necessary, yet regulation remains questionable". In the following, we will therefore focus on these two issues and ask the following questions: what is the quality of bureaucracy and what purpose should potential regulation serve and what should it focus on.

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[3] Transparency is regarded as a concomitant feature of democracy; transparency denotes transparent and publicly accessible actions taken by the State.

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Table 2: Analysis of the described scenarios

	No Lobbying Basic Model	**Non-Transparent Lobbying**	**Transparent Lobbying**
Combating Lobbying	Does not exist	Unnecessary, inefficient	Quality of the institutional environment – the legislative framework and informal institutions
Combating the Risk of a Corruption Enviroment Evolving	Information supremacy makes it possible for one's own interests to be promoted	Verbal, random	Clearly defined rules address the problem
Transparency in Public Decision Making	Functioning information market	Missing, does not exist	Follows from the definition
Legitimisation of Lobbying	Not necessary	Not implemented	Determining rules for using market forces in the information market
Source of Information	Own, random, non-systematic	Non-transparent information market	Functioning information market
Formal Rules	Do not exist	Do not exist or are confusing	Underlie the system
Informal Rules	Follow from the level of institutional quality	Follow from the level of institutional quality	The system itself spontaneously generates a higher quality level of the institutions
Costs	Monopolisation of information – rent seeking	Monopolisation of information – rent seeking	Administrative costs
Information Asymmetry			Functioning information market
Actor Uncertainty	High, resulting from low awareness	Medium, resulting from the impossibility to verify information	Essentially amounting to zero – all information may be found
State Failing	The decisions are inefficient, no relative information is available	Rapid growth of the bureaucratic apparatus, the likelihood of corruption is high	Dangers of excessive bureaucracy
Social Responsibility	Spontaneous	No impetus for social responsibility	Yields an environment that favours social responsibility
Quality of Institutions	Depends on spontaneous development – historical	No attempt at improving the quality of institutions	Conscious steps to achieve changes in the institutional environment

Source: Laboutková and Žák (2016), own creation.

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3 The issue of bureaucracy and regulation

At a certain stage in the development of a society, bureaucratic management takes over, replacing, or adequately adding to, the role of the market, on the basis of social consensus. As there are market failures, there may also be bureaucratic failures, as a specific type of government failure. The risk of a bureaucratic failure is the effect of two fundamental causes: first, the absence of a market for managers in the public sector, and second, an "accountability failure" experienced by public authorities (Gregorová and Žák, 2008). The absence of a market for managers is due to a monopoly in the information domain, typically translating itself into the "tenure" requirement. This not only leads to the inability of the public sector to respond to new impetus and to stale thinking and management, but also creates room for corruption. Accountability failure is the result of differences in administration between the private and public sectors: while in the private sector accountability is taken care of by the market, in the public sector, no such solution is available. Suppressing market solutions, altruism and morality enter the scene, with the ensuing ideal of an official only following the interests of the society. If altruism and morality are absent or hard to enforce, rent seeking and struggling for the office's budget occur, creating room for corruption. Simply put, the solution involves cultivating the institutional environment, providing education and accepting social responsibility.

Regulation may be defined as control, direction and management of economic activities in the private sector by the State in the interest of economic efficiency and equity. Therefore, it is an activity that pertains to the State, which, within the general legislative process, prevents certain undesired activities from being promoted and authorises or condones another. From the historical perspective, regulatory measures may be divided into traditional regulation, which focuses on prices and wages, sectoral and business regulation and public goods regulation, and regulation aimed at promoting dissemination of information with the objective to remove information asymmetries – a new regulation tier. When discussing what and how or whether to regulate activity in the domain of promoting interests at all, we necessarily need to ask the following questions relating to the very purpose of potential regulations: Is regulation capable of preventing corruption and improving the quality of decision-making, and is it compatible with society democratisation, or does it make no sense at all? Let us look at the issue from the perspective of the regulatory options available – see Table 3.

Table 3. Lobbying regulation options

Degree of intensity	Low intensity	Medium intensity	High intensity
Regulation of registration rules	Basic	More focused	Extremely thorough
Definition of lobbying objectives	For members of the legislature and their staff only	dtto plus the executive branch and their staff, agency managers, public administration and officials	dtto
Targeting of expenses	Without clear rules	Weak (selective) regulation of individual Expenses	Strict regulation
Electronic oversight	Weak oversight	Massive oversight without the "paperwork"	dtto
Public oversight	List of lobbyists, incomplete and subject to random additions	dtto Detailed and subject to additions	dtto + detailed view of the expenses
Enforceability	Vague	Low	Systemic – such rules are put in place that no regulation is required

Source: Our own editing.

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4   Conclusion

There are following conclusions according to the previous research: In a democratic society, lobbying is a legitimate tool for promoting the interests of businesses, citizens and interest groups. The nature of the mutual relationships in the lobbying process is based largely on information sharing where the information market plays a dominant role. To achieve the highest degree of transparency in the information market, the Government, as the central decision-making authority, must put in place precise rules governing the actions of all stakeholders in decision-making processes, including the enforceability of such rules.

Problems related to market failures primarily exist due to informational asymmetry. In addition to setting the rules as referred to above, the solution rests in first improving the bureaucratic structures and only then introducing regulatory measures. Regulation should provide an answer to the question of whether, or not, regulatory measures could be replaced by rules or with spontaneous adaptation.

5   Acknowledgements

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THE INFLUENCE OF CHANGES IN THE SICKNESS INSURANCE SYSTEM ON EMPLOYMENT IN THE MORAVIAN REGIONS OF THE CZECH REPUBLIC

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Abstract
The aim of this paper is to give an idea of sickness insurance, especially of the influence of legal regulation changes in the system of this insurance on employees focusing on the Moravian regions of the Czech Republic. The impact of changes in sickness insurance is presented by selected indicators of the temporary incapacity for work using regression analysis to estimate the development of individual indicators in the following years based on knowledge of the development of indicators in the years 2000-2017. The research results is captured using trend line which will display the possible development based on the data in the Moravian regions of the Czech Republic in the following years. Regression equation presents an approximation of the entered values where the coefficients are determined by the method of least squares, so that the sum of squared deviations of the original values from obtained model would be minimum. The R^2 index expresses the degree of reliability of the calculated estimate of the development. It was found that legislative changes in the sickness insurance influenced significantly the development of all indicators of the temporary incapacity for work in each regions.

Keywords
Social security system, Sickness insurance, Sickness benefits, Employee, Temporary incapacity for work.

JEL classification
H75, K32

1   Introduction

Demographic aging causes not only an economic slowdown, but also an increase of health care costs and growing problems in the field of social security. And just social benefits represent the most important component of the state budget mandatory expenditures.

Besides other things the Act no. 187/2006 Coll., on Sickness Insurance was approved as a part of the reform of public finances. This Act became effective 1 January 2009 and provides a comprehensive adjustment of the sickness insurance for all persons who are participated in this insurance. In the course of the year 2008 there were made adjustments in sickness insurance three times (effective from 1 January, 30 June and 1 September). These bore on changes of the payment of sickness benefits for the first three days of illness and related assessment base for determining of the amount of the daily sickness benefits. Other changes include a reduction of social insurance and voluntary sickness insurance burden. The aim of these changes was to increase the motivation of employees and employers to reduce an excessive incapacity for work.

The aim of this paper is to give an idea of sickness insurance, especially the impact of legal regulation changes in the system of this insurance on employees, who represent the largest share of socially insured persons, focusing on the Moravian-Silesian, Olomouc, Zlín and the South-Moravian regions.

2   Sickness insurance and sickness benefits

Sickness insurance is a part of social security and its task is to insure people participating in this system by the insurance benefits at law intended social events in order to reduce or completely eliminate the effects of these events (Sirovátka, 1997).

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As Krebs (2007) claims, there has been a rapid increase in expenditure on sickness insurance and social system has reached a deficit, as a result of the amendment to Act on Sickness Insurance effective since 1 October 1999, which significantly increased the level of insurance.
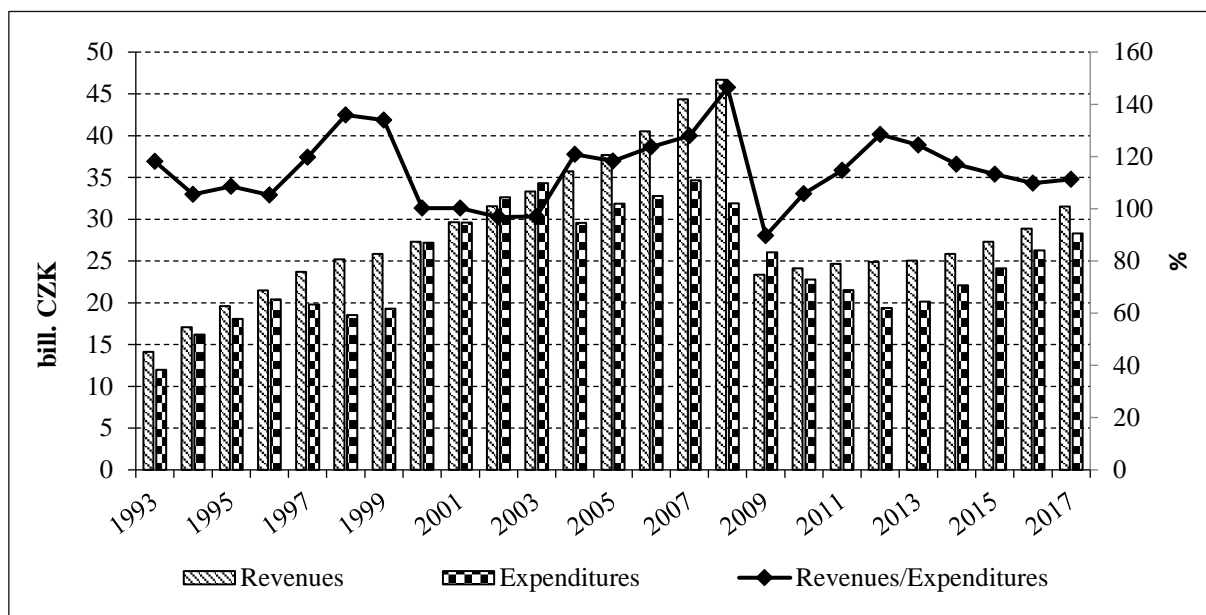

Fig. 1. The development of sickness insurance´s revenues and expenditures in billions of CZK
(Source: MLSA (2017), CSSA (2018) + author´s calculation)

As we can see in the figure above, there has been a decrease in expenditures on sickness benefits since 2004, which was caused partly by changes in the structure of sickness benefits and partly by reducing rates. In 2008, there were further changes in sickness benefits within the stabilization of public finances, which included new four percentage rates depending on the duration of incapacity for work, and sickness benefits have been provided since the 4th day of the incapacity for work. Based on the findings of the Constitutional Court, sickness benefits were provided again amounting to 60 % for the first three days since 30 June 2008 and then amounting to 25 % since 1 September of this year. The result was a significant increase in the ratio of sickness insurance income and expenditure on sickness benefits. In 2009 there was another reduction in insurance rates (decrease of 2.1 pp), which caused a significant decline in insurance income. The graph shows that the sickness insurance system showed a deficit in that year, but the situation in the following year turned and this trend still continues. The reasons for decrease of expenditures are the payment of refund of wages by employers and also decrease of number of the temporary incapacity for work (TIW).

Sickness insurance as part of social insurance is obligatory for a majority of Czech citizens - i.e., they are required by law to pay this insurance (Tröster, 2005). Compulsory participants of the sickness insurance are employees, who receive or could receive wages or salaries from employers, regardless of the type of employment relationship, as opposed to self-employed persons whose participation in sickness insurance is voluntary Gregorová and Galvas, 2000).

Participation in sickness insurance commences on the date of entry into employment and expires on the date of termination of employment (Ženíškova a Přib, 2011). The law laid down the conditions for participation in the sickness insurance system together with the subsequent claim for payment of benefits, and these include:
- the performance of gainful employment on the territory of the Czech Republic[1],

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[1] If the employee is working temporarily outside the Czech Republic, it has no effect on his/her insurance.

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- the minimum level of agreed income, i.e. the applicable income that has been determined to the amount CZK 2,500 since 2012[2],
- an assessable income in an amount higher than CZK 10,000 for employees under contracts for performed work (CPW) accounted (Novotný, 2013).

The amount of the insurance is calculated as a percentage of the assessment base for the relevant period. As for employees, the insurance as a percentage of social security and state employment policy is partly paid by the employee himself and partly by the employer from the gross wage. With regard to providing of wage compensation in the first period of incapacity for work employers were reduced insurance rate by 1 percentage point and in 2009 and 2010 they were also refunded a half of the salary compensation in the form of a deduction from the insurance. Table 1 shows the sickness insurance rates of social security as per payers in 2018.

Table 1. Sickness insurance rates

Payer	Rate
Employee	0.0 %
Employer	2.3 %
Self-employed	2.3 %

Source: Act no. 589/1992 Coll., the social security insurance and contribution to the state employment policy, as amended + author´s calculation

The sickness insurance system of benefits comprises four benefits, namely sickness benefit, attendance allowance, maternity benefit, and pregnancy and maternity compensation benefit. Since 1993, when the above-mentioned Act on social security insurance and contribution to the state employment policy came into force, there have been many changes in the calculation of sickness benefits. The amount of these benefits started to be counted from the gross income of employees attained in the previous calendar quarter, and at the same time the rates for the calculation of benefits were reduced. In 1999, the reduction limits were introduced, of which sickness benefits are subsequently calculated.

Since 1 January 2009 a new Act no. 187/2006 Coll. of Sickness insurance has become effective and brought a radical transformation in sickness insurance and sickness benefits in particular. Among the most significant changes related to the new legal regulation are in particular:

- payment of refund of wages or salary during the first 14 days,
- payment of sickness benefits only from the 15th calendar day of incapacity for work,
- sickness insurance for all insured persons (other than members of the armed forces and safety brigades, persons in custody and convicted persons) is already performed only by social security administrations district offices.

Since 1 January 2011, changes occurred in the payment of sickness benefits by amendment to Act, which were provided from the 22nd day of incapacity for work. This situation was in force to 31 December 2013 and then it returned to its original duration, i.e. those sickness benefits are again provided from the 15th day until the end of TIW, but not more than 380 calendar days from the beginning of TIW.

Another significant change occurred 1 January 2012, ever since the amendment of the Labour Code introduced a participation in sickness insurance for employees who practise their jobs under CPW at the agreed income higher than CZK 10,000 (Hulec, 2012). Since that time these employees have also been entitled to sickness benefits, if certain conditions are met. The following table shows

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[2] Since the new law until the end of 2011, the limit of the applicable income was determined to the amount of CZK 2,000.

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the changes in the provision of sickness benefits, in their amount and the reduction limits from 2009 to the present.

Table 2. Changes in sickness benefits in the years 2009-2018

Year	Payment of benefits	Amount of benefits		Reduction limits		
		period	*daily rate*	*first*	*second*	*third*
2009	from the 15th day	from 15th to 30th day	60 %	786 CZK	1 178 CZK	2 356 CZK
		from 31st to 60th day	66 %			
		from the 61st day	72 %			
2010	from the 15th day	from the 15th day	60 %	791 CZK	1 186 CZK	2 371 CZK
2011	from the 22nd day	from the 22nd day	60 %	825 CZK	1 237 CZK	2 474 CZK
2012	from the 22nd day	from the 22nd day	60 %	838 CZK	1 257 CZK	2 514 CZK
2013	from the 22nd day	from the 22nd day	60 %	863 CZK	1 295 CZK	2 589 CZK
2014	from the 15th day	from the 15th day	60 %	865 CZK	1 298 CZK	2 595 CZK
2015	from the 15th day	from the 15th day	60 %	888 CZK	1 331 CZK	2 662 CZK
2016	from the 15th day	from the 15th day	60 %	901 CZK	1 351 CZK	2 701 CZK
2017	from the 15th day	from the 15th day	60 %	942 CZK	1 412 CZK	2 824 CZK
2018	from the 15th day	from 15th to 30th day	60 %	1 000 CZK	1 499 CZK	2 998 CZK
		from 31st to 60th day	66 %			
		from the 61st day	72 %			

Source: MLSA (2017) + author´s calculation

The reason for the above-described changes in sickness insurance was too high income solidarity, insufficient control mechanisms and, unfortunately, widespread abuse of the system. Although the state of health of the population demonstrably improved in the Czech Republic, there was not any reduction of incapacity for work of employees. The main indicators of the development of temporary incapacity for work include:

- new notified cases of TIW per 100 sickness-insured persons (SIP),
- average duration of one case of TIW (days),
- average percentage of TIW[3].

Changes in payment of sickness benefits, including the fact that the benefits were paid from the 22nd day of temporary incapacity for work (and also their lower percentage level), had a significant effect on the insured person's decision about the origin of their incapacity for work. As it is evident in the following table, there was a decrease in the number of new cases of temporary incapacity for work in the last decade, the significant drop in the number of new cases of TIW occurred in 2004 due to the aforementioned change in the construction of sickness benefits and cut rates. Further significant decrease occurred in 2009, when the new sickness insurance legislation came into force. The decline did not stop until 2013, when the values of this indicator began to slowly pick up an increasing tendency. Table 3 shows quite the opposite development of the relative index of the average duration

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[3] The ratio of the number of calendar days of incapacity for work due to disease or injury to the average number of the sickness-insured employees, multiplied by the number of calendar days in a year.

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of incapacity for work, which is also a more appropriate tool for comparing the intensity of incapacity of work. In the period 2007-2017, the average duration of 1 case of temporary incapacity for work increased from 34.6 days to 42.6 days, i.e. about 8 days, with the highest value reached in 2012 (46.1 days).

Table 3. Development of the main indicators of TIW in the Czech Republic in 2000-2017

Year	New notified cases of TIW per 100 SIP	Average duration of TIW (days)	Average percentage of TIW
2000	84.4	28.0	6.5
2001	86.2	28.6	6.7
2002	80.4	30.8	6.8
2003	81.7	30.5	6.8
2004	61.6	34.8	5.9
2005	68.2	32.8	6.1
2006	60.2	35.3	5.8
2007	59.3	34.6	5.6
2008	48.6	39.1	5.2
2009	33.9	45.1	4.2
2010	30.7	44.7	3.8
2011	30.1	44.1	3.6
2012	27.4	46.1	3.5
2013	30.0	44.0	3.6
2014	29.5	45.8	3.7
2015	34.7	42.7	4.1
2016	35.7	43.0	4.2
2017	36.6	42.6	4.3

Source: MLSA (2017) + author´s calculation

The maximum value of the average percentage of temporary incapacity for work (6.8 %) was reached in 2003. In the context of gradual legislative changes involving stricter drawing of sickness benefits, since 2004 the indicator's values have been gradually declining to almost half of its initial level (to 3.5 % in 2012). Starting in 2013 there was a change coming perhaps from the fact that the set of insured persons accustomed to stricter legislative conditions of sickness benefits drawing and value of the indicator began to rise again. In 2015 it exceeded 4% and reached 4.3% in 2017.

A significant research in the area of sickness insurance has been performed in the Scandinavian countries, especially in Sweden and Norway, where has been researched not only the historical development of the Swedish social insurance system and its reform (Edebalk, 2009), but also has been compared the processes of reforming sickness insurance in Norway and Sweden (Hagelung and Bryngelson, 2014). Ståhl et al. (2011) researched the effect of changes in the Swedish sickness insurance system on the return to work with a special focus on work ability assessments and Larsson (2006) is engaged in the interactions between unemployment and sickness insurance. A similar research was performed by Hall (2011). Hägglund (2013) also researched the impact of changes in the Swedish sickness insurance system on incapacity for work respectively on the employees' return to work.

The impact of reforms in the sickness insurance system was also researched in Germany by Ziebarth and Karlsson (2014), one of the areas of research was the matter how the increase of sickness benefits affects a duration of incapacity for work.

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3   Methodology

The influence of changes in sickness insurance will be presented by selected indicators of temporary incapacity for work using regression analysis to estimate the development of individual indicators (regresands) in the following years based on knowledge of the development of indicators in the years 2000-2017 (regressors).

The research results will be captured using trend line which will display the possible development based on the data in the various regions of the Czech Republic in the following years. Regression equation presents an approximation of the entered values where the coefficients are determined by the method of least squares, so that the sum of squared deviations of the original values from obtained model would be minimum. The R^2 index expresses the degree of reliability of the calculated estimate of the development.

4   Results

Development of the number of cases of incapacity for work in the Moravian regions (fig. 2) follows the national trend, including the decline in 2004 and further significant decline in 2009.
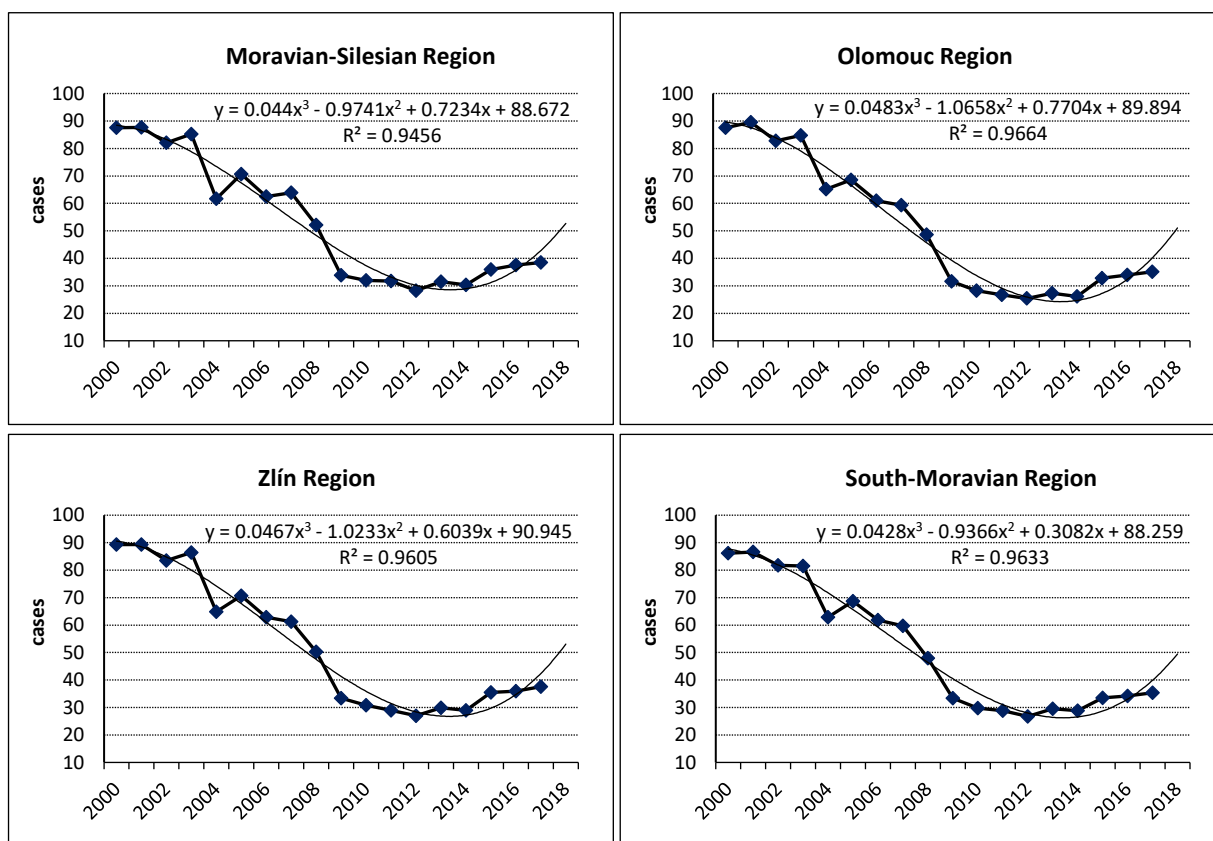

Fig. 2. Development of cases of incapacity for work (Source: CSA + author´s analysis)

The reduction continued until 2012, when the trend changed and the number of new notified cases of TIW per 100 SIP has begun to increase slightly again. If there are further changes in the legislation on sickness insurance, we can expect further growth of this indicator as confirmed by the regression equation with a high degree of reliability R^2 for each region.

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The development of the average duration of temporary incapacity for work (fig. 3) has a completely opposite course, but the comparison of Moravian regions with national results shows the same trend, that is the increase of TIW. In 2000, in Moravian regions was the period of incapacity for work due to sickness about a month; in the following years, the duration of the period was growing until it reached on average 52.3 days in 2014, which is an increase of 74 %.
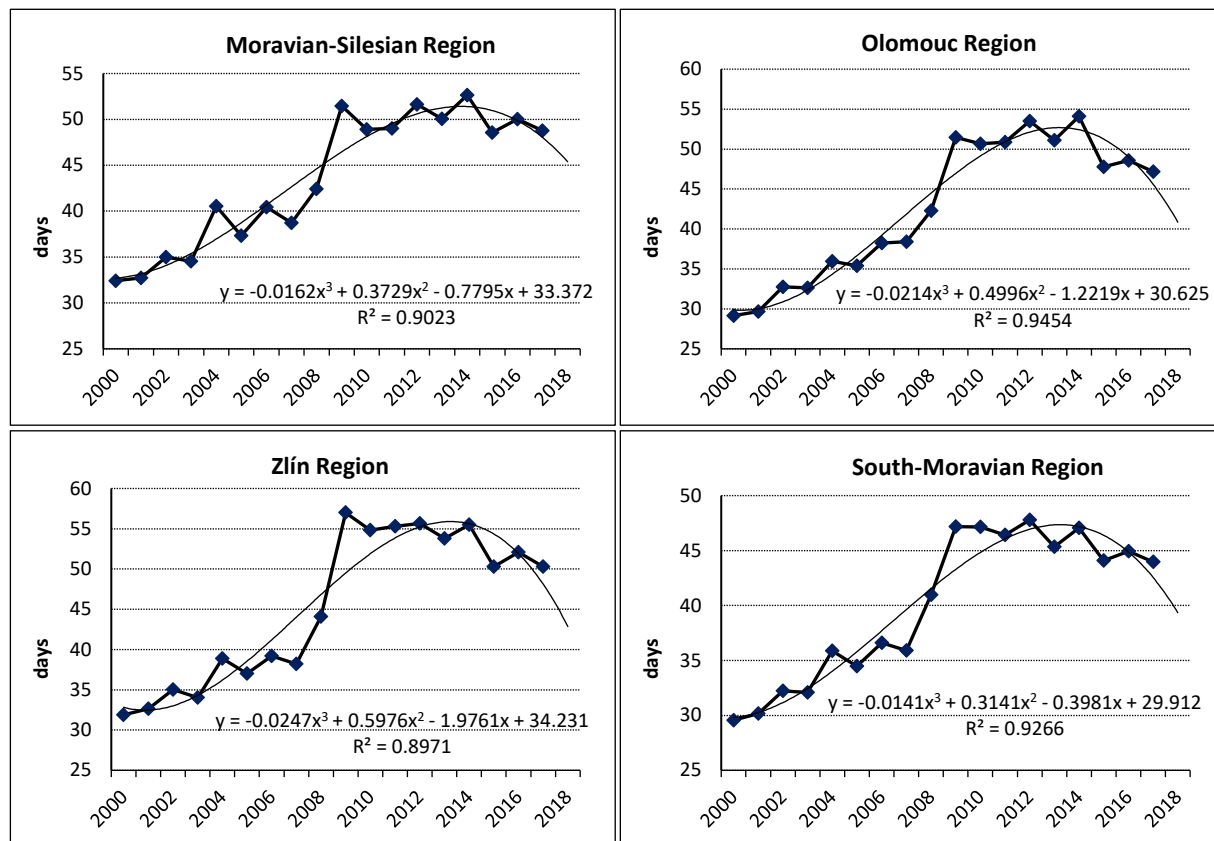

Fig. 3. Development of the duration of incapacity for work (Source: CSA + author´s analysis)

In the following years there was a slight decline to 47.7 days in 2015, but it can be expected (based on regression analysis, the reliability from 0.8971 to 0.9454), the duration of TIW will not be changed significantly in the following years. In 2017 the longest average duration of one case of temporary incapacity for work was recorded in the Zlín Region (50.3 days), the Moravian-Silesian Region (48.8 days) and the Olomouc Region (47.2 days).

As already mentioned, the value of the average percentage of incapacity for work was also decreasing in the researched period (fig. 4). This indicator takes into consideration both the total number of cases of incapacity for work (how often people start their incapacity for work) and an average duration of one case of TIW (how long they remain on incapacity for work). Since differences in the number of cases of TIW per 100 insured persons in the individual regions are not very significant, the average duration of TIW rather determines the ranking of regions by the level of the average percentage of incapacity for work. The highest average percentage of TIW were registered in Zlín and the Moravian-Silesian Regions.

Since 2005 the average percentage of TIW has been decreasing, most in Moravian regions, especially in the Moravian-Silesian and the South Moravian Regions. In practice it means that the number of incapacitated persons for work per 100 insured persons decreased on average 3.5 persons in the Moravian-Silesian Region, about 3.3 persons in the South Moravian and Olomouc Regions.
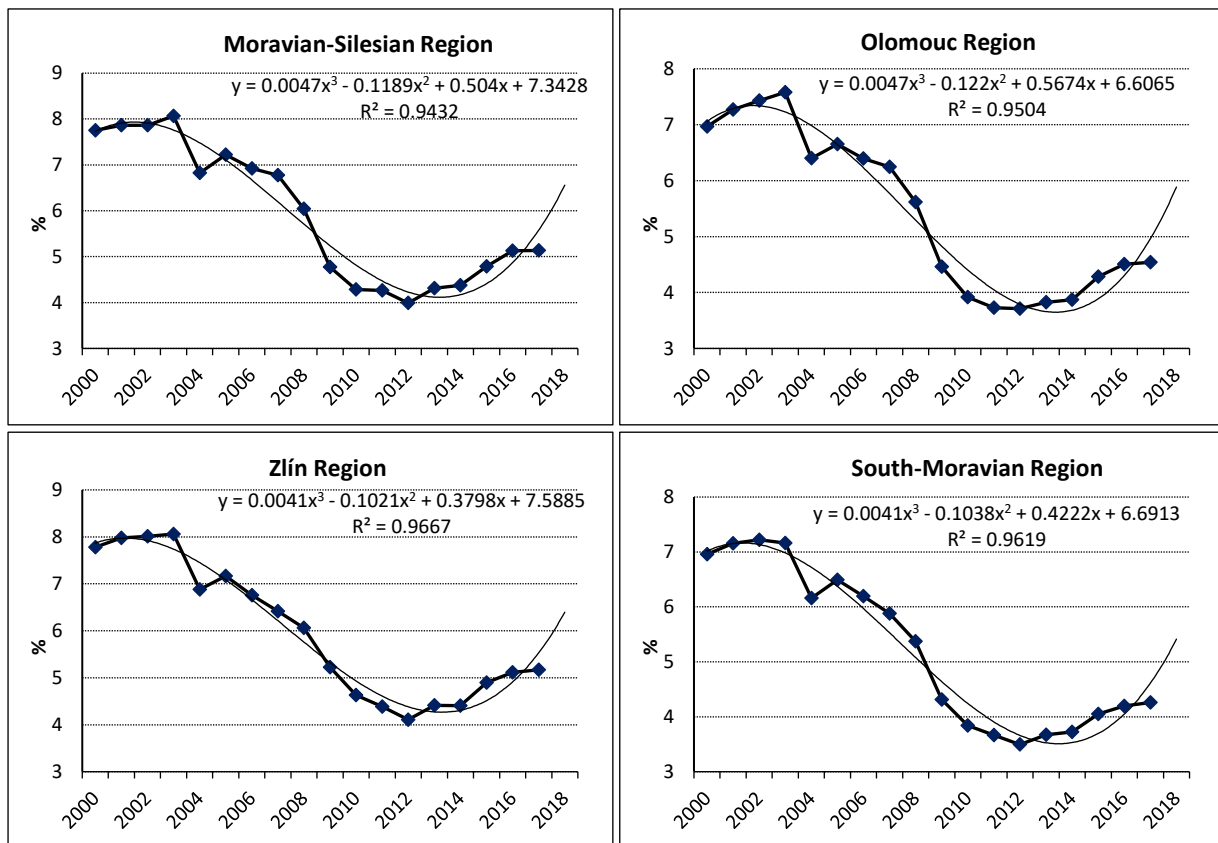
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Fig. 3. Development of the average percentage of incapacity for work (Source: CSA + author´s analysis)

However, in 2013, the average percentage of temporary incapacity for work increased year on year and the long-term decline, apparent from 2005, stopped. The development continued in the same trend in 2014, the average percentage of TIW increased year on year compared to 2013 and its average value was 4.1 in the Moravian regions. In 2015 the average percentage of TIW was significantly higher in comparison with the same period in the previous year and its average level reached 4.5 in the Moravian regions. The growth trend continued in the next two years, when the highest values of the average percentage of TIW were registered in the Zlín Region (5.2) and the Moravian-Silesian Region (5.1) in 2017.

5   Conclusion

This paper determines the effect of changes in sickness insurance on incapacity for work in selected regions of the Czech Republic using an elementary research method R^2 Index. It was found that legislative changes in sickness insurance significantly influenced the development of all indicators of temporary incapacity for work in individual regions. These changes are reflected most markedly in the indicators of the number of new cases of TIW per 100 insured persons, the average duration of 1 case of TIW and the average percentage of TIW.

In 2009, there was a rapid decline in the number of cases of incapacity for work, which stopped in 2013, when the values of this indicator slowly pick up an increasing trend. Differences in the incidence of temporary incapacity for work by territorial division are greatly influenced by the structure of employment, the nature of the prevailing economic activity and the unemployment rate in the region.

The longest average duration of one case of TIW is recorded in the Moravian regions. Between 2000 and 2017, the average duration of one case of TIW increased from 30.8 days to 47.6 days (by nearly 17 days). From the point of view of a more detailed territorial division, there is a greater dispersion of the values of this relative indicator.

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Since 2005, there has been a downward trend in the average percentage of incapacity for work, which has been strongly exacerbated by legislative changes in 2009. Developments in the downward trend of this indicator continued until 2012, in the following years, however, there were gradually increase to an average value of 4.8 in the Moravian regions.

Comparative indicators affecting different aspects of incapacity for work show that there have been significant changes recently. The question is whether these changes have led to an enlargement of regional disparities and the unfavourable situation still persists in the same regions or not. This fundamental research can also become the basis for further, thorough exploration of the issue, where could already be used more sophisticated methods.

6   Acknowledgement

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