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Dears Participants of the Conference

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

The tenth volume of this conference was held on September 19-21, 2012, Vendryně, 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 eleventh volume of "Economic Policy in the European Union Member Countries".

Dr. Michal Tvrdon
Vice-Dean of Science and Research
Silesian University in Opava
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CONTENTS

SUSTAINABILITY OF EUROPEAN ECONOMIC AND MONETARY UNION IN THE LIGHT OF EUROZONE SOVEREIGN DEBT CRISIS

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Abstract. Bursting of speculative bubble in US housing market at the end of 2006 firstly caused subprime crisis in US at the end of 2007 and then led to global financial crisis as of 2008. Fiscal stimulus packages, nationalization of banks and private debt to alleviate the negative effects global financial crisis over economy together with decreases in tax revenues led to European sovereign debt crisis by increasing sovereign debt in some Eurozone countries which already have had a significant amount of outstanding debt and current account deficits because of their savings gap and non-competitive economic structures. The debt crisis firstly emerged in Greece in October 2009 and then spread to Ireland, Portugal, Spain, Italy in 2 years. The deficiencies and weaknesses in EU organization (especially EMU and surveillance structures), which caused problems in coordination of economic policies and external imbalances, contributed to emergence and rapid spread of sovereign debt crisis. This study examines the role of European Economic and Monetary Union on the sovereign debt crisis and costs and benefits of EMU in the integration process and forecasts the future of EMU in the light of Eurozone sovereign debt crisis.

Keywords: monetary union, optimum currency area, Eurozone sovereign debt crisis.

JEL Classification: E20, F33, F34, F41.

1. Introduction

Economic integration process in the Europe began in 1951 with the 6- nation (France, Germany, Italy, the Netherlands, Belgium and Luxembourg) European Coal and Steel Community and EU has reached 27 member countries as of 2007 by keeping its enlargement. Stage of European Economic and Monetary Union (EMU) began with foundation of European Central Bank (ECB) in 1998 and the launch of the Euro as a new currency in circulation in January 2002. EU member countries can join the euro after meeting the Maastricht criteria. During the integration firstly European Monetary System (EMS), which was the precursor to EMU, was formed for coordination of monetary and exchange rate policies from 1979 until the early 1990's. After collapse of the Exchange Rate Mechanism (ERM), the Maastricht treaty laid the groundwork for transforming from the ERM to EMU by the creation of the euro and the ECB.

EU didn't take the necessary lessons from ERM crisis which was sign of a more severe crisis in the future, and now EU has been facing a sovereign debt crisis which poses a threat to the EMU as of October 2009 after 2008 global financial crisis. Eurozone sovereign debt crisis burst out when investors worried that a Greek default would have started a chain reaction across Eurozone following Greece's debt admission in October 2009 and then crisis spread Ireland, Portugal, Italy and Spain in 2 years.

2. The Role of EMU on Eurozone Sovereign Debt Crisis

Bursting of speculative bubble which occurred in US housing market between 1997–2006 firstly caused sub-prime crisis in US at the end of 2007 and then led to global financial crisis in the last quarter of 2008 by spreading all over the global financial markets. Eurozone countries, which reacted to global financial crisis nearly in a similar way, faced fiscal distress due to heavy borrowing practices, property bubbles and living above their means (Sandoval et. al., 2011). Eurozone sovereign debt crisis burst out when investors worried that a Greek default would have started a chain reaction

across Eurozone following Greece's debt admission in October 2009 and spread Ireland, Portugal, Italy and Spain in 2 years.

EMU is a kind of monetary union which has centralized monetary union and a decentralized fiscal system. At the first stages of the establishment of EMU, a number of challenges, weaknesses or deficiencies in the construction of the EMU were suggested. These can be grouped under four main headings (Jonung, 2002):

- the process for fiscal policymaking (The absence of central co-ordination of fiscal policies within EMU in combination with the Maastricht criteria for domestic debt and deficits is a common source of objection. According to many economists, this legal framework implies that EMU will not be able to respond to asymmetric shocks and disturbances in a satisfactory way.),
- the process for monetary policymaking (Several weaknesses in the institutional framework (such as lender of last resort, financial supervision, division of monetary power, accountability and transparency) for monetary policy-making have been pointed out.),
- the euro zone as a non-optimal currency area, and
- the legitimacy of EMU (EMU is lacking political legitimacy and acceptance: EMU and the institutions surrounding EMU such as the ECB, the euro and the Stability and Growth Pact (SGP), are not "embedded" into a broadly accepted political structure).

The sovereign debt crisis clearly verified above mentioned deficiencies and weaknesses in the construction of the EMU. Fiscal policies of the some Eurozone member countries have hampered the functioning of the EMU. Some Eurozone countries began to violate the Maastricht criteria of the Stability and Growth Pact in particular in budget discipline long before the crisis. Many Eurozone countries launched fiscal stimulus packages, nationalized banks and private debt to alleviate the effects of global financial crisis, but these measures - together with decreases in tax revenues - contributed to the increases in public debt which was one of the main reasons of sovereign debt crisis. Public debt levels of these countries exceeded the euro's stability criteria. Public debt level to GDP in Greece, Ireland, Spain and Portugal respectively increased to 15.8%, 14.2%, 11.2% and 10.1% in 2009 (see Fig. 1).
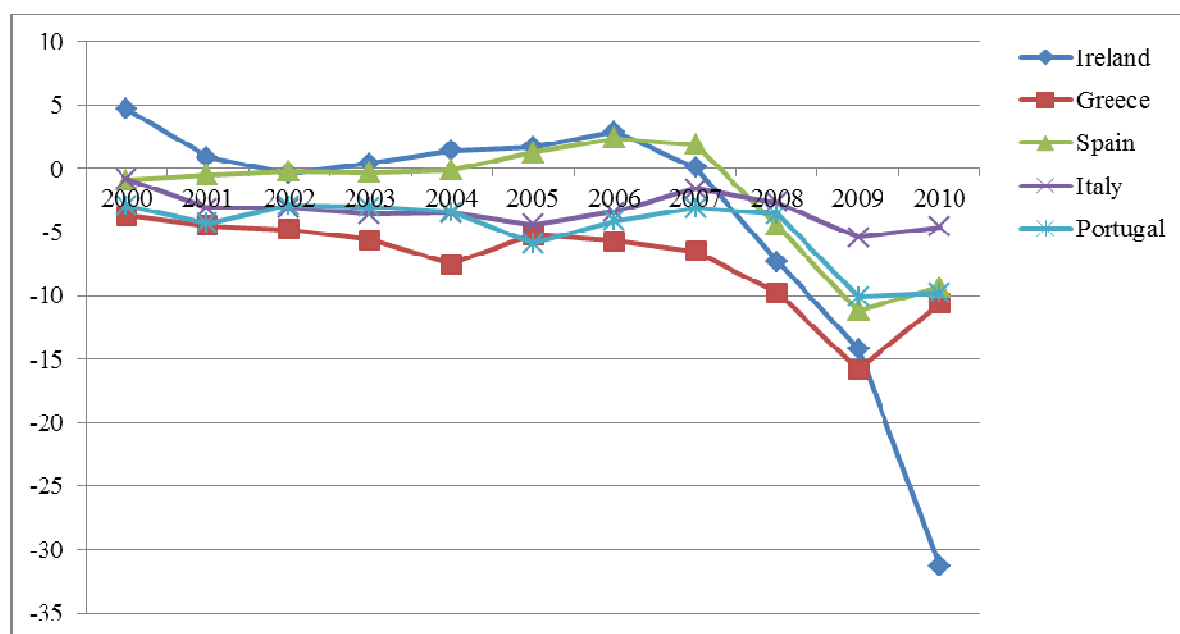
Fig. 1. Sovereign Debt Rates of Selected Countries in Eurozone (Percentage of GDP) (Source: Eurostat,a).

Optimum Currency Area (OCA) was defined "a domain within which exchange rates are fixed" by Mundell (Mundell, 1961). The forming of a currency area causes to members' countries to lose its

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direct control over the monetary policy and exchange rate. Theory of OCA, which firstly proposed by Mundell in 1961, was developed to pave the way for exploring the criteria as well as the costs and benefits of forming a common currency area. Consequently the following criteria are needed to compensate the loss of these economic policy instruments in question to maintain equilibrium within the context of OCA (Mongelli, 2002):

- price and wage flexibility (Friedman, 1953),
- production factors mobility (especially labour mobility) (Mundell, 1961),
- existence of positive shock correlation among countries (Mundell, 1961; Corden, 1972)
- trade integration/degree of openness (ratio of tradables to non-tradables (McKinnon, 1963),
- diversification in production and consumption (Kenen, 1969),
- convergence of inflation rates (Fleming, 1971),
- integration of financial markets (Ingram, 1962),
- fiscal integration (Kenen, 1969),
- similarities in economic shocks,
- political integration (Mintz, 1970).

The above criteria are weighted differently in various studies for searching costs and benefits of OCAs, in conclusion we can say that there is no consensus for these criteria. Based on the above criteria, EMU seems not to be an OCA from the beginning, and also transition to economic and monetary union is a political decision rather than economic decision.

The credit and monetary policy in the Eurozone reflects the averaged circumstances in all the countries of the EMU. However, with typologically different countries, the same anti-cyclic measures can yield entirely different results in various countries (Institute of World Economy and International Relations Russian Academy of Sciences, 2010). Adopting the euro as common currency and the use of uniform monetary and credit policies in typologically different Eurozone countries failed to satisfy balanced growth. Some countries such as Germany, the Netherlands gained advantage, while some countries such as Greece, Portugal were adversely affected from this case.

The ECB coped with its main task to maintain the euro's purchasing power and thus price stability in the euro area. However, in a worsening economic situation, the coordination of other economic policy guidelines regulated at the national level (within the scope of the general economic policy of the Community) turned out to be not quite adequate. An imperfect coordination mechanism decreased the effectiveness of the whole economic policy. From time to time, the ECB had disagreements with national governments regarding the way to resolve the emerging economic problems (Institute of World Economy and International Relations Russian Academy of Sciences, 2010). ECB also eased and thus encouraged the economically troubled countries such as Greece, Ireland, Portugal, Italy, Spain to spend excessively by keeping interest rate premiums over these countries national public debt low. Borrowed funds by these countries were used to fund current consumption instead of using in productive investments which will create economic growth and new resources to pay off debt and increase the competitiveness of their economy. This in turn caused to increase debt stock continuously. Decline in creditworthiness of these Eurozone countries, which had a continuously increasing debt stock, affected risk perceptions about these countries negatively following global financial crisis. And increase in riskiness of these countries caused substantial increases in long term borrowing rates of these economically troubled Eurozone countries and/or shortening of average debt maturity of these countries in question that posed risks to the economy.

Eurozone debt crisis partly arose from sharp increase in external imbalances. Eurozone sustained relatively a balanced current account with regard to the rest of world from 1999 to 2010. But there were large and unsustainable imbalances in the Eurozone. Germany became the world's largest exporter after unification and all northern European countries took advantage of expanding market

and non-competitive economies of south European countries. There was a sharp separation between core (Germany) and peripheral countries (Greece, Ireland, Portugal, Italy, Spain) (Lapavitsas et al., 2010). Loss of competitiveness in peripheral countries caused systemic current account deficits in peripheral countries and current account surpluses in Germany. Although Germany had a remarkable increase in its export, its currency didn't appreciate at the same rate due to use of common currency in Eurozone. Because economically weak southern Eurozone countries caused a downward pressure on euro. On the other hand although southern Eurozone countries had substantial current account deficits, euro didn't depreciate sufficiently because of common currency as well. As a result while Germany had significant increases in its export sector, euro posed one of the biggest obstacles versus economic recovery of southern Eurozone countries. Current account deficits of Greece, Portugal, Spain and Ireland reached 14,9%, 12,6%, 9,6% and 5,6% respectively in 2008 (see Fig. 2).
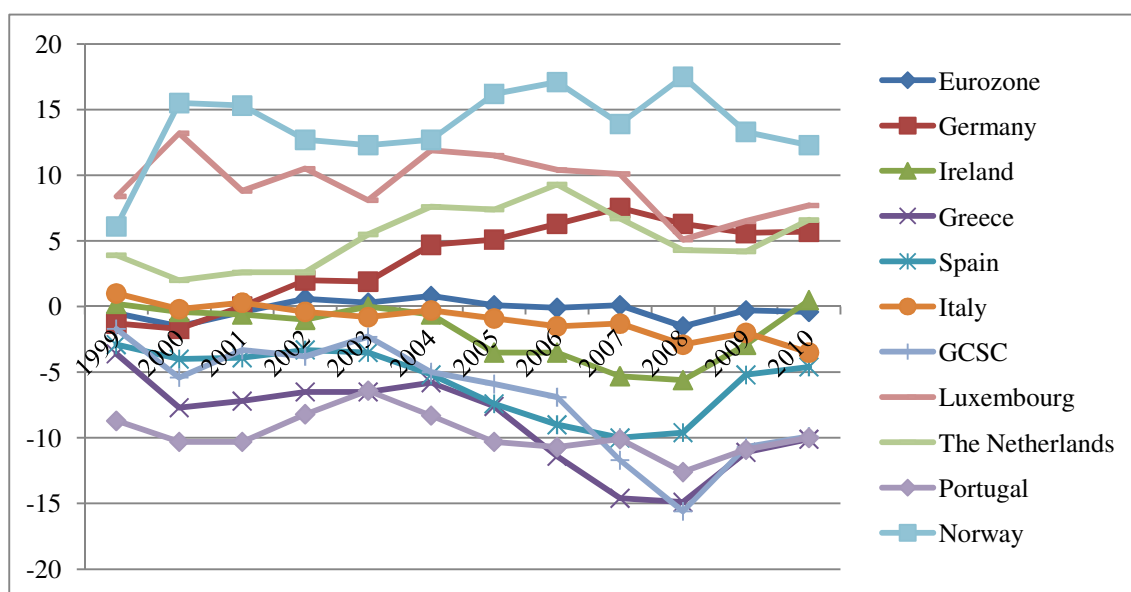
Fig. 2. Current Account Balance of Selected Eurozone Member Countries (Percentage of GDP) (1999-2010) (Source: Eurostat, b).

Consequently there are structural reasons and problems in coordination of economic policies behind Eurozone sovereign debt crisis. As mentioned above common currency and uniform monetary policies in Eurozone countries, which have different economic structures, were mainly causes of this crisis in question and also are forming an obstacle for recovery of these countries in a shorter time and cause crisis to spread in EU.

3. Evaluation of EMU and Predictions about the Future of EMU

On 1 January 1999 the final stage of EMU commenced with the conduct of a single monetary policy under the responsibility of the ECB and the euro was introduced to world financial markets as an accounting currency. The ECB has maintained price stability in the Eurozone since beginning of final stage of EMU, on the other hand euro has shown very volatile performance relative to USD (Fig. 3 and 4).
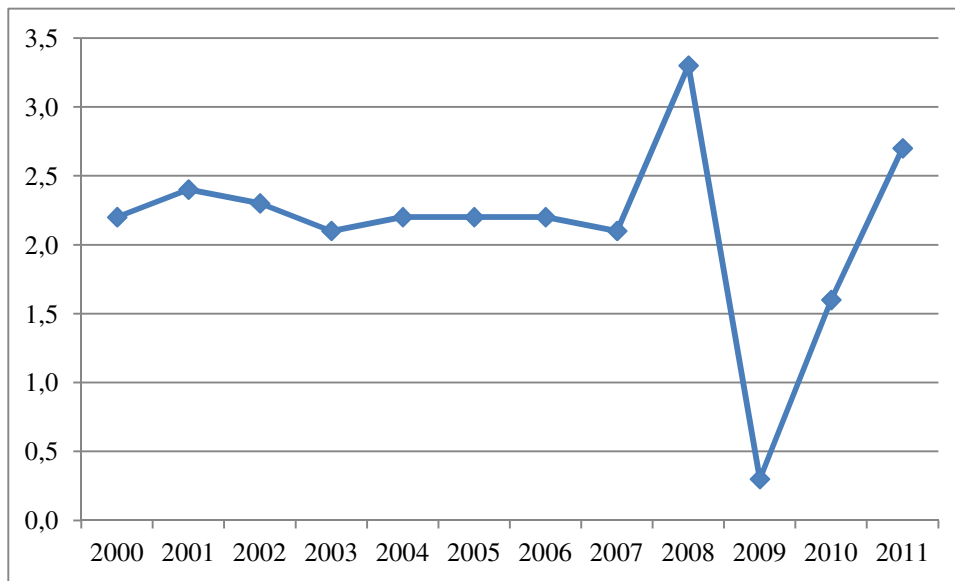
Fig. 3. Harmonised Indices of Consumer Prices in the Eurozone (17 countries) (Source: Eurostat, c).

Fig. 4. Euro versus United States Dollar (Source: European Central Bank).

Investors began to believe there would be convergence economically among Eurozone countries after the beginning the final stage of EMU. And also anchor function of economically advanced countries such as Germany, France and the Netherlands in EMU and ECB's conducting monetary policy prudently changed the risk perception of investors to positive and caused significant declines in borrowing costs of these countries. Therefore capital flowed from the centre and the rest of the world to the peripheral countries. Consequently especially Greece, Ireland and Spain realized better economic performance relative to Germany; we can say that a partial convergence happened in the Eurozone in the Fig. 5.
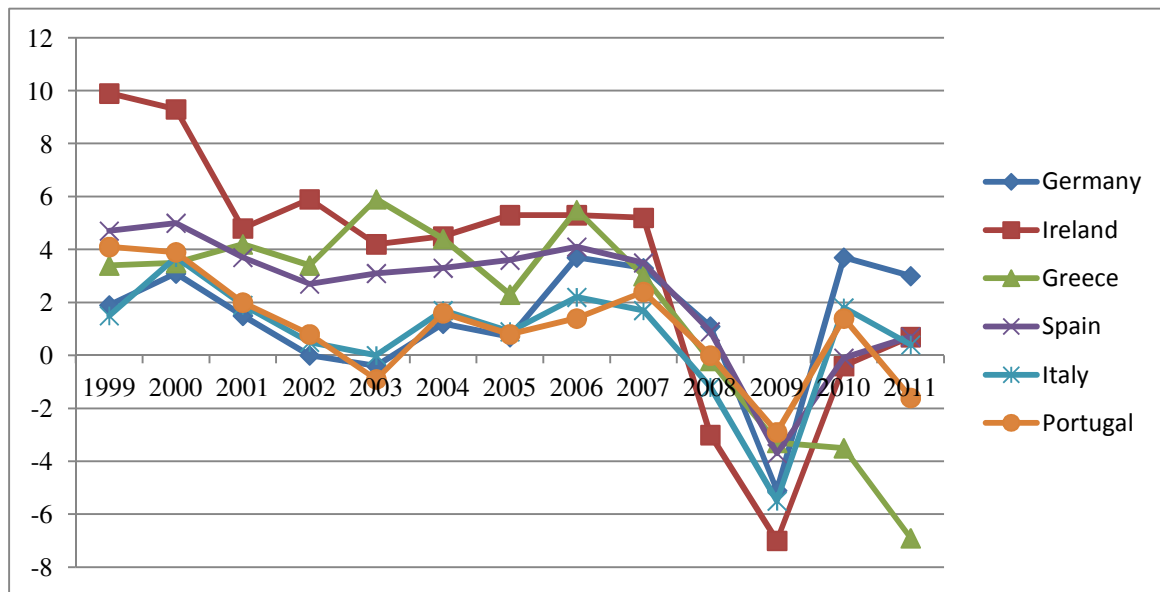
Fig. 5. Selected Eurozone Member Countries' Real GDP Growth Rate (Source: Eurostat, d).

While the transition of the final stage of EMU has increased macroeconomic stability and furthered trade and financial integration partially, the sovereign debt crisis clearly shows that there are some deficiencies and weaknesses in the EMU. Main causes of the Eurozone sovereign debt crisis such as structural reasons and problems in coordination of monetary and fiscal policies which arose from differences in both development levels and competitiveness of economies of Eurozone countries and the unsustainable current account and budgetary deficits of some Eurozone countries in debt crisis verify that the infrastructure of the EMU was not well-founded. While monetary policy is conducted by ECB, fiscal policy is conducted by national authorities provided that the criteria adopted by Maastricht Treaty and Stability and Growth Pact are ensured by Eurozone member countries. But the surveillance mechanisms of EU failed to check the economic performance of Eurozone member countries and limit them on time. And also some Eurozone countries such as Greece, Ireland, Portugal and Spain failed to implement the fiscal criteria in question in time and even Greece government misinformed EU institution and investors about its fiscal position for a long time.

The economically troubled Eurozone members' recovery from crisis only by themselves don't seem possible, because these countries transferred management of monetary policy, which is a key instrument for fighting against debt crisis, to ECB and related institutions in the EU and these countries don't have many options other than austerity measures. So the problem doesn't belong to only countries in debt crisis, and it is all EU's problem. But EU failed to take necessary measures at the beginning of debt crisis by thinking the crisis as a short-term liquidity problem. After the rapid spread of crisis in Eurozone and the negative effects of the crisis on the Eurozone economies and euro, The EU took measures aimed at primarily:

- solving the debt problem,
- increasing the competitiveness of EU and member countries,
- strengthening economic governance of EU.

If the EU didn't support these countries politically and financially in the short term, these countries could turn to different measures such as leaving Eurozone and which in turn could lead a chain reaction within the Eurozone. And also success of the policies which has aimed at diminishing the heterogeneity in the areas such as competitiveness of economies, economic and financial structures of Eurozone member countries will contribute to economic recovery. These issues are crucial for the future of EMU. One of the determinants for the long run success of the EMU is the political

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integration, which substantially depends on political choices and responses to the measures of the people of EU member countries. Political unification is needed to reduce the scope for asymmetric shocks and to embed the Eurozone in a wider system of political ties that are needed to deal with the divergent economic movements within the Eurozone (De Grauwe, 2006).

4. Conclusion

Eurozone sovereign debt crisis emerged firstly in Greece in October 2009 and then spread Ireland, Portugal, Italy and Spain in short time. The crisis was arisen from the structural reasons (such as differences in both development levels and competitiveness of economies of Eurozone countries, saving problems) and problems in coordination of economic policies. Although EMU has provided price stability, partial convergence in the Eurozone since 1999, the deficiencies and weaknesses in the structure of EU (especially EMU and surveillance) played a key role in the emergence and spread of debt crisis. And also studies about the evaluation of EMU in the context of OCA have shown that EMU is not an optimum currency area from the outset.

While management of monetary policy is in the hands of ECB, the control of fiscal policy is in the hands of Eurozone member countries. So these countries can't recover from the crisis only by their struggles. Therefore the Eurozone countries in sovereign debt crisis need a very coordinated monetary and fiscal policy for the economic recovery. A strong coordination between EU relevant institutions and Eurozone member countries are required. Otherwise this crisis may cause some countries to leave EMU, even be end of EMU. Of course narrowing Eurozone is another option for better and stronger euro. But these two cases may probably cause permanent damage in the European integration process. EU should take more severe aggressive measures to sustain EMU, since EMU is forming one of the crucial stages in EU integration process. In this context EU should:

- diminish the heterogeneity in the areas such as development levels, competitiveness of economies, economic and financial structures of Eurozone member countries,
- revise EMU structure and economic surveillance organizations in the EU,
- further fiscal integration or strengthened the rules governing budgetary discipline in Europe,
- further political integration.

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COMPARISON OF THE SOCIAL BENEFIT SYSTEM CONSTRUCTED BY LEFT-WING AND RIGHT-WING PARTY RULED GOVERNMENT

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Abstract. Social policy represents the accomplishment of human society. In the last year governments reach the statement that social policy exceeds limits of financial capacity. It is not possible in future to sustain so enormous government expenditures. This paper focuses on finding which government - left-wing or right-wing oriented – spend less of the state budget and motivated unemployed more to finding a job. Analytical method METR(EP) is suitable instrument for this analysis. This method answers, which household represents the biggest threat in terms of low income for the state budget. Government thus do not obtain tax income and vice versa, is obligatory according to law to pay out social benefits and allowances these individuals. At the same time METR(EP) gives economics reasons why unemployed do not find a job.

Keywords: benefit, government, household, income, individual, wage.

JEL Classification: J22, J31.

1. Introduction

The article focuses on a comparison of the social system under the rule of left-wing parties and right-wing parties in the Czech Republic. These parties have totally different views on the concepts of justice, solidarity and social affairs. This implies a different view of the social system. The problem is which of these two systems are more generous and demotivate the unemployed from seeking jobs and de facto remain in the state of unemployed.

In the Czech Republic there was never a purely left-wing or right wing government. The ruling party has always had to set up a coalition that could reach a dominant position. Thus, we cannot talk about purely left wing or right wing government, but because it had always a majority in the coalition, therefore it is usually so named. Left and right-wing government after winning elections pursued the policy in compliance with its program and beliefs of social policy. This has been achieved by changing the methodology of calculation, changing coefficients or even level of social benefits. Therefore we decided to compare the years 2005 and 2008, when these governments were already for some time in power and at the same time ruled the all year round without interruption.

The goal is to find out how governments were successful and influenced positively the labour market. Analytical method METR(EP) will be used to analyse their policies. The results reveal to the unemployed if it paid off to work or not, and to the government if it was issuing more money from its budget. This statement is based only on the basic economics logic and does not consider other factors.

2. The state and its social function

The state can realize its basic functions[1] only if there is greatest possible number of taxpayers and the minimum number of citizens to which it distributes transfers (Kubatová, 2000). Otherwise, it fails to fulfil its three functions and is often the first failure that occurs in redistribution function i.e. payment of transfers. Today many developed countries in the world are abandoning the politics of the welfare state because they cannot afford it. They live above its conditions and create a budget deficit. Expenditures are greater than revenues. The public debt of the Czech Republic has exceeded 1600

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[1] The three basic functions of the state are allocation, redistribution and stabilization (Kliková and Kotlán, 2006).

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billion crowns[2]. It can be seen that present governments of both political directions were not very economically successful.

The other side is how the government takes care of its citizens. Whether social system set up by the parties is motivating or demotivating to find a job. The working citizens are obliged to pay taxes and do not receive any social security benefits.

Right-wing parties pursue their idea of minimal state. They support the market environment, which should have a minimal state involvement. Citizen must take care of himself or his family take care of him. State intervention is the last option (Lierse, 2012). In contrast, left-wing parties are actively intervening in the market environment and seek to achieve a better solution than the market using restrictions and regulations (Garrett and Mitchell, 2001). These parties have set their social systems according to these assumptions. Česká strana sociálně demokratická governed in the years 1998 – 2006, Občanská demokratická strana governed in the years 2006 – 2012. For left-wing government was chosen year 2005 and for the right-wing government year 2008. The reason is the continuity of particular government in a given year.

In the short term no government can solve problems such as an aging population. Extinction of the Czech nation is a problem that cannot be dealt with within one election period (normally 4 years), especially when indications of that phenomenon have been witnessed in the Czech economy for over 20 years. However, governments may in the short term reduce other social problems through economic instruments. These can include the unemployment rate or the rate of economically inactive population.

The government should always be concerned about is whether people, who receive support in unemployment or other social benefits, cannot work. Government would receive taxes and might not pay off transfers and do not burden expenditure side. The government has got instruments, which can change the situation in a given area.

No matter the government political orientation. The government should influence the citizens to not see advantages in unemployment and relying of social benefits, but motivate them in job search or keeping an existing one. These goals can in the short term guarantee more or less only non-transparent system of social benefits for citizens. The more complicated the system seems, people understand the system less and therefore it is less likely that they can exploit the system to their advantage. Another option is to create a system of social benefits that does not to support people relying on social benefits, but rather is motivates them find a job.

3. The problem of unemployment

The labour market is a market of the specific commodity[3] that is being traded. The human being has needs and desires that it wants to satisfy. At the same time it tries to minimize its sacrifice in favour of their fulfilment. It is an economic logic, when the economic subject seeks to maximize pleasure and minimize the sufferings that come with the achievement of that pleasure. For this reason, people may prefer the status of unemployed against the status of employable (Immerwoll, 2002).

Unemployment is a big problem (Mankiw, 1999). Although, it primarily affects individuals and at different levels - economic[4,] social and psychological[5], political[6]. It has also an impact on the state in the form the aforementioned transfer payments (social benefits, unemployment benefits). It can also result in increased expenditure on security due to the growth of social tension that tends to grow in

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[2] According to Ministry of Finance of the Czech Republic (Ministry of Finance of the Czech Republic, 2012).

[3] Commodity is human labour, and only a man can provide it.

[4] Household budgets must be changed due to a reduction of income.

[5] An unemployed person gets to the stress created by itself or its surroundings. There are doubts about himself.

[6] A person without a job often re-evaluates their voting preferences.

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times of increased unemployment. Increased spending leads to growth deficit. Unemployed citizens transfer repayment to future generations - intergenerational funding (Tabellini, 1989).

The Czech Republic is facing unemployment since its foundation in 1993. Unemployment increases in times of recession, while decreases in times of an economic boom. However, this is related to the total quantity of unemployment. Really a serious problem for the economy is structural unemployment (Pavelka et al., 2012). It is a long-term in nature and affected people often do not enter the labour process again. This is a permanent component of unemployment.

It is necessary to mention the division of the labour market on primary market[7] and secondary market. It is known as a dual labour market (Reich et al., 1973). The secondary labour market is usually a source of structural unemployment. Unemployed often have to accept wages at minimum wage[8] level. In this case it threatens that the social benefits and unemployment benefits are the same or only slightly lower than the minimum wage (Schneider and Jelínek, 2001). It is clear that this situation discourages the unemployed person to find a job. Unemployed does have disposable leisure time and tends to work illegally. The employer has an aversion to employ such an individual (Šimek, 2007).

There is no dispute between the policies with regard to social benefits. They certainly differ in opinion on how broad this assistance should be and what target group should be supported. The left-wing government tend to increase that range. The right-wing government would strongly reduce it.

Method that can calculate the individuals whether to remain in a state of employment or unemployment, is called the marginal effective tax rate per employed person (METR(EP)). In the next chapter there will be explained the logic of this analysis and evaluation of specific types of households in the Czech Republic between 2005 and 2008.

4. Marginal effective tax rate and the situation in selected types of households in the Czech Republic

Marginal effective tax rate for employed persons is used for the analysis of efficiency of the tax and benefit system on the labour supply. It represents an enormous change of view on the labour market from the average individual to microeconomic foundations. This method began to be used by the OECD and the European Union to calculate various types of families in society.

The formula of METR(EP) is as follows:

$$METR(EP) = 1 - \frac{\Delta NEI}{\Delta GEI} \tag{1}$$

where ΔNEI = change in net income and ΔGEI = change in gross income (Pavel and Vítek, 2005).

Change in net income is defined as a function of change in gross earned income, the marginal tax rate including contribution to social and health insurance paid by the employee and the rate of decreasing the value of social benefits. The indicator is affected by the change in gross income, taxes and social benefits. Taxes include personal income tax and contribution to social and health insurance paid by employee. Social benefits relevant for the calculation are only those which are derived from the amount of income of the taxpayer or his family.

The resulting value of METR(EP) represents how many percent taxpayer effectively pays if his gross income increases by one unit (Pavel, 2005). In a system where social benefits are constructed as the difference between after tax income and the subsistence minimum, the rate benefit reduction is 100 %, which means that these benefits are reduced by the same amount that represents the increase

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[7] People in the labour market are highly qualified and experienced.
[8] The minimum wage was 7185 CZK in 2005 and it was 8000 CZK in 2008.

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of the earned income after tax. Therefore, if the value of METR(EP) exceeds 1, the increase in gross income represents reduction in net income (Jahoda, 2004). In this case it would be irrational to increase labour supply and the taxpayer gets into the poverty trap (Deleeck et al., 1992). In this case the benefits system discourages a person from working.

Focus group must be clearly defined prior the calculations i.e. individual, the family household (Jahoda, 2006). In our case, we focus on the most frequent households in the Czech Republic. Only these groups (types) will be observed: an individual who works (i.e. 1+0+0)[9]; a household with two adults, where one does not work (i.e. 1+1+0); a two-adult household where both adults are working (i.e. 2 +0 +0); a family with two children, where one of the adults does not work (i.e. 1+1+2); a family with two children, where both adults are working (i.e. 2+0+2). We are most interested in the chosen cases, because of the representativeness of households in the structure of the Czech Republic that in addition represent the limits of other marginal cases (Prušvic and Přibyl, 2004). This method can also be used for modelling households with for example a disabled child, or with other specific problems, such that the second member of the household is working, has not 100% of the gross average wage (e.g. 67% or 33% of the gross average wage).

In the case of the net income calculation possible bonuses, discounts on taxes and tax-deductible items have to be counted that were valid in the given year and the household was entitled to them. Social benefits are taken in an amount to be valid in December of the given year[10]. The housing benefit was selected as 35% of average net wages minus the discount for the taxpayer (other items are not considered). Model households are set to be living in rental apartments and it's the total rent is considered. This amount was determined on the basis of empirical data for the municipality in the range from 10000 to 49999 inhabitants. Children in model households are between 6 to 10 years old. Those children of that age it is not possible for both parents to be on maternity leave and children are not able to take care of themselves. The unemployed individual is not entitled to unemployment benefits because it belongs to a long-term unemployed group. It only receives social security benefits. This is a situation when social benefits substitute employment income.

In this article, calculations are made only for the year of 2005 and 2008 and are calculated based on data from December of that year. The year 2005 is influenced by the left-wing politics and vice versa the year 2008 by the right-wing politics. In 2005 the wage is calculated in the system of progressive taxation. In 2008 the wage was already counted in a system of equal (same) tax rate. Change occurred in the calculation of social benefits and quite a big change has been made in child benefit. In these years, the average gross wage was different and also values in the formulas for the calculation of social benefits were altered. This discrepancy allows us to compare how the government encouraged employees to find work and that allowed them pay taxes instead of receiving social benefits.

METR(EP) takes into account several variables. The formula (1) shows that the first variable is the gross income that can be obtained from the Czech Statistical Office. The second variable is the net income, which consists of calculated net wage according to the laws applicable in the given year (Ženíšková, 2010) and social benefits to which is household entitled. Formulas and values needed for calculation can be found at the Ministry of Labour and Social Affairs of the Czech Republic. The procedure of calculating of net wages and social benefits can be found in previous work (Beran, 2012).

Social benefits claimed by households are among the standard social benefits (Břeská et al., 2010). Those transfers (Act No. 117/1995 Coll) include housing benefit (Act No. 110/2006 Coll), child benefit, social benefit, the benefit in material poverty – allowance for living, the housing supplement in

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[9] Explanation of numbers: 1+0+0 = the first number represents the number of employed persons in the household, the second number of the unemployed and the last represents the number of children.
[10] It has happened several times in the past that social benefits have changed during the calendar year and not always from the beginning.

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material poverty (Act No. 111/2006 Coll). These benefits are not affected by the household member's state of health or its need for a day care.

The default values of the average gross wage are 18 344 CZK for 2005 and 22 592 CZK for 2008. The increase in the x-axis (the average gross wage) is always about 1 percentage point. Concerned individual will offer more of his work, for which he gets paid the value, but he will lose social benefits.

The results of METR(EP) are due to the extensiveness and easier illustration presented only graphically. Each result for given type of the household is represented by pair of graphs, where the left graph is for the year 2005 and the right graph for the year 2008. The x axis is given as a percentage of average gross wage and the y-axis value of the indicator is the METR(EP) in the index format. Value of METR(EP) can be found in the interval $(-\infty, \infty)$[11]. The fundamental interval is (0, 1). A value of 1 represents the point where is not convenient to work (Jahoda, 2004). At that point the social benefit is a complete replacement for a wage. Hence, that the person does not work and receives social benefits. If the individual will go to work it can earn less than the amount of social benefits it claims.

There is always a certain interval of the average gross wage where it is disadvantageous to start working and getting income. An individual loses his free time, because it begins to work, and paradoxically gets eventually less. Although the government saves on the expenditure side and gains on the revenue side under such conditions, but the household, who gets into this situation, does not perceive it so optimistically (Kolář et al., 2005). It would be irrational for the individual to start working.

Different authors (Immervoll, 2002) or (Pavel, 2009) suggest that the demotivation value range is between 0,6 and 0,8. But there are also scholars who already consider a limit of demotivation at 0,3 up to 0,5 (e.g. Haveman, 1996)[12]. The lower METR(EP) indicator gets, the greater should be the willingness of people to work (Carone et al., 2004).

The first type of observed households is the "1+0+0". It represents an individual who has never worked before and starts to work.
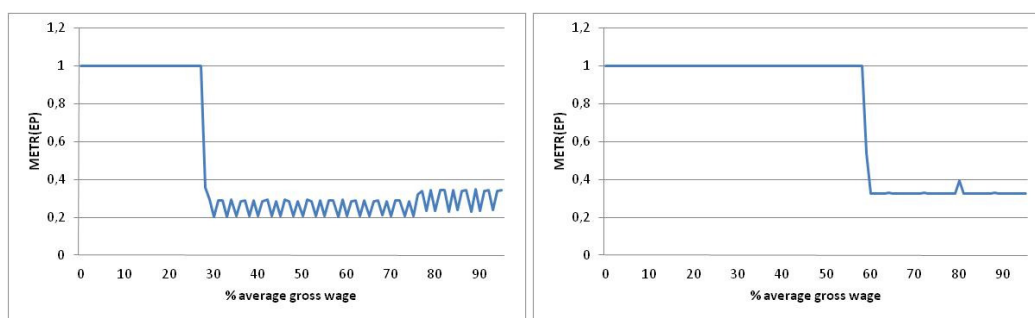
Fig. 1. One-person household – 1+0+0 (Source: Czech Statistical Office and own elaboration).

As the Fig. 1 shows, developments in the social welfare system really occurred. In 2005, the last payment of social benefits was at the 28% average gross wage level. For this type of a household it was always worth to work when it could earn at least 29% of average gross wages[13]. In 2008, the net wage was calculated differently (switch to the equal tax of calculating the natural personal income tax), so it has affected the value of METR(EP). To an individual it was paid off to work when it could earn at least 59% of average gross wages.

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[11] Infinity is only a hypothetical example. In reality, the result will move in lower values. In our analysis the results did not work out the value of over the interval (-10.10).

[12] They are not Czech authors and it is not the analysis of the Czech Republic.

[13] From this point it earns more money to work because it already is not able to claim any social benefit.

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The second type of monitored households is the "1+1+0". It represents a two-person household where the first adult is unemployed and the latter adult starts a job. The household receives social benefits, but their amount is reduced when the latter individual supplies more and more work.
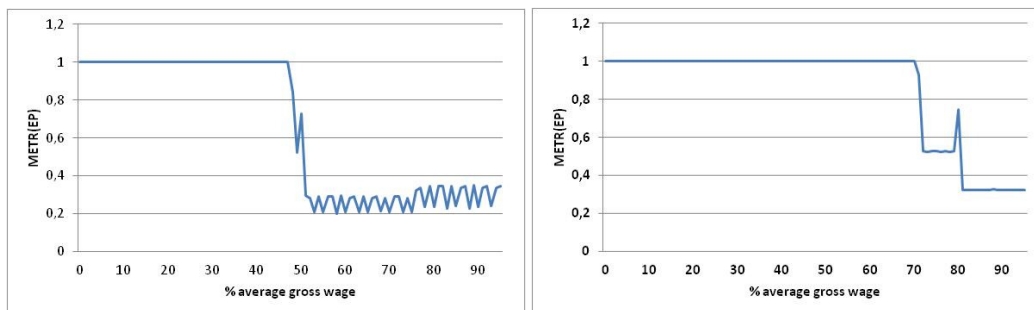
Fig. 2. The two-person household – 1+1+0 (Source: Czech Statistical Office and own elaboration).

The Fig. 2 again indicates a noticeable difference between given years. There is a similar shape of the curve as on the figure 1. The graph in years 2005 and 2008 shows a decline, then a slight rise and decrease again. The first drop in both cases is caused by the termination of the material poverty supplementary payment. In 2008 the material poverty supplementary payment was divided into the allowance for living and the housing supplementary in material poverty. The second decrease is caused by the termination of the housing benefit. In 2005, the first decline occurred at 49% of average gross wages level and the next at 52% of the average gross wage level. In 2008, the first decline occurred at the 72% of average gross wages level and the next in 82% of the average gross wage level.

The third type of monitored households is the "2+0+0". It represents two-person household, where both individuals work. The first adult works and earns 100 % of average gross wage. The latter begins to work. At 0 % level of average gross wage they possess 100 % of average gross wage of one-person household and at 100 % level of average gross wage they have twice average gross wage.
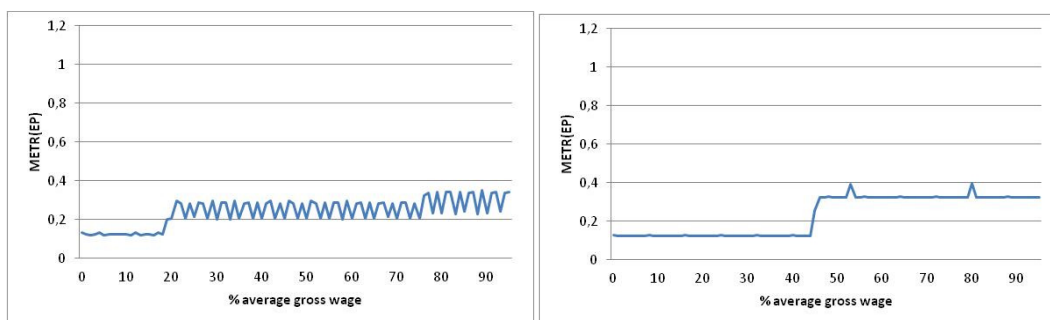
Fig. 3. The two-person household – 2+0+0 (Source: Czech Statistical Office and own elaboration).

On the Fig. 3 the METR(EP) value is the lowest of them all. Such a household is always motivated to work and cannot rely on benefits. It would not be economically rational for it to have a member of that household in the unemployed state. Due to non-payment of social benefits, the household members are not threatened with economic demotivation that is experienced by the previously unemployed individuals. From an economic point of view the unemployed was motivated to find a job all the time because its income can only increase. If the individual was unemployed in this type of a household, it would be for other than economic factor reasons. Lower values of METR(EP) at the beginning are caused by tax default. In 2005, the individual became a taxpayer when its income reached the 21% level of the average gross wage. In 2008, the individual became a taxpayer at 47% level of the average gross wage. But even after the individual can still find itself in the interval METR(EP) that motivates him to find a job.

The fourth type of observed households is the "1+1+2". This household has 4 members: 2 children, an unemployed adult, and an adult that has increasing gross wage. The household is entitled to additional benefits - child benefit and social benefit. Because they have two children, they claim double child benefit and tax discount on children.
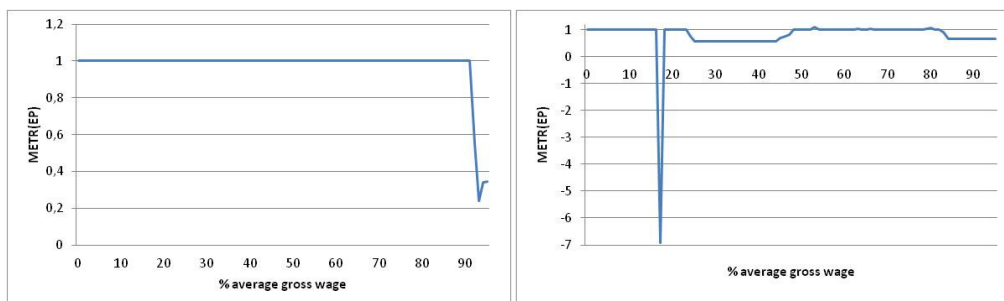
Fig. 4. The four-person household – 1+1+2 (Source: Czech Statistical Office and own elaboration).

Fig. 4 illustrates the situation of households, that has on the contrary, in terms of values METR(EP), the highest long-term value. In 2005, for individuals of this type of household it did not paid off to start working when having an income at 93% level of the average gross wage. From this point the individual is motivated to find a job because they lose their entitlement for housing benefit, social benefit, housing supplement and the child benefit is reduced from the first range to the second. In 2008 there appears an extreme negative value of - 6.91 at 18% level of average gross wage and it was due to the fact that the household could take advantage of discounts on the child for the first time. This advantage, however, declined rapidly and terminated at 86% level of the average gross wage. It is also necessary to note that in reality this discount can never cover the costs of a child care. METR(EP) was getting over the risk interval and even a value of 1 from 47% of the gross average wage to 85% of the average gross wage. This household also represents a big problem today. There is a high probability of adjustment to low income or illegal work. Household with this income cannot sustain two children. There is a high probability occurrence of the phenomenon known as inherited unemployment. Neither left nor right-wing government failed to remove the demotivating effect that threatens this type of a household. A large share of this condition is influenced by the support of families with children (Průša, 2004). This support is focused on solving their other problems they face in the Czech Republic. Nevertheless, the government should try to eliminate this phenomenon from the economy because parents are passing related habits to their children. The government of any political direction should explain to members of concerned household that improvement in the long run is possible only by active participation in the labour market. In the short run, however, the household is worse off.

The last type of observed households is the "2+0+2". It has four members: two children, an adult with earnings of 100 % and the latter adult has increasing gross wage. This model household is considerably similar to the "2+0+0" type. The average gross wage is developing at the same rate. The difference occurs when the net wage is due to the entitlement discount on the child and net income is due to entitlement to social benefits, as in the case of 1+1+2.

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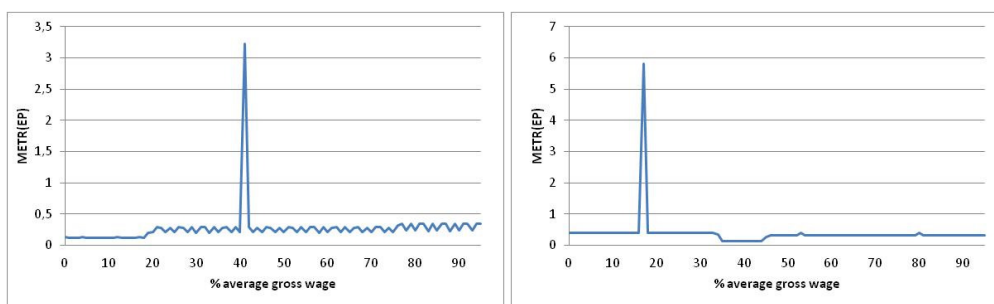
Fig. 5. The four-person household – 2+0+2 (Source: Czech Statistical Office and own elaboration).

The Fig. 5 looks different to the others because it has a modified scale. The value of METR(EP) does not end at 1.2 on the y-axis as usual, but here ends at value of 3.5 in 2005 and at value of 7 in 2008. This is due to outlying values, because at that point the household lost child benefit. The other values of the METR(EP) are consistent with the household 2+0+0. In 2005, outlying values represented the transition of the child benefit from the second range in the amount of 538 CZK for 1 child up to the third range in the amount of 269 CZK for 1 child. Loss of child benefit occurred at 42% level of the average gross wage when the METR(EP) index reached value 3. In 2008, child benefit was 610 CZK for 1 child. In 2008, the outlying value represented a loss of the benefit at 18% level of average gross wages and amounted to 5.8. Reduction of child benefit or its complete termination points out the only moment when did not pay off to work to the observed household. This type of household shares similarities with the previous households and does not again experience a problem of demotivation, because it cannot claim social benefits except the aforementioned child benefit. Each government should give priority to this type of household, but not only in the means of financial support. For a state is it the most convenient type of household in the both short and long run. Expenditures on this household are the lowest and incomes are the highest. There are additional effects such as: higher birth rate; future generations acquire good economic patterns; the government has guaranteed income to the state budget and not the expenditure of it in resemblance of social benefit. The most economical variant of the household is in a situation where both adults are working and both reach 100% of average gross wages. A situation where one member is more than a year without work should not occur. Governments should be interested to know why this situation actually occurred, if it occurred. This type of a household is typical among the middle and upper middle class. The fact that it is not affected by social benefits, the household income is threatened only by the tax in the form of direct and indirect taxes. Therefore, social policy of both left and right wing governments does not significantly affect this particular household and METR(EP) in both cases produce very similar values even when the social policy changes.

5.   Conclusion

It is difficult to assess which social system is more suitable. A large influence has also state of the real economy and use of the social system. A low-budget social system that is constructed to save money from the state budget, used in a bad economic situation, can bring quite the opposite effect. The year 2008 was affected by financial crisis. Despite this circumstances ruling politicians have to deal with the problem in a particular situation and be able to adapt their policy to contemporary conditions. In the Czech Republic long-term unemployment represents more than 66% of the total unemployed population. These people usually belong to the secondary labour market and may have only acquired elementary education and so it is very difficult for them to find a better paid job. Their earnings are very low (often at the minimum wage level). Improvement of their situation in seems to them quite remote.

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The social system of left-wing government (in 2005) was for the household types 1+0+0 and 1+1+0 economically more motivating to find a job. Therefore government saved money in payment of social benefits. The right-wing government (in 2008) witnessed this phenomenon in the social system of household types 2+0+0 and 2+2. Right-wing government saved more money from unpaid social benefits in these types of households. Neither of these types rely more on the social system as the household type 1+1+2. This problem has not been resolved by either of the governments. Year 2008 was slightly better, unfortunately negligibly. It is necessary to change the situation of this type of household because it represents long-term problem for the Czech Republic with regard to the inherited unemployment.

Cannot be decidedly said which the social system - left-wing or right wing - is set up in a way that people are motivated to find a new job. The social system has to compel people to find a job, because the individual can regain work habits and then it can find a better paid job. If the individual would receive social benefits and there would not be a significant difference between the amount of social benefits and earnings, therefore people will not be enough motivated to be employed.

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SMEs' PROCESS MANAGEMENT DIFFERENCES WITHIN VARIOUS BUSINESS SECTORS

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Abstract. World economy is continuously driven by changes that influenced also small and medium sized enterprises management. These business types represent the vast majority of economy all over the world and simultaneously, are the fundamental driving force for European Union economy. The current business trend is to be focused on planning and monitoring so called process management. The systematic approach is to make an organization's workflow more effective, more efficient and more capable of adapting to a variable and unstable environment. The aim of the paper is to analytically describe process management in practice of small and medium sized enterprises in South Bohemia region in the Czech Republic within various business sectors. On the examined sample was performed quantitative-qualitative research funded by grant project GAJU 068/2010/S. The obtained data were statistically analysed within core business sectors. Furthermore, based on results were suggested certain advices for more effective process management.

Keywords: small and medium sized enterprises, process management, business sectors, effectivity.

JEL Classification: L53, O32.

1. Introduction

There is no doubt that small and medium sized enterprises are currently driving the whole European economy. They are Europe and domestic largest employer and their prosperity is the main source of crisis-torn European economies recovery. The current trend in today changing global environment is systematically going to managing processes. The vast majority of organizations are already using some elements of process management. Small and medium sized enterprises that will not in the near future change in a process driven organization will be the exception rather than the rule. Economy is entering a period in which the processes will clearly dominate in the world of managing organizations (Hammer in Šmída, 2007; Vodáček and Vodáčková, 2004).

Process approach in managing organizations connects individual activities into completely closed and logical sequences; in other words, into the processes. In the management literature can be found various classifications of business processes, but there is one of them which can be universally implemented in the management of each small and medium sized enterprise. The importance of this classification is that it comes directly from the primary focus of the organization. Based on this classification, there are two kinds of processes; core processes and supporting processes (Fig. 1). Core process can be defined as a key representative and architect of the organization's main business area. According to important authors, core processes include mainly production, providing services, sales and marketing, financial management, human resource management and logistics. Common characteristic of all core processes is that they take place throughout the whole organization. On the other hand, the main aim of the supporting processes is to directly support key core processes. While the core processes are typically specific to each small or medium sized enterprise, based on its unique products or services, supporting processes are focused more generally. Supporting processes are targeted on providing products and services to the customers. If necessary, these processes can be outsourced (Becker at al., 2003; Řepa, 2012; Dědina and Odcházel, 2007; Šmída, 2007).
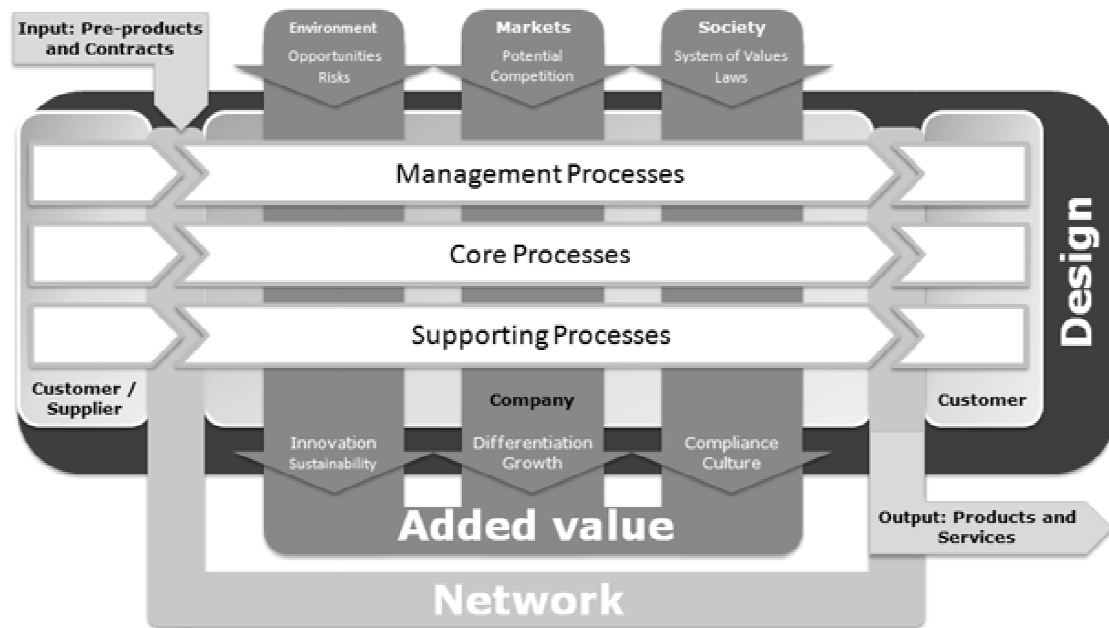
Fig. 1. Process management basic model (Source: Braincourt GmbH, 2012).

Burlton (2001) compares processes to the knowledge economy 'production lines'. They are becoming important and valuable assets for small and medium sized enterprises, as well as human resources, technology or information. Only those process driven organizations, according to Carr and Johansson (1995), can soon find the way how to make all activities and operations more efficient.

Smith and Fingar (2006) believe that small and medium sized enterprises, which have the ability to manage their business processes, are able to satisfy their customers better and faster than other organizations that are still driven by function based management. To the customer they offer higher quality products or services, they can flexibly and quickly react to economic environment changes. Despite the complexity of its implementation is process management a today critical need. According to Bennis (1997), organizations in the 21st century will survive only if they go through a self-renewal process. They have to increase their competitiveness and flexibly respond to the customers' demands. The key factor of enterprises successful future is just a transition to a process driven organization.

2. Methodology

The aim of the paper is to analytically describe the process management within small and medium sized enterprises (SMEs) in terms of key processes, sub processes, indicators and their characteristics based on the differences between various business sectors in which the enterprises operate.

The presented results were obtained during the grant project GAJU 068/2010/S; within its framework was accomplished research (September 2010 – April 2011) by quantitative-qualitative method of questionnaire survey complemented by depth interviews in total 187 SMEs within different business sectors in South Bohemian region and adjacent areas. There were used simplified classification of business sectors: construction (28%) and production (48%) within secondary sector of economy (76%), furthermore, trade (12%) and service (12%) within tertiary sector of economy.

The structured questionnaire evaluates basic data dealing with process management in the surveyed enterprises. The key part brings the results presented in this paper, key processes, sub processes, indicators and their characteristics. Indicators were characterized through a five-grade scale of frequency of detection, current state, trend and significance for the enterprise. The obtained data were statistically processed and analyzed in Microsoft Excel 2010. The main part of results is

based on comparison of relative frequencies within observed indicators and their characteristics with regard to the business sector in which the enterprise operates.

Although, there were found more processes, sub processes and indicators, this paper is focused on four key processes; Marketing & Business, Production, Human Resource Management and Finance and theirs key sub processes and indicators.

3. Process management of SMEs within different business sectors

3.1 Marketing & Business process

First process is represented a combination of two usually separate processes of marketing and business. Small and medium sized enterprises do not usually have resources required to manage these processes separately. Similarly, we can say that small and medium sized enterprises are not such keen on marketing and such activities are processed on more informal level. Based on finding from praxes we have analysed these two processes as one.

Within this process there were found out three main sub processes; market analysis, product sales, customers communication. Table 1 shows five main indicators (in total were analysed 23 indicators) within mentioned sub processes according to the different business sectors. Most of indicators are monitored continuously, although, within the sub process product sales are the indicators monitored monthly. Enterprises mostly perceive current value of indicators in this process as average to very good. The trend of indicators is increasing except a few cases where the trend is stagnating.

As we can see in Fig. 2, the most important indicators are customer satisfaction (followed by 60% to 80% of enterprises), apart from business sector trade, where is most important indicator competition (followed by 86% of enterprises). These indicators are mostly monitored continuously and enterprises perceived their current value as average.

Table 1. Key indicators of Marketing & Business process monitored within sub processes in surveyed SMEs according to their business sector affiliation (relative frequency).

Sub process	Market analysis		Product sales		Customers communication			
Indicator	Competition	Customers	Volume of sales	Price policy	Customer satisfaction	Customer needs	Complaints	Advertising
Construction	79%	86%	-	59%	81%	65%	-	-
Production	56%	55%	55%	-	58%	-	50%	-
Trade	86%	-	74%	82%	74%	69%	-	-
Service	65%	65%	-	-	69%	61%	-	52%

Source: own creation.

Fig. 2. Key indicators of Marketing & Business process monitored within sub processes in surveyed SMEs according to their business sector affiliation (Source: own creation).

3.2 Production process

Process of production builds on wide range of sub processes. The most important are shown in Table 2; supplier communication, production and service, storage, transport, maintenance. Fig. 3 shows that there is one strong sub process and a lot of small ones. There were analysed in total 24 indicators, the key of them are shown in the Table 2 and also in the Fig. 3. Indicators are also most often monitored continuously, apart from the sub process of storage where are indicators monitored usually monthly. Enterprises are satisfied with results of these indicators too. The construction sector predominantly shows increasing trend, overleaf stagnation is apparent within production sector.

It is obvious that the higher importance has the sub process supplier communication. Most important indicator within this sub process is material costs which is most followed indicator for enterprises in construction, production and trade sector. Enterprises involved in services are mostly oriented on indicator supplier selection.

Table 2. Key indicators of Production process monitored within sub processes in surveyed SMEs according to their business sector affiliation (relative frequency).

Sub process	Supplier communication					Production and service	Storage	Transport	Maintenance
Indicator	Supplier selection	Supplier evaluation	Quality of supply	Speed of delivery	Material costs	Calculation of product costs	Value of stock	Transport costs	Maintenance costs
Construction	60%	-	67%	-	75%	62%	-	62%	-
Production	59%	-	-	50%	65%	62%	-	-	58%
Trade	67%	67%	81%	76%	81%	-	-	-	-
Service	59%	36%	36%	36%	-	-	50%	-	-

Source: own creation.
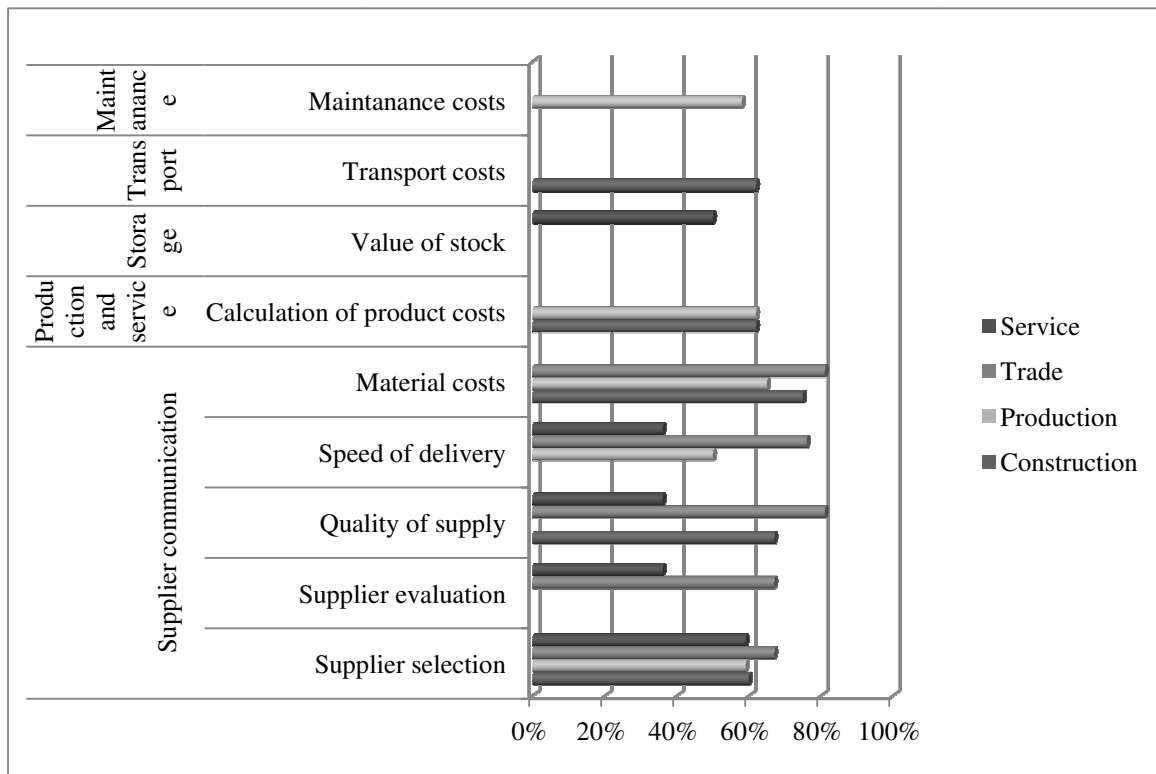
Fig. 3. Key indicators of Production process monitored within sub processes in surveyed SMEs according to their business sector affiliation (Source: own creation).

3.3 Human Resource Management process

Human Resource Management replaced and extended term Personal process a few decades ago. Currently it represents one of the key parts of process management because it is essential part of the rest of processes. In the table 3 we can see three main sub processes; recruitment, employee evaluation and training and education. Overall there were examined 10 indicators and the most important are also visible in the Fig. 4.

The most important sub process for all sectors is the process of employee evaluation. One significant exception represents enterprises involved in service for which is very important sub process training and education. Compared with previous processes is more apparent stagnation within indicators in production sector and also in trade sector, on the other hand their current value is overall perceived as good. Enterprises involved in construction and service stated mostly increasing trend in these process.

It is obvious from Table 3 that most important indicator is labour production especially within construction where is followed by 81% of enterprises. Its current state is satisfied and trend is increasing. Another important indicator is working time use and employee satisfaction especially in trade oriented enterprises where are followed by more than 90 %. On the other hand it is quite curious that enterprises in this sector are not such interested in recruitment. Enterprises in the service sector are typical by high orientation on training and education in the point of view of the qualification growth.

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Table 3. Key indicators of Human Resource Management process monitored within sub processes in surveyed SMEs according to their business sector affiliation (relative frequency).

Sub process	Recruitment	Employee evaluation					Training and education
Indicator	Selection	Sickness	Accidents	Labour productivity	Working time use	Employees satisfaction	Qualification growth
Construction	71%	-	44%	81%	58%	-	42%
Production	74%	63%	60%	76%	-	60%	-
Trade	-	72%	72%	72%	94%	83%	-
Service	76%	-	-	67%	67%	57%	81%

Source: own creation.
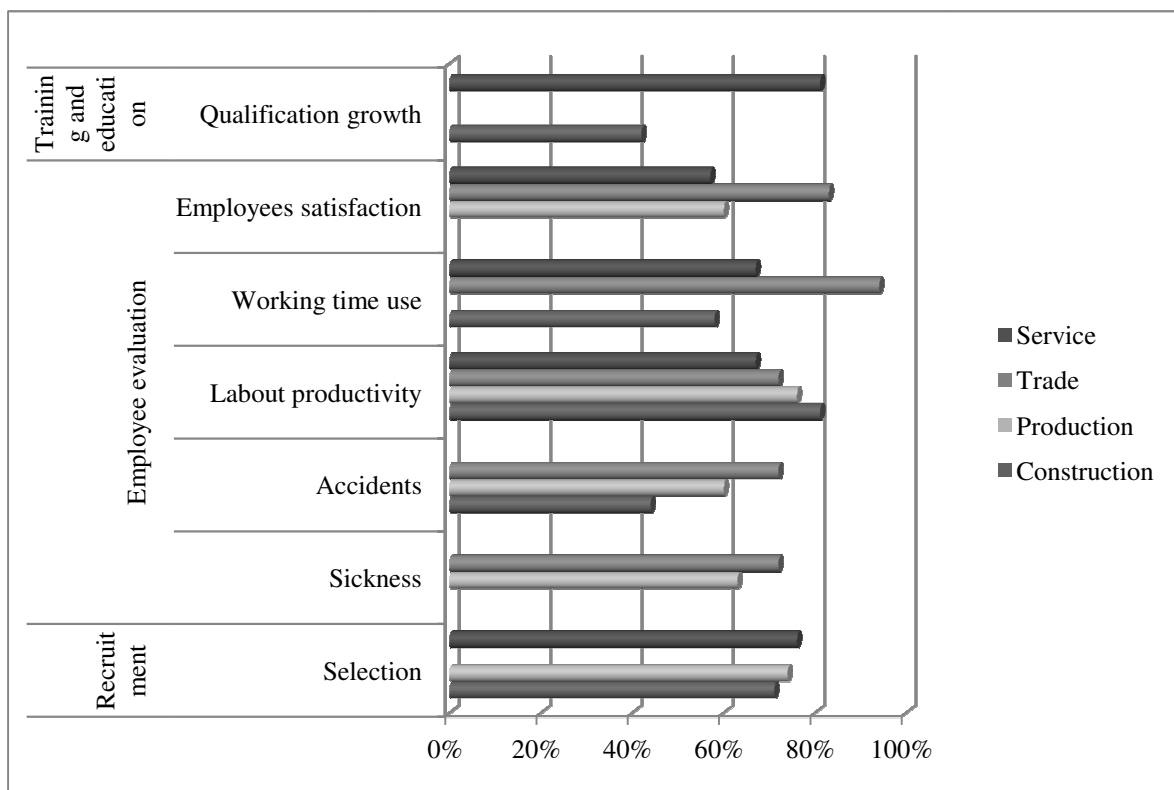
Fig. 4. Key indicators of Human Resource Management process monitored within sub processes in surveyed SMEs according to their business sector affiliation (Source: own creation).

3.4 Financial process

The last but for sure not the least is the process of finance. It is quite logical that this process attracts the most attention. Even though there are currently a lot of different path to profit and we have for example mentioned growing importance of human resource management, money are still the centrepiece of all business and therefore it is given more attention to them.

There were analysed overall six sub processes with 32 indicators, the most important are shown in the Table 4 and the comparison is more visible graphically in the Fig. 5. Compared with previous indicators in this process are monitored most often monthly or weekly. Enterprises stated that current value of indicators in this process is mostly good and the trend is increasing except the enterprises involved in production. Financial planning is typical for construction companies. The factor which is common for all companies is importance of indicators in the sub process financial management

especially profit, sales and cost control. These indicators are carefully followed by vast majority of examined enterprises.

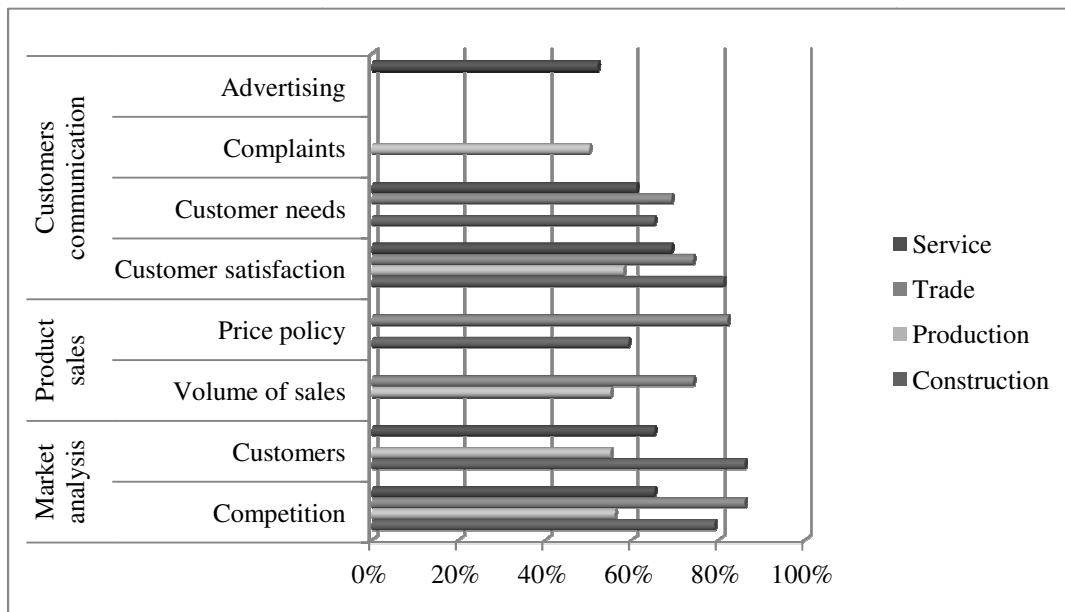**Table 4.** Key indicators of Financial process monitored within sub processes in surveyed SMEs according to their business sector affiliation (relative frequency).

Sub process	Financial planning	Financial management				Revenue and expense management	
Indicator	Plans creation	Profit	Cash flow	Sales	Cost control	Labour costs	Energy costs
Construction	55%	96%	57%	84%	76%	-	-
Production	-	93%	64%	84%	74%	59%	-
Trade	-	100%	-	95%	82%	68%	64%
Service	-	91%	59%	86%	73%	54%	-

Source: own creation.
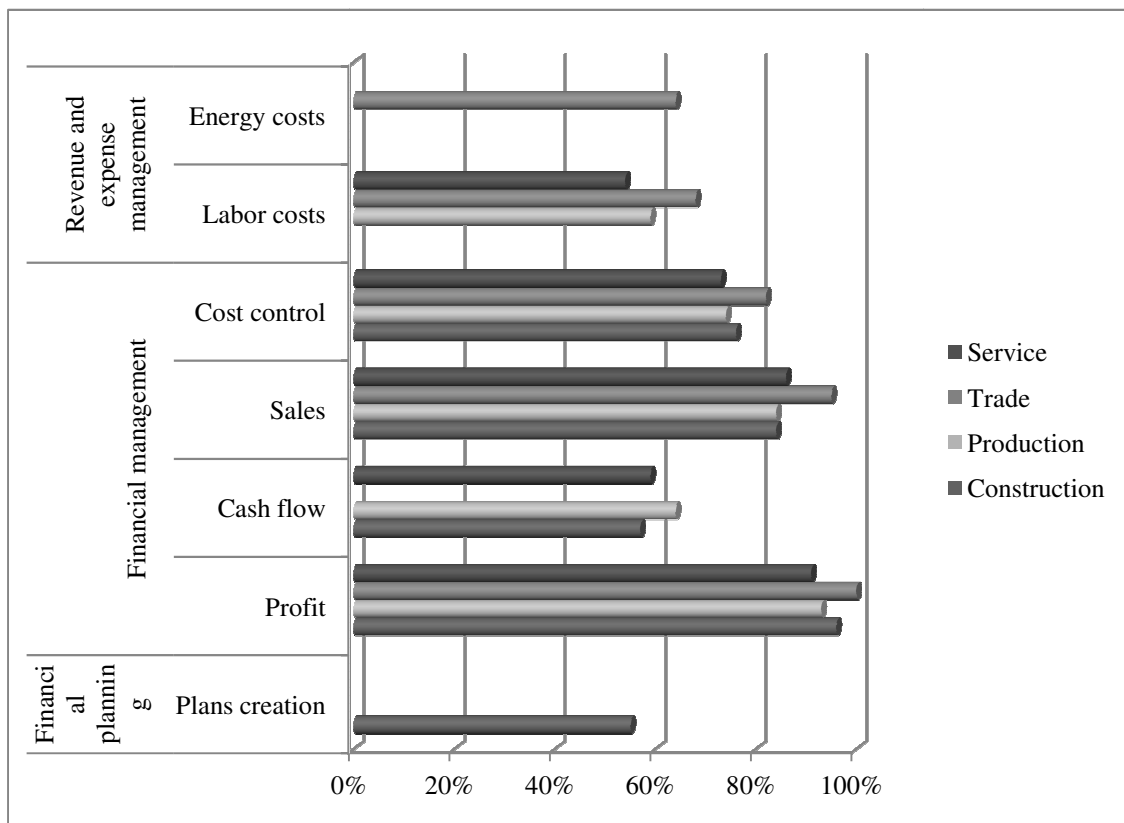
Fig. 5. Key indicators of Financial process monitored within sub processes in surveyed SMEs according to their business sector affiliation (Source: own creation).

4. Design of process management model for SMEs

Based on the findings presented in the charter 3 there were designed process management model for SMEs of key processes and sub processes. The model is focused on core processes because of, as was mentioned in the introduction, specific processes are often more individual and it is difficult to present them on the general level.

The proposed model of process management (Fig. 6) contains of four key processes; marketing and business, production, human resource management and financial. Within each process there are

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a lot of possible sub processes. The model shows the key ones; for the marketing and business process there are sub processes customer communication, market analysis, product sales; for the production process there is sub process supplier communication; for the human resource management process there are sub processes employee evaluation, recruitment, training and education; and for the financial process there are sub processes financial management, revenue and expense management, financial planning.

SMEs should be focused on these processes and sub processes in the meaning of specific and detailed description of these problematic within its business, to set appropriate objectives, strategies and most of all to set adequate measurement tools and overall controlling system. Useful indicators and its characteristics were already outlined in the previous chapter 3. Enterprises should be focused on these parts of its process management to use more of its possible advantages and so to create more valuable and sustainable business.
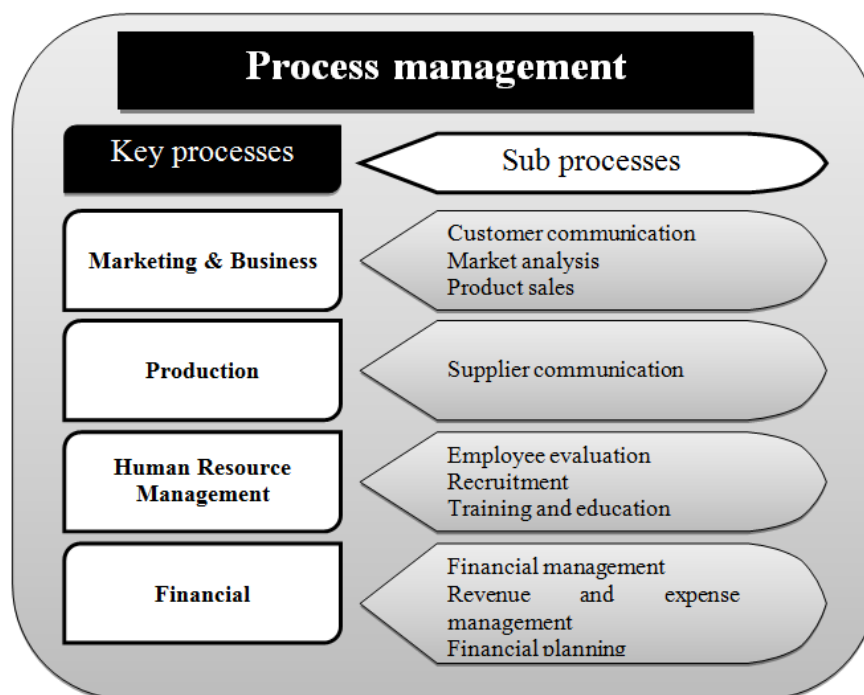
Fig. 6. Design of process management model for SMEs (Source: own creation).

5. Conclusion

The aim of this paper was to analytically describe the process management within small and medium sized enterprises in terms of key processes, sub processes, indicators and their characteristics based on the differences between various business sectors in which the enterprises operate. There were find out four main processes; marketing and business, production, human resource management and financial. Within these processes were pointed out key sub processes with most important indicators and theirs characteristics with regards to differences between business sectors of construction, production, trade and service.

In conclusion, it is appropriate to summarize that the most important process is financial followed by production, human resource management and marketing and business. The process of marketing and business is most advanced and exploited in the sector of trade followed by construction, service and production. In the process of production there is the same order, which is quite curious because enterprises involved in production sector have less advanced this process in comparison to enterprises in other sectors. Human resource management process is most advanced and used in the sector of

trade followed by construction. Enterprises from trade area has also dominant position in the financial process, where are followed by enterprises operating in production, construction and service.

Process management is overall most advanced within enterprises involved in trade followed by enterprises operate is construction, production and service. It is important to point out that the difference between process management in trade enterprise and enterprise offering services is very significant. This research will continue in more detailed analysis and proposed model.

6. Acknowledgement

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ECONOMETRIC MODELLING AND FORECAST OF ORADEA MUNICIPALITY'S LOCAL REVENUES

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Abstract. Planning local budgets has gained a major importance with the start of the decentralization process. Although each EU member state is free to develop its own local tax policy, there is a common European approach established by the "European Charter of Local Self-Government", signed in Strasbourg on October 15, 1985. Thus, Article 3 of the Charter proposes that local authorities have the right to regulate and manage an important part of public issues and Article 9 presents some general principles on the financial resources of local authorities. Regarding the quantity and evolution of local revenues, the European Commission considers that these are particularly important in public management because, in their absence, local governments cannot implement any public policy thus jeopardizing local economic development. Given this, the paper tackles the subject of estimating the local budget revenues, aiming to identify a viable econometric model for forecasting Oradea municipality's local public revenues.

Keywords: local revenues, econometric modelling, forecast.

JEL Classification: C22, H20, H71, O18.

1. Introduction

Local government plays a central role in the economic development of a locality. It can stimulate and influence local economic development indirectly, by creating the necessary framework for development of local businesses and providing incentives to attract foreign investors, and also directly by their own investments which lead to improving the lives of citizens.

Local revenues are those that give government financial strength to contribute to local development and their incorrect forecasting endanger development policies on short and medium term promoted by the public authority. It is therefore particularly important to identify a model of forecasting the local government revenue to provide results which are closer to reality.

According to Article 5, paragraph (1) of the Romanian Law 273/2006 on local public finances, updated, local revenues are made up of own revenues, consisting of: taxes, fees, contributions and other payments, other income and allowances deducted from income tax, from amounts deducted from certain state taxes, subsidies from the state budget and other budgets, as well as donations and sponsorships.

Substantiation and forecasting revenues of local budgets is normally based on the finding and evaluating taxable material and tax base according to which are calculated the taxes and fees for evaluation services and revenues from these and other specific elements. In this paper we propose the use of econometric models to estimate the local budget revenues. Models are applied to the local budget of Oradea in Romania for five major categories of local revenue, namely shares deducted from income tax, property taxes and revenues, amounts deducted from VAT, property income, income from asset and grants from the state budget and other authorities. Forecasts obtained by using the econometric model were finally compared with values recorded in the local budget.

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2. Literature review

Much of the literature dealing with the financial substantiation of local budgets in general, and income in this case, focused primarily on evaluating various forecasting techniques to identify those with highest precision. Obviously there are specialists that have studied besides this issue the place of forecast revenues into the budget process (and giving it the role of starting point in the budget process, which is determined based on future spending levels), participation in forecasts of revenues (Sun and Lynch, 2008), and also the duration for which the forecasts are made (Ingraham, 2007, p. 44).

Gianakis and McCue (1999) proposed as a method for estimating local budgets extrapolation (simple regression), through which analysts are able to summarize the trends of previous years and expand them in future. This could use the Box-Jenkins technique, analyzing therefore a large and correct database. In addition to studying the dynamics in the past, analysts can also use multiple regression models, thus taking into account other determinants of income.

Rabin (1992) gives a brief overview of the main methods used to substantiate the local budget, specifically to estimate its income. Among these he lists qualitative methods, trend analysis of time series, causal methods, multi-methodological forecast and econometric methods.

Qualitative methods are based on simple human reasoning and judgment and consist of forming a diverse group of specialists to issue opinions regarding expected revenue to be collected. Given the large amount of numerical data existing in terms of revenue, exclusive use of qualitative methods can result in incorrect estimates.

Trend analysis of time series has the feature of enabling professionals to predict future revenues based on historical data held. According to Box and Jenkins (1976 cited in Rabin, 1992), time series methodology is of three types: moving average, auto-regression and mixed techniques. Time series methods are based on the assumption that past conditions will be preserved also for the forecast period, thus not taking into account any economic changes that could occur.

Causal methods, unlike methods of time series are not based on analysis of historical values of one variable, but on the historical inter- correlations of several variables (determinants of taxes or tax base). Since it is necessary to establish a very large data bases (historical values of several variables), this method can be costly.

Multi-method forecast involves multi-use of several estimation methods: qualitative, time series and causal for determining the future value of income categories. According to Spyros Makridakis (1987 cited in Rabin, 1992), combining several prediction methods will determine an increase of its accuracy. Because the economy is in a constant change, the combination of several estimation methods can help identify those changes that occur and their quantification in order to achieve accurate forecasts. The interesting thing to analyze in the use of multiple forecasting methods is that its results may vary. Moreover, even if the same model is used by several professionals, they can obtain different estimated values. This is because the assumptions on which the model is generally built differ from one specialist to another, just as differ the reasonable adjustments that they try to incorporate in the model (Golembievski and Rabin, 1997).

Econometric methods are based on Dutch economist Jan Tinbergen who, for the first time in history, has developed a series of equations to represent and model the functioning of the Dutch economy. These have been used at a very impressive and increasing scale. However, their application requires specialists and local governments suffer from their absence. We thus find where we have very good methods of forecasting revenues of local budgets, but they can not be used or are misused due to lack of staff trained in statistics and econometrics. Bright side is that specialty literature shows that simple forecasting models may have a higher degree of accuracy, perhaps equal to that of more complex models (Cirincione et al., 1999 quoted in the Sun and Lynch, 2008). But it must be considered also the type of forecast revenue, local government having the capacity to make a more accurate forecast of revenues from property taxes, for example, than of revenues from the state budget.

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Also, to obtain relevant estimates of local budget is necessary to analyze historical values over a period of 10-15 years (Spearman, 2007), which is difficult in local government of Romania, where such a comprehensive budget monographs are generally lacking

Shah (2007) presents also different forecasting techniques, including rational techniques, time series techniques, deterministic techniques and statistical models. Although the terminology differs, they are basically those presented above, according to Rabin (1992).

In conclusion, there are numerous techniques for substantiating central and local budgets and as such, specialists in public administration must be careful when choosing models for substantiation, and also exogenous factors taken into account, any budgetary measure being very sensitive to the chosen model for its estimation (Blinder, 1974). Budget revisions, although a solution to a less accurate forecast of the budget, may jeopardize the financing of investment objectives on medium and long term.

3.   Methodology and econometrics models

In time series analysis, the Box–Jenkins methodology, named after the statisticians Box and Jenkins, is the most popular model, applies autoregressive moving average ARMA or ARIMA models to find the best fit of a time series to past values of this time series, in order to make forecasts.

Box and Jenkins propose an entire family of models, called ARIMA models, that seems applicable to a wide variety of situations. They developed a practical procedure for choosing an appropriate ARIMA model out of this family of ARIMA models. Selecting an appropriate ARIMA model may not be easy (Pankratz, 1983).

The Box-Jenkins procedure consists in the crossing of several stages for the identification of the most appropriate autoregressive model of analysis of a time series. Box and Jenkins propose a practical three primary stage procedure for finding a good model: Stage 1- Identifying the model -, Stage 2 - Estimating the model - and Stage 3 - Diagnostic model check (Box, Jenkins and Reinsel, 1994).

The model identification stage (stage 1) is the most important one, because it identifies an appropriate model from the ARIMA family, which may be used to represent a given time series. At this stage, graphics are used to measure the correlation between the observations within a single data series, autocorrelation function (ACF) and partial autocorrelation function (PACF). This is how the estimated ACF and PACF are used to establish if the series is stationary or not (Pankratz, 1983).

Traditional methods of time-series analysis are mainly concerned with decomposing the variation in a series into components representing trend, seasonal variation and other cyclic changes. Any remaining variation is attributed to 'irregular' fluctuations. This approach is not always the best but is particularly valuable when the variation is dominated by trend and seasonality (Chatfield, 2004).

The purpose of the model identification stage, is to detect seasonality, if it exists, and to identify the order for the seasonal autoregressive and seasonal moving average terms. For many series, the period is known and a single seasonality term is sufficient. For Box–Jenkins models, one does not explicitly remove seasonality before fitting the model. It may be helpful to apply a seasonal difference to the data and regenerate the autocorrelation and partial autocorrelation plots. In some cases, the seasonal differencing may remove most or all of the seasonality effect.

Stationary realizations are generated by stationary processes. If the random shocks in a process are normally distributed, then the process will be stationary if the mean, variance and autocorrelation structure are constant through time (Pankratz, 1983). Usually, in economy, time series are not stationary. A nonstationary series can be made stationary with appropiate transformations. In time series analysis, the most commonly under transformation are variance stabilizing transformations and differencing, which is also particularly useful for removing a trend. To find whether a series is stationary are nonstationary the Dickey-Fuller test can also be used.

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In practice, in order to test the unit root of a stochastic process Y_t, the following equation should be considered:

$$\Delta y_t = \delta y_{t-1} + u_t \qquad (1)$$

If the null hypothesis $H_0 : \delta = 1$ is true, then a unit root is obtained, which indicates that the time series under consideration is nonstationary. Dickey and Fuller have computed the critical values of the t-statistic on the basis of Monte Carlo simulations. This t-statistic or test is known as the Dickey–Fuller (DF) test, which does not follow the usual t-distribution.

The null hypothesis is $H_0 : \delta = 1$, which indicates that there is a unit root or the time series is nonstationary. The alternative hypothesis is $H_1 : \delta < 1$, which indicates that the time series is stationary. Therefore, if the null hypothesis is rejected, it means that Yt is a stationary time series.

Once stationary and seasonality have been addressed, the next step is to identify the order of the autoregressive(p) and moving average(q) terms. A strong duality exists between the AR and the MA model in terms of their autocorrelation functions and partial autocorrelation functions. To identify an appropriate ARIMA model, minimum of n=50 observations are needed, and the number of sample lag-k autocorrelations and partial autocorrelations to be calculated should be about n/4 (Wei, 2006).

At the estimation stage (stage 2) the coefficient values must be chosen according to some criterion. Box and Jenkins favor estimates chosen according to the maximum likelihood criterion. Mathematical statisticians frequently prefer the maximum likelihood approach to estimation problems because the resulting estimates often have attractive statistical properties. It can be shown that the likelihood function (of a correct ARIMA model) from which maximum likelihood estimates, are derived reflects all useful information about the parameters contained in the data. Finding exact maximum likelihood estimates of ARIMA models can be difficult and may require relatively large amounts of computer time. For this reason, Box and Jenkins suggest using the least-squares criterion. It can be shown that if the random shocks are normally distributed then Least squares estimates are either exactly or very nearly maximum likelihood estimates. "Least squares" refers to parameter estimates associated with the smallest sum of squared residuals. To explain this idea we first show what is meant by the term residuals. Then we illustrate the calculation of the sum of squared residuals. Finally, we consider how we can find the smallest sum of squared residuals (Pankratz, 1983).

Once we have obtained precise estimates of the coefficients in an ARIMA model, we come to the third stage in the Box-Jenkins procedure, diagnostic checking.

This stage shows whether the estimated model is the adequate one. We have two possibilities. If diagnostic checking shows a model to be inadequate from a statistical point of view, we have to return to the identification stage in order to select other models. If diagnostic checking shows a model to be adequate, we can apply the forecasting for that model.

The most important tests of the statistical adequacy of an ARIMA model involves the assumption that the random shocks, or random walk, are independent, and normally distributed. At the diagnostic checking stage, the residuals can be used to test the hypothesis about the independence and the normal distribution of the random shocks.

If the Box-Jenkins model is good for the data series, the residuals will satisfy these assumptions. If these assumptions are not satisfied, we need to go back to the model identification step and try to find a better model. Another way to assess if the residual from the Box-Jenkins model follow the assumptions is to generate statistical graphics, including an autocorrelation plot, of the individuals (Pankratz, 1983).

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4. Analysis of data series on the shares deducted from global income tax

In accordance with the stage presented above the analysis of data series on the shares deducted from the income tax (CDIV) is a starting point for testing seasonality by a graphic representation.
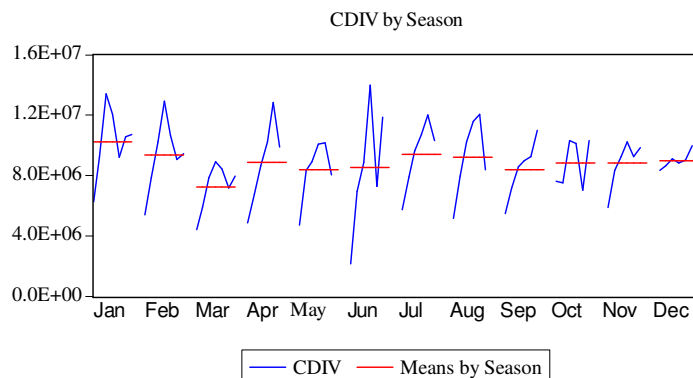
Fig. 1. Evolution of shares deducted from global income tax recorded by the city of Oradea in January 2006-March 2012 (Source: author's calculation).

The chart shows that the series is affected by seasonality. High values registered by shares deducted from property tax in Oradea recorded in January are mainly due to incentives and awards received by employees with the occasion of holidays. Note that the lowest value of this series is recorded in the March months analyzed in this period. To determine whether the deseasonalized series of shares deducted from global income tax (CDIV_SA) is stationary, we can use different tests. One of these is the ADF test (Augmented Dickey Fuller). In our case ADF_{calc} value is -2.32 and the value table, read for the probability of 95% is -2.90. Note that the absolute value ADF_{calc} is less than the table, so the deseasonalized series of shares deducted from the income tax is not stationary.

Table 1. Time series model of shares deducted from global income tax.

Dependent variable: shares deducted from global income tax- deseasonalized - CDIV_SA		
Stationarity– ADF test	ADF_{calc}	-2,32
ADF test – diferentiated serie of order 1	ADF_{calc}	-8,17*
Identifying the model - correlogram		ARIMA (2,1,0)
Testing the significance of parameters (Student test)	AR(1)	-0.563081 (-4.999933) *
	AR(2)	-0.341917 (-3.036236)*
R-squared		0.270423*
Breusch – Godfrey LM – independence of errors	LM_{calc}	3.824936*
ARCH LM – homoscedasticity of errors	LM_{calc}	1,108497*
Jarque Bera – normality of errors	JB_{calc}	1.594307*

*, ** Significant at the 5%, 1% level. T-statistic in parentheses.
Source: author's calculation.

The most common way of stationing is differentiation of order 1 or higher, which involves the differences between values recorded in each period and previous period until the new series obtained is stationary. Since the deseasonalized series of shares deducted from income tax is not stationary, we will differentiate it, establishing the differences of order 1. Applying the ADF test again, it can be seen in Table 1 that the value ADF_{calc} = -8.17 in absolute value, is greater than the table, read for the probability of 95% equal to -2.90, so the series of shares deducted from tax deseasonalized and differentiated of order 1 (CDIVD_SA) is stationary.

To identify the orders p and q the characteristics of autocorrelation functions (ACF) and partial autocorrelation (PACF) are used. Since the initial deseasonalized series of shares deducted from income tax was not stationary, this becoming stationary after being differentiated by the order 1, the

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type of the appropriate model for this variable is the type ARIMA(p,d,q) with d = 1 . After testing several models of ARIMA type, it was found that the most representative type of model to study the evolution of property income is ARIMA(2,1,0).

$$CDIVD\_SA = c_1 CDIVD\_SA_{t-1} + c_2 CDIVD\_SA_{t-2} + \varepsilon_t \qquad (2)$$

The next step is to test the significance of each parameter of the series with the Student test. Student statistics values for both parameters are larger in absolute value than the table equal to 1.96 for a significance level of 5%, as can be seen in Table 1. Thus, we conclude that the null hypothesis H_0 is rejected for all time series parameters; they are significantly different from zero to the level of total population.

Testing the validity of the model ARIMA (2,1,0) requires independent analysis of the errors, of homoscedasticity and normality of errors.

In testing independence of errors we can start from the equation:

$$\varepsilon_t = \alpha_1 CDIVD\_SA_{t-1} + \alpha_2 CDIVD\_SA_{t-2} + \rho_1 \hat{\varepsilon}_{t-1} + \rho_2 \hat{\varepsilon}_{t-2} + \omega_t \qquad (3)$$

The following hypotheses are issued:

H_0: $\alpha_1 = \alpha_2 = \rho_1 = \rho_2 = 0$ - independent errors

H_1: $\alpha_1 \neq \alpha_2 \neq \rho_1 \neq \rho_2 \neq 0$ - dependent errors.

As $LM_{calc} = 3,82$ and $\chi^2_{tab(1;73)} = 3.84$ we are able to conclude that errors are independent and this is confirmed by the correlation value R-squared = 0.053124, a value very close to zero, that value *t - statistics*, which are all smaller in absolute value than 1.96, all coefficients being equal statistically to zero.

Regarding testing homoscedascity of errors, as $LM_{calc} = 1.108497$ and $\chi^2_{tab(1;73)} = 3.84$ it can be concluded that errors are homoscedastic, so the model is valid.

In testing the hypothesis of normality of errors because $JB_{calc} = 1.59 < \chi^2_{tab(\alpha;5)} = 9.21$ we can say that this can not be rejected in the total population, the errors being normally distributed.

Because all three hypotheses about the random variable were checked, it comes out that model ARIMA (2,1,0) is valid and can be used for making forecast.

Knowing that in March 2012 shares deducted from global income tax received by the municipality of Oradea were 7.950.679.9 lei, using the point estimate, from calculations performed using Eviews program, we concluded that if they would be influenced only by their development over time, their value in April 2012 would be 7.537.652 lei.

Another measure to estimate the dependent variable besides the point estimate is the confidence interval estimation. A graphical representation of the predictions by confidence intervals is shown in Fig. 2.

Fig. 2. Forecast of dependent variable – amounts deducted from global income tax (Source: author's calculation).

4.1 Analysis of data series on property taxes and fee

Just as with previous series, the seasonality of the series on taxes and property taxes will be tested through a graphic representation.
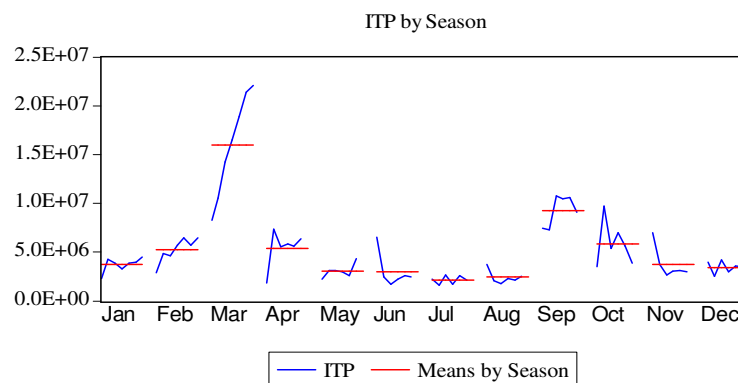
Fig. 3. Evolution of revenues from property taxes and fees received by Oradea Municipality during January 2006 – March 2012 (Source: author's calculation).

The chart shows that the series is affected by seasonality. High values recorded by the property taxes in March and September are given by the fact that these months represent maturity terms.

To determine whether deseasonalized series of taxes on proprietary (ITP_SA) is stationary we use, like for the above series, the ADF test.

Table 2. Time series model of amounts from property taxes and fees.

Dependent variable: amounts from property taxes and fees – deseasonalized – ITP_SA		
Stationarity– ADF test	ADF$_{calc}$	-5.820955*
Identifying the model – correlogram		ARMA (2,6)
	AR(1)	0.793519 (5.303808)*
	AR(2)	0.197870 (1.974276)*
	MA(1)	-0.407692 (-2.835588)*
	MA(2)	-0.209799 (-4.798370)*
Testing the significance of parameters	MA(3)	-0.131472 (-4.939033)*
	MA(4)	0.145920 (1.991872)*
	MA(5)	0.929556 (34.91924)*
	MA(6)	-0.451542 (-3.299697)*
R-squared		0.350551*
Breusch – Godfrey LM – independence of errors	LM$_{calc}$	5.273462**
ARCH LM – homoscedasticity of errors	LM$_{calc}$	9.030320**
Jarque Bera – normality of errors	JB$_{calc}$	0.265607*

*, ** Significant at the 5%, 1% level. T-statistic in parentheses.
Source: author's calculation.

In our case ADF$_{calc}$ value is -5.82 and the value table, read for the probability of 95% is -2.90. Note that the absolute value of ADF$_{calc}$ is greater than the table value, so the deseasonalized series of property taxes is stationary. Since the series is stationary the next step is to identify the type of model. Correlogram series shows that both ACF and PACF have positive and negative values that tend to equalize to zero. Since the two functions have similar characteristics we can not give a precise hypothesis on the most representative model type. A number of models AR(p), MA(q), ARMA(p,q) have been identified which can explain the dynamism of the series. Finally a model of type ARMA(2,6) was identified, as the most representative in the study of this data series. The ARMA(2,6) is:

$$ITP\_SA = c_1 ITP\_SA_{t-1} + c_2 ITP\_SA_{t-2} + c_3 \varepsilon_{t-1} + c_4 \varepsilon_{t-2} + c_5 \varepsilon_{t-3} + c_6 \varepsilon_{t-4} + c_7 \varepsilon_{t-5} + c_8 \varepsilon_{t-6} + \varepsilon_t \quad (4)$$

The next step is to test the significance of each parameter of the series with the Student test. Student statistics values for 8 parameters are presented in Table 2 and are larger in absolute value than the table equal to 1.96 for a significance level of 5%. Thus, we conclude that the null hypothesis H$_0$ is rejected for all time series parameters; they are significantly different from zero to the total population level.

Testing the validity of the model ARIMA(2,6) requires independent analysis of the errors, of homoscedasticity and normality of errors.

In testing independence of errors we can start from the equation:

$$\varepsilon_t = \alpha_1 ITP\_SA_{t-1} + \alpha_2 ITP\_SA_{t-2} + \rho_1 \hat{\varepsilon}_{t-1} + \rho_2 \hat{\varepsilon}_{t-2} + \rho_3 \hat{\varepsilon}_{t-3} + \rho_4 \hat{\varepsilon}_{t-4} + \rho_5 \hat{\varepsilon}_{t-5} + \rho_6 \hat{\varepsilon}_{t-6} + \omega_t \quad (5)$$

The following hipotheses are issued:

H$_0$: $\alpha_1 = \alpha_2 = \rho_1 = \rho_2 = \rho_3 = \rho_4 = \rho_5 = \rho_6 = 0$ - independent errors

H$_1$: $\alpha_1 \neq \alpha_2 \neq \rho_1 \neq \rho_2 \neq \rho_3 \neq \rho_4 \neq \rho_5 \neq \rho_6 \neq 0$ - dependent errors.

Since LM$_{calc}$ = 5,27 și $\chi^2_{tab(2;73)}$ = 9.21 we can conclude that errors are independent and this is confirmed by the values *t - statistic,* which are all smaller in absolute value than 1.96, all coefficients being statistically equal to zero.

Regarding testing homoscedasticity errors because $LM_{calc} = 9{,}03$ şi $\chi^2_{tab(2;73)} = 9.21$ we can conclude that errors are homoscedastic, so the model is valid.

In testing the hypothesis of normality of errors as $JB_{calc} = 0.26 < \chi^2_{tab(\alpha;5)} = 9.21$ we can say that it can not be rejected at the total population level, the errors being normally distributed.

Because all three hypotheses about the random variable were checked, that ARMA model (6) is valid, and thus can be used for making predictions.

Knowing that the property taxes and fees collected in February 2012 were 6,431,613 lei, and in May in March 2012 were 22,087,145 lei, using the point estimate, from calculations performed using Eviews program, it was concluded that if they would be influenced only by their development over time, their value in April 2012 would be 4.631.498 lei.

Another modality of estimating the dependent variable besides the point estimate is the confidence interval estimation. A graphical representations of the predictions by confidence intervals are shown in Fig. 4.
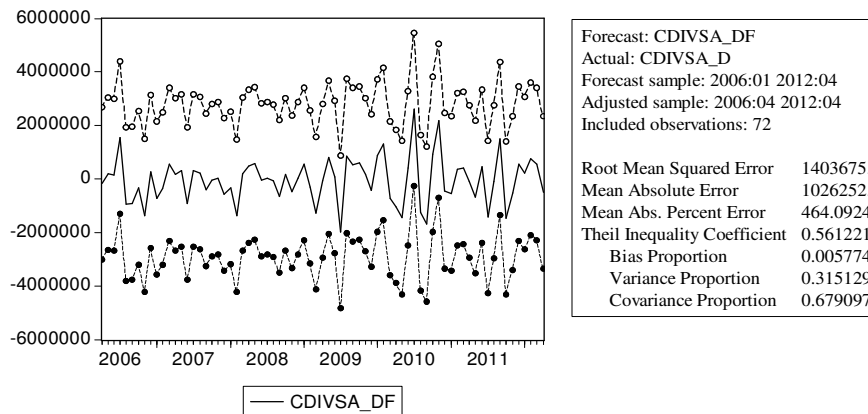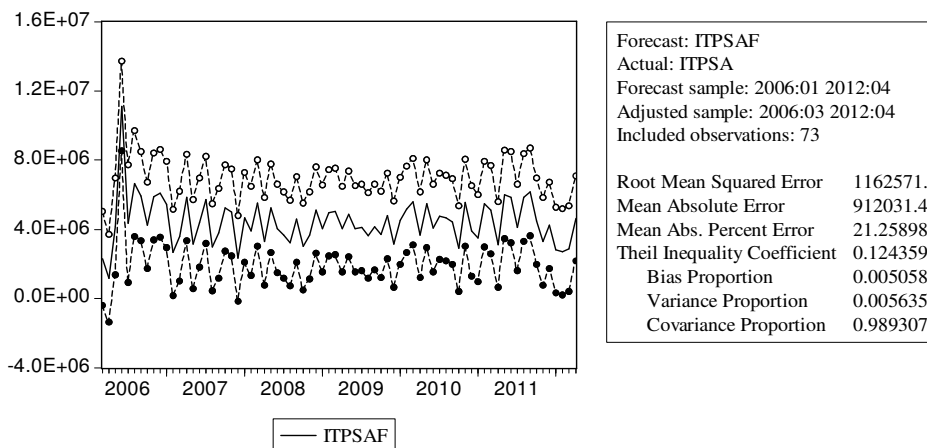

Fig. 4. Forecast of dependent variable – property taxes and fees – de- seasonalized (Source: author's calculation).

4.2 Analysis of data series on subsidies from the state budget and other administrative

Just as with previous series, the seasonality of the series on subsidies from the state budget and other administrations will be tested by graphical representation.
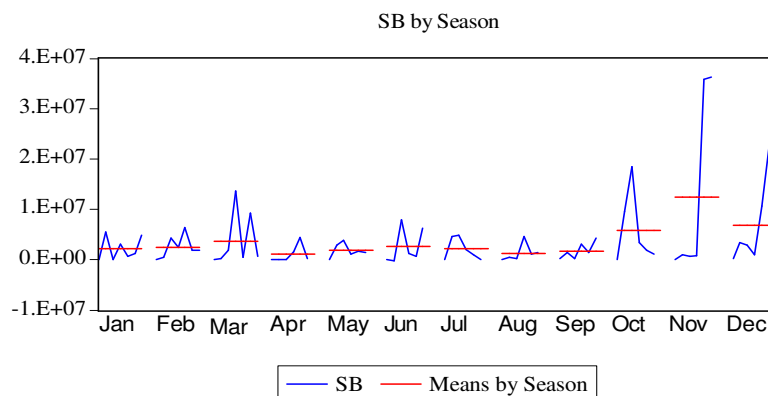
Fig. 5. Evolution of subsidies from the state budget and other administrations received by Oradea Municipality during January 2006 – March 2012 (Source: author's calculation).

The chart shows that the series is affected by seasonality. Maximum values of grants from the state budget and other administrations were recorded during November, for the period studied. This is because in November unspent funds are reallocated, so that they are not lost.

Also in this case to determine whether the deseasonalized series of subsidies from state budget and from other authorities (SB_SA) are stationary we use the ADF test (Augmented Dickey Fuller), whose results are presented in Table 3.

Table 3. Time series model of subsidies from state budget and other administrations.

Dependent variable:subsidies from state budget and other administrations – deseasonalized –SB_SA		
Stationarity – ADF test	ADF_{calc}	-2.206348
ADF test – differentiated series of order 1	ADF_{calc}	-6.679486*
Identifying the model - correlogram		ARIMA (0,1,2)
Testing the significance of parameters	MA(1)	-0.634793 (-5.617528)*
	MA(2)	-0.297773 (-2.579149)*
R-squared		0.378121*
Breusch – Godfrey LM – independence of errors	LM_{calc}	0.210824*
ARCH LM – homoscedasticity of errors	LM_{calc}	2.013251*
Jarque Bera – normality of errors	JB_{calc}	8.37010*

*, ** Significant at the 5%, 1% level. T-statistic in parentheses.
Source: author's calculation.

Because ADF_{calc} is -2.20 and the value table, read the for the probability of 95% is -2.90, we can see that the absolute value of ADFcalc is smaller than the table one, we can say that the deseasonalized series of grants from the state budget and other governments is not stationary.

Because the series is not stationary, we will differentiate it, leading to differences of order 1. Applying the ADF test again, we get the value ADFcalc = -6.68 in absolute value, higher than the table one, read for the 95% probability equal to -2.90, so the series of grants from the state budget and from other administrations, deseasonalized and differentiated of order 1 (SBD_SA) is stationary. The initial and deseasonalized series of grants from the state budget and from other authorities was not stationary, it becomes stationary after being differentiated by the order 1, the appropriate type of the model for this variable is the type ARIMA(p,d,q), with d = 1. After testing several models of ARIMA type, it was found that the most representative type of model to study the evolution of property income is ARIMA(0,1,2):

$$SBD\_SA = c_1\varepsilon_{t-1} + c_2\varepsilon_{t-2} + \varepsilon_t \qquad (6)$$

The next step is to test the significance of each parameter of the series with the Student test. Table 3 shows that Student statistics calculated values for the two parameters are larger in absolute value than the table equal to 1.96 for a significance level of 5%. Thus, we conclude that the null hypothesis H_0 is rejected for all time series parameters; they are significantly different from zero to the level of total population.

Testing the validity of the model ARIMA $(0,1,2)$ requires independent analysis of the errors, of homoscedasticity and normality of errors.

In testing independence of errors we can start from the equation

$$\varepsilon_t = \rho_1\hat{\varepsilon}_{t-1} + \rho_2\hat{\varepsilon}_{t-2} + \alpha_1\mu_{t-1} + \alpha_2\mu_{t-2} + \omega_t \qquad (7)$$

The following hypotheses are issued:

$H_0: \rho_1 = \rho_2 = \mu_1 = \mu_2 = 0$ - independent errors

$H_1: \rho_1 \neq \rho_2 \neq \mu_1 \neq \mu_2 \neq 0$ - dependent errors.

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As $LM_{calc} = 0,23$ și $\chi^2_{tab(1;73)} = 3.84$ we can conclude that the errors are independent. Regarding the testing of homoscedasticity of errors, as $LM_{calc} = 2,02$ și $\chi^2_{tab(1;73)} = 3.84$ we can conclude that the errors are homoscedastic, so the model is valid.

In testing the hypothesis of normality of errors as $JB_{calc} = 8.37 < \chi^2_{tab(\alpha;5)} = 9.21$ we can say that it can not be rejected at the level of the total population, the errors being normally distributed. Because all three hypotheses about the random variable were checked, results that model ARIMA (0,1,2) is valid, and thus can be used for making predictions.

Knowing that in March 2012 subsidies from state budget and other administrations received by Oradea were 672,689 lei, and using the point estimate, from calculations performed using Eviews program, we concluded that if they would be influenced only by their development over time, their value in April 2012 would be 1,786,084 lei. Another way of estimating the dependent variable besides the point estimate is the confidence interval estimation. A graphical representations of the predictions by confidence intervals are shown in Fig. 6.
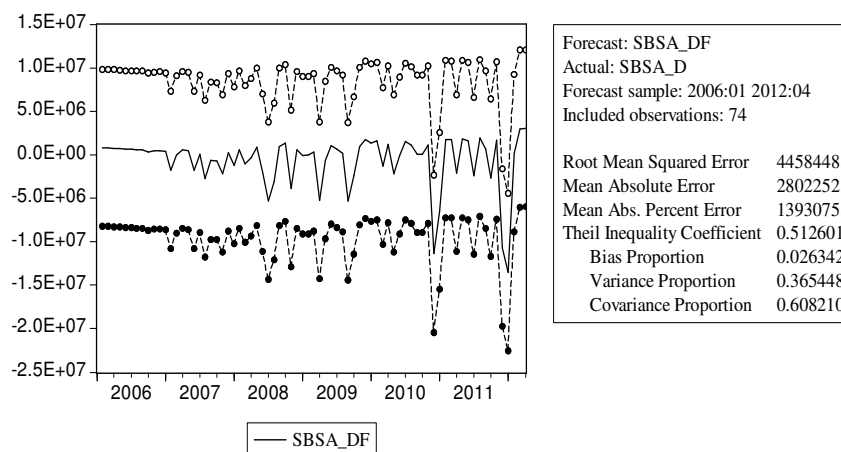
Fig. 6. Forecast of dependent variable – subsidies from state budget and other administrations – de- seasonal and diferentiated (Source: author's calculation).

4.3 Analysis of data series on amounts deducted from VAT

Just as with previous series, the seasonality of the series on amounts deducted from VAT will be tested by graphical representation in Fig. 7.
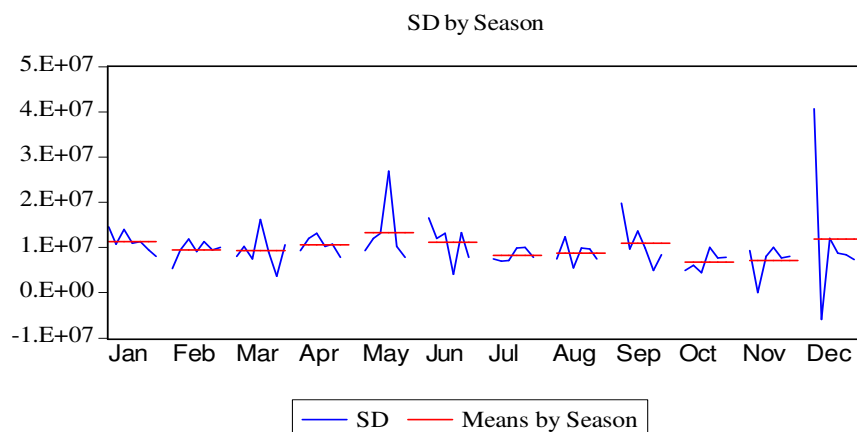
Fig. 7. Evolution of amounts deducted from VAT registered by Oradea Municipality during January 2006 – March 2012 (Source: author's calculation).

The chart shows that the series is not affected by seasonality, as the averages in the 12 months are almost the same. To determine whether the series amounts deducted from VAT (SD) is stationary different tests can be used. One of these is the ADF test (Augmented Dickey Fuller), whose results are presented in Table 4.

Table 4. Time series model of amounts deducted from VAT.

Dependent variable: amounts deducted from VAT - SD		
Stationarity– ADF test	ADF_{calc}	-4.026267*
Identifying the model - correlogram		MA(3)
	MA(1)	0.488203 (4.574173)*
Testing the significance of parameters	MA(2)	0.379901 (3.366959)*
	MA(3)	0.384620 (3.559567)*
R-squared		0.477600*
Breusch – Godfrey LM – independence of errors	LM_{calc}	0.000000*
ARCH LM – homoscedasticity of errors	LM_{calc}	0.109283*
Jarque Bera – normality of errors	JB_{calc}	6.57158**

*, ** Significant at the 5%, 1% level. T-statistic in parentheses.
Source: author's calculation.

Because ADF_{calc} value is -3.94 and the value table, read for the probability of 95% is -2.90, we see that ADF_{calc} in absolute value is greater than the table one, so the series of amounts deducted from VAT is stationary. Since the series is stationary next step is to identify the type of model. Starting with the autocorrelation function (ACF) and partial autocorrelation function (PACF), a number of models have been identified that can explain the dynamic series. Finally an identified model is MA (3) as the most representative in the study of this data series. The MA (3) is:

$$VAT = c_1\varepsilon_{t-1} + c_2\varepsilon_{t-2} + c_3\varepsilon_{t-3} + \varepsilon_t \qquad (8)$$

The next step is to test the significance of each parameter of the series with the Student test. Student statistics values for the four parameters are larger in absolute value than the table equal to 1.96 for a significance level of 5%. Thus, we conclude that the null hypothesis H_0 is rejected for all time series parameters; they are significantly different from zero to the level of total population.

Testing the validity of the model MA(3) requires independent analysis of the errors, of homoscedasticity and normality of errors.

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In testing independence of errors we can start from the equation

$$\varepsilon_t = \rho_1 \hat{\varepsilon}_{t-1} + \rho_2 \hat{\varepsilon}_{t-2} + \rho_3 \hat{\varepsilon}_{t-3} + \alpha_1 \mu_{t-1} + \alpha_2 \mu_{t-2} + \omega_t \qquad (9)$$

The following hypotheses are issued:

H_0: $\rho_1 = \rho_2 = \rho_3 = \mu_1 = \mu_2 = 0$ - independent errors

H_1: $\rho_1 \neq \rho_2 \neq \rho_3 \neq \mu_1 \neq \mu_2 \neq 0$ - dependent errors

As $LM_{calc} = 0,00$ şi $\chi^2_{tab(1;73)} = 3.84$ $\chi^2_{tab(1;73)} = 3.84$ we can conclude that the errors are independent, this also being confirmed by *t – statistic* values, which are all smaller in absolute value than 1,96, all coefficient being statistically equal to zero.

Regarding testing of homoscedscity of errors, as $LM_{calc} = 0,12$ şi $\chi^2_{tab(1;36)} = 3.84$, we can conclude that the errors are homoscedastic, so the model is valid.

At testing the hypothesis of normality of errors, as $JB_{calc} = 6.57 < \chi^2_{tab(\alpha;5)} = 9.21$, we can say that it can not be rejected at the level of the total population, the errors being normally distributed

As all three hypotheses about the random variable were checked, results that model MA (3) is valid, and thus can be used for making predictions.

Knowing that in March 2012 the amounts deducted from VAT recorded in Oradea were 10.556.670 lei, and using the point estimate, from calculations performed using Eviews program, we concluded that if they would be influenced only by their development over time, their value in April 2012 would be 6.280.860 lei.

Another way of estimating the dependent variable besides the point estimate is the confidence interval estimation. A graphical representations of the predictions by confidence intervals are shown in Fig. 8.
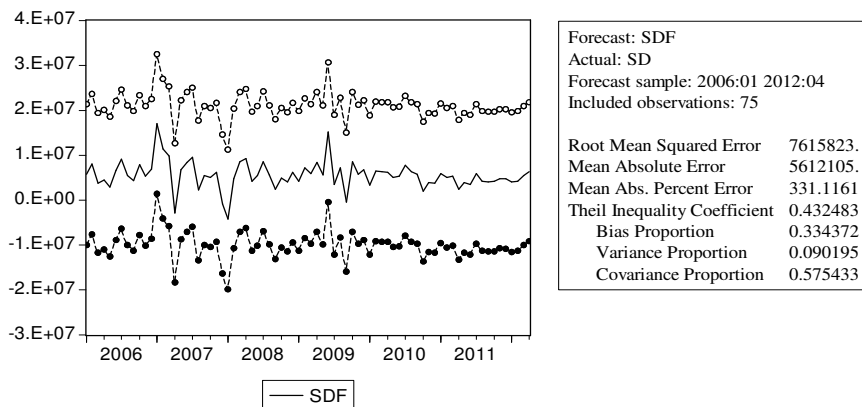
Fig. 8. Forecast of dependent variable – amounts deducted from VAT (Source: author's calculation).

5. Conclusion

Comparing forecasts of revenues obtained by Oradea in April 2012 with actual revenues received, according to the account of the local budget execution, we can draw some conclusions concerning the accuracy of selected models.

Thus, in terms of shares deducted from income tax, the estimated value for April 2012 was 7,537,652 lei, growing compared to previous month, while the actual amount was 10,085,068 lei, growing compared to previous month. Thus we can conclude that, although we eliminated seasonality, the variable dependent on the shares deducted from global income tax do not depend so

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much on its evolution in time, as depends on other factors   not taken into account in this model - regional GDP, average salary, the gross investment in the region (Radu et. all, 2009).

The estimated amount of property taxes for April 2012 was 4,631,498 lei, a lot down than the previous month, while the actual amount was 5.712.246 lei. Although both values are falling compared to the previous month, nevertheless the difference between estimated and actual value is important. Therefore, it can be concluded that property taxes depend upon their evolution in time, but to a less significant extent.

With regard to subsidies from the state budget and other administrations, their estimated value was 1,786,084 lei, while the amount actually received by Oradea in April 2012 was 948,586 lei. Note that the actual amount entered is well below the forecast, so we deduce that this dependent variable is affected to a lesser extent of its evolution in time than other factors.

The amounts deducted from VAT transferred to Oradea in April 2012 were 9.697.480 lei, about 50% higher than the estimated value of 6.280.860 lei. Although the estimated value and the real are down from the recorded value of this variable in the previous month (10.556.670 lei), given the large difference between the first two, we conclude that the amounts deducted from VAT depend less on their evolution in time than the other determinant variables which were not included in the model (number of companies registered in the municipality, the monthly gross investment, regional GDP monthly, monthly consumption/capita).

In conclusion, as we identified different valid time series models with which we were able to estimate the four categories of income chosen for Oradea, we suggest using a more complex mix of local budget justification methods, including as many determinants as possible (historical value of the dependent variable, unemployment, inflation, fiscal policies, the number of companies registered in the municipality, the monthly gross investment, regional monthly GDP, monthly consumption/capita, average wage).

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IMPLEMENTATION OF INFORMATION SECURITY MANAGEMENT SYSTEM

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Abstract. An ISMS is a newly used conception that includes a sum of all requirements and measures. It is defined as a set of measures and requirements in order to secure protection and security of all important corporate assets, i.e. information, know-how, property and persons that is implemented according to the recognized international standard (ISO / IEC 27001 : 2005 in Czech Republic ČSN ISO / IEC 27001 : 2006). The very implementation of information security management system is not either simple or cheap matter. In this paper a procedure in individual steps has been suggested which will methodically lead to and facilitate the very implementation - from a decision made on the ISMS implementation by the management up to a certification awarded by an independent certification authority.

Keywords: information security management system, information security, security policy, security management.

JEL Classification: M15.

1. Introduction

Information security management system (ISMS) is considered as a comprehensive solution of information, persons and property protection at their circulation, processing and use with regard to their availability, integrity and confidentiality (Anderson, 2008).

Every piece of information in the organization has to meet three criteria. Confidentiality means that only the person who is competent to receive the information will get it. Availability then suggests that the information is available in a real time. It is to say that the information need not be immediately available (on-line) but it still has to have its actual value for a receiver. The last criterion is the integrity ensuring that the information is complete by its content and no its piece is missing or lost.

The ISMS can be defined as part of the organization management overall system based on organization's approach to the risks of activities which is focused on the construction, installation, operation, monitoring, reviewing, maintaining and improving of information security.

2. Phases of implementation ISMS

From my experience in the ISMS implementation I can recommend to distinguish the following phases that we can see on Fig. 1.

```
                          ┌─────────┐
                          │  Start  │
                          └─────────┘
                               │
         ┌─────────────────────────────────────────────┐
         │   Management decision on ISMS implementation │
         └─────────────────────────────────────────────┘
                               │
         ┌─────────────────────────────────────────────┐
         │   Determination of ISMS scope and boundaries │
         └─────────────────────────────────────────────┘
                               │
         ┌─────────────────────────────────────────────┐
         │  Initial (situational) audit or the initial analysis │
         └─────────────────────────────────────────────┘
                               │
         ┌─────────────────────────────────────────────┐
         │  Security policy determination (ISMS policy) │
         └─────────────────────────────────────────────┘
                               │
              ┌──────────────────────────┐
              │       Risk analysis       │
              └──────────────────────────┘
                               │
              ┌──────────────────────────┐
              │        Schedule           │
              └──────────────────────────┘
                               │
         ┌─────────────────────────────────────────────┐
         │   Development of compulsory documents        │
         └─────────────────────────────────────────────┘
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      ┌────────────────────────────────────────────────────┐
      │ Implementation, putting into practice, employees training │
      └────────────────────────────────────────────────────┘
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              ┌──────────────────────────┐
              │      Systems analysis      │
              └──────────────────────────┘
                               │
              ┌──────────────────────────┐
              │   Audit and ISMS certification │
              └──────────────────────────┘
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                        ┌───────────────┐
                        │ Certificate ISMS │
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Fig. 1. Phases of implementation ISMS (Source: author).

Management decision on ISMS implementation
The ISMS implementation has to be a strategic decision made by organization's leadership. As it regards a system of management which is strongly integrated into the most important processes of the organization it would not be possible to implement, operate and maintain the ISMS without the efficient support from the management (Kovacich, 2008).

Determination of ISMS scope and boundaries
At the beginning of the implementation it is necessary to determine the ISMS scope and boundaries, what will be protected and which areas the ISMS will be applied to. Everything is determined on the basis of specific features of business activities, organization, location, assets and technologies include details on restrictions and confirmation of all exceptions from the scope. To do so it is necessary to gather a lot of information and documents (Šebesta et al., 2006). A summary (a list) of information assets (i.e. data, information, property) which are important and vulnerable in terms of information security serves as a source for the determination of ISMS scope and structure.

Initial (situational) audit or the initial analysis
From the initial analysis the present state of information security will follow as well as the structure, valuation and natural ownership of information assets. For that reason a certain reassessment of the ISMS scope and boundaries can occur.

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The auditor comprehensively and methodically puts his requirements on the audit and its scope into effect. He examines whether the documentation is in compliance with the relevant regulations and standards. At the very workplace the auditor verifies a compliance of carried out activities with the requirements of relevant documentation. In case it is necessary an employee is asked for cooperation with the auditor who puts him/her targeted questions leading to finding out the required knowledge of facts and the examined person's orientation in his own field of activity (ČSN EN ISO 19011, 2003).

On the basis of the suggested methodology the scores are assigned to questions evaluating particular areas (processes) within the audit which will be stated in the audit protocol.

The auditor evaluates the ISMS according to the following criteria:

- Is the subject of the question incorporated in the ISMS in writing in all contexts and necessities (in an integrated handbook and in other documents)?
- Are procedures determined in the documentation put into practice?

Evaluation of particular areas:

- 5 points: The subject of the question is fully determined in the ISMS and it is effectively proved.
- 4 points: The subject of the question is not fully determined in the ISMS but it is effectively proved.
- 3 points: The subject of the question is fully determined in the ISMS and it is predominantly effectively proved
- 2 points: The subject of the question is not fully determined in the ISMS but is predominantly effectively proved.
- 0 points: The subject of the question is not fully proved in the ISMS independently on the completeness of subject determination in the ISMS.

The expression 'predominantly' means that more than approximately 75 % of all relevant requirements are effectively determined and there is not any special risk of affecting the quality.

If the answer to the question whether the element in the ISMS is described or the answer to the question whether it is applied in practice is 'NO' then a corrective measure (CM) is always applied. As long as the element is described or applied partly then it is within the powers of the searched area manager whether he/she will accept CM or whether the problem can be solved operatively without the application of CM. In a comprehensive ISMS evaluation the equal weight is assigned to every question.

Security policy determination (ISMS policy)

Security policy is a compulsory document. It is based on organization's specific conditions, its processes, structure and used assets. Such compulsory document must be approved by organization's top management and all members of organization's staff must be familiar with it (ČSN ISO/IEC 27001, 2006).

A minimum content of the ISMS policy should include goals in the ISMS area, overall strategy, and the framework of ISMS principles, requirements arising from organization's main activities, legislative, prescriptive requirements and contractual obligations, organization and liability structure and information security ties in organization management system and the determination of criteria and ways of risks management, and the basic security measures.

Risk analysis

The way of risk evaluation and management is quite individual for every organization. In particular it is necessary to choose a methodology for risk identification and valuation and to define criteria on the basis of which it will be decided when the risk is acceptable for the organization and when it is not.

It is good to describe a definition of appropriate method including the choice of metrics for risk evaluation in a directive. As an appropriate methodology some of known and elaborated

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methodologies for risk evaluation, e.g. CRAMM, OCTAVE or COBRA should be chosen (ČSN ISO/IEC 15408, 2005).

Risk analysis is an essential process for the ISMS. It is one of the most important stages for setting security policy of the organization. It is a process of comparing estimated risks against benefit or price of possible security measures. Significance of rigorous risk analysis is essential. The choice of appropriate SW is not important for risk analysis but the choice of method and mainly the choice of a qualified and experienced team of experts is of great importance.

The following types of risk analysis are known:
- Approximate risk analysis
- Elementary risk analysis
- Informal risk analysis
- Combined risk analysis
- Detailed risk analysis

Among methods of detailed risk analysis there are:
  o Matrix with predefined values
  o Estimations of frequency and a possible change of risks
  o Distinction among risks - which can be tolerated and which cannot be tolerated
  o Classification of threats according to the degree of risk
  o Risk analysis using matrix of assets, threats and vulnerability

Risk analysis can be also carried out by means of software instruments such as e.g. CRAMM, RA2 Art of Risk, CORAS and etc.

Risk analysis includes the valuation of information in terms of consequences resulting from the loss of availability, confidentiality and integrity, the identification of threatens size and vulnerability, and the determination of level of risk for information system critical assets.

Based on the risk analysis it is always necessary to prepare a detailed report with the description of risks and their threat. This report has to be presented to the management and the best thing is to have it also approved by the organization's management.

It is possible to calculate an average risk factor (RF) of the analyzed asset from the resulting risk indices. The overall assessment can make it possible to assign a risk group to every asset and to indicate significant risks for the asset.

Output of the analysis is a draft of goals for risk reduction. In working towards these ends, programs for risk reduction are worked out. Programs serve as a guideline for the implementation of specific proposal for a risk minimization measure.

Schedule

Important element of the implementation is a schedule of particular phases and subtasks. In addition to a time frame (the time of commencement and completion) the owners of particular tasks must be there to assume responsibility for their completion (Drastich, 2011).

Development of compulsory documents

Internal documentation which is necessary for management of individual processes and activities can be carried out in an electronic or paper form. External documentation (standards, manuals or legislation) mostly exist in a paper or electronic form (ČSN ISO/IEC 27002, 2008 and 27005, 2008).

Documentation is divided into three basic layers. Records on the ISMS which are made on the basis of managed forms are part of the 3rd layer of documentation:

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1. Layer - Security handbook
2. Layer - Directives
3. Layer - Forms – Records
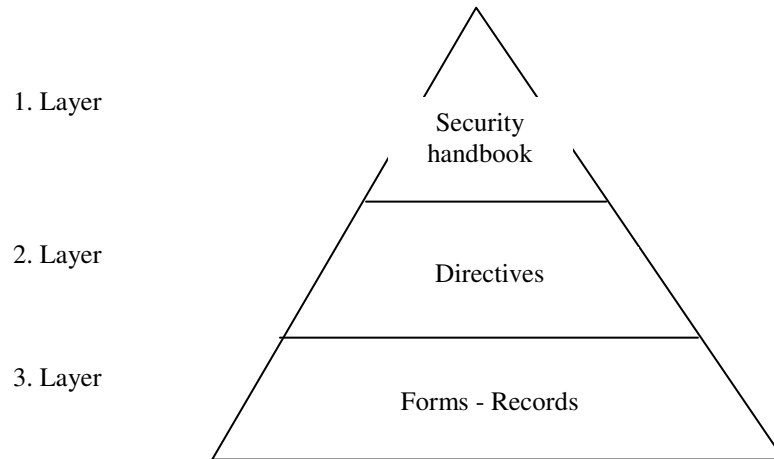
Fig. 2. The 3rd layer of documentation (Source: author).

The following can be ranked among ISMS basic documents:
1. Security policy including ISMS scope and subject,
2. Statement of applicability (SOA),
3. List of assets,
4. Classification of information,
5. Documents and reports management,
6. Disagreements (discrepencies) management,
7. Management of measures to remedy and preventive measures,
8. ISMS internal audits,
9. Analysis and risk evaluation including the report itself,
10. Risk management plan,
11. Plans of disaster and recovery, business continuity.

Within a security frame the following plans have to be drafted:
1. Continuity maintenance plan (main activities) - Business Continuity Plan,
2. Backup and recovery plan - Disaster Recovery Plan,
3. Disaster plans (for individual IS) and the list of all disaster plans,
4. Plan of disaster plans testing,
5. Plan of safety education and training,
6. Plan of ISMS audits.

Implementation, putting into practice, employees training
Another step in the ISMS implementation is its putting into practice. This includes a creation of forms and records filling in. Among the basic forms there are patterns for the creation of safety manual, protocols, and statements of applicability. Forms for appointments or representatives, forms for attendance lists, customer satisfaction and complaint protocol, forms for risk reduction program and settlement of disputes are also created (ČSN EN ISO/IEC 17021, 2007).

Filled in forms represent records such as internal audit plans, reports on the ISMS state, reports on a review worked out by the management. Furthermore, there are records of individual corrective and preventive measures, their evidence and a follow-up check.

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Systems analysis

Systems analysis procedure and its evaluation are carried out analogously to the initial analysis. By the choice of the same methodology including questions, a rating is arrived at that can be compared with the initial analysis. If any deficiencies appear then corrective and preventive measures are worked out to be applied (ČSN.ISO, 2008).

Audit and ISMS certification

The audit and ISMS certification is internationally valid verification by the third party (usually by an independent certification authority) according to the ISO/IEC 27001:2005 standard completed by a certificate that gives organizations and its clients a proof confirming that the organization meets all requirements put on the system of management, security, protection and retention of information.

3. Conditions for acquiring a certificate according to the ISO/IEC 27001:2005 standard

In order to meet the requirements of the certification authority for the information security system the organization has to implement all requirements defined in the ISO/IEC 27001:2005 standard.

To be awarded a certificate the organization has to have:
- defined its policy of security,
- introduced the ISMS system on the basis of carried out risk analysis while the ISMS has to provide control mechanisms for managing the identified risks.

For the audit of the organization according to the ISO/IEC 27001:2005 standard, the information security management system has to be fully implemented, it has to have records on ISMS operation and on possible incidents it has to have the ISMS system audit carried out as well as a review of the whole ISMS in full as prescribed by standard.

In a certified system there must be:
- ensured that information security is an indivisible part of the company management system,
- backup and contingency systems have to support a reliable system,
- employees have to be responsible for confident information at their workplaces and with their clients (customers),
- requirement for continuous development has to produce a long-term efficiency of invested costs.

4. Conclusion

In the first stage of the audit especially the documentation including risk analysis and a statement of applicability are checked and examined. On the basis of the 1st stage results a report on the audit is prepared. In case some discrepancies have occurred then it is stated in a protocol from the audit. The organization has to react to discrepancies and deficiencies in a form of corrective measures.

In the second stage the system of information security is reviewed already in the full extent according to the provisions of ISO/IEC 27001:2005 standard. Also corrective measures from the audit of the first stage that the organization had to accept to make up for the discrepancies and deficiencies from that audit are checked.

On the basis of a positive result from the audit of the 2nd stage a certificate is consequently written out for the organization. By certification, however, the process is not completed because in accordance with the rules for certified organizations such organizations have to undergo subsequent audits to show that their ISMS management system is still functional and it improves. So-called surveillance audits are performed by a certification authority within 12 months from the award of certification. This process is repeated every year but the scope of surveillance audit is lower. Every third year a so-called re-certification audit is then performed approximately to the same extent as a certification audit.

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LABOR MOBILITY IN CENTRAL EUROPEAN EU-MEMBER COUNTRIES

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Abstract. We analyze labor market flows in the Czech Republic (CR), Slovakia and Poland over the period 2004–2007, using the monthly data from the longitudinal EU-SILC database. To our knowledge the use of the matched longitudinal monthly data of the EU-SILC database for a comparative labor market flows analysis in Europe represents a novelty. We find that relative involvement of working-age population in gross labor market flows is approximately five times lower in these central European countries than in the U.S. /UK. In addition the fairly low degree of mobility in central European labor markets is confirmed by the analysis of transition probabilities (hazard rates). Here the differences in comparison with the U.S./UK are again of a relatively high magnitude, above all with respect to the hazard rate of moving from unemployment to employment and vice versa.

Keywords: Central Europe, EU-SILC, labor market flows, longitudinal data, transition probabilities.

JEL Classification: E24, J60, J63, J64.

1. Introduction

Movements of working-age population between various labor market states (i.e., between employment, unemployment and inactivity) are usually referred to in the literature as *gross labor market* or *workers flows* and serve as one of commonly accepted proxies for labor mobility approximations. These flows involve various mobility channels such as new entries into labor market, separations from employment, or exits from unemployment. We start our analysis with description of this concept in the following section.

In Europe labor flows analyses are conventionally based on *quarterly* Labour Force Surveys (LFSs). In the U.S. equivalent analyses are typically based on *monthly* data from the Current Population Survey (CPS). Thus practically all comparisons of labor mobility between Europe and the U.S. have systematically suffered from the different frequency/ methodology of data collection, and the results of such comparisons are rather inconclusive.

Our results are based on longitudinal EU-SILC monthly data. The use of monthly data lowers the potential biases which stem from the use of quarterly data for labor market flows analyses (see, e.g. Gomez, 2009). In addition longitudinal monthly EU-SILC data enable more meaningful comparisons of labor mobility between the U.S. and European countries. To our knowledge the use of the matched longitudinal monthly data of the EU-SILC database for a comparative labor market flows analysis in Europe represents a novelty, which is in more detail described in Section 3.

Afterwards, in Section 4, we quantify gross labor market flows in countries covered by our analysis (Czech Republic, Slovakia, Poland) for the period 2004–2007, and establish the probabilities for a working-age individual to move from one labor market status to another. This makes it possible to (i) judge the degree of labour market mobility in central European countries, and (ii) compare the results with selected reference countries. The last section then concludes.

2. Methodology

There is a relatively long tradition in labor market flows research (see Abowd and Zellner, 1985; Blanchard and Diamond, 1990; or Burda and Wyplosz, 1994 for some of the first analyses in the U.S.

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/ European context). Also central Europe is covered by similar analyses (see e.g. Gora and Lehmann, 1992; Bellman et al., 1995; Boeri, 1996; Šorm and Terrel, 2000; Večerník, 2001; Gottvald, 2005; Flek and Večerník, 2007; or Cazes and Nesporova, 2007).

The essence of labor marker flows analysis is as follows: At any period t, each individual can be either employed (E_t), unemployed (U_t) or inactive (I_t). In the next period ($t + 1$) the same individual can remain in an unchanged labor market status or change it. The former situation is characterized by continuing employment ($E_t \rightarrow E_{t+1}$), continuing unemployment ($U_t \rightarrow U_{t+1}$), or continuing inactivity ($I_t \rightarrow I_{t+1}$). In the later situation the individual status changes in the following six ways: ($E_t \rightarrow U_{t+1}$); ($E_t \rightarrow I_{t+1}$); ($U_t \rightarrow E_{t+1}$); ($U_t \rightarrow I_{t+1}$); ($I_t \rightarrow E_{t+1}$); and ($I_t \rightarrow U_{t+1}$).

Any period ($t + 1$) thus features a certain number (the sum of six possible gross flows) of individuals whose labor market status has changed since the initial period (t). Depending on the availability of data, this framework allows to calculate the average (monthly, quarterly) number of individuals involved in each gross labor market flow. Such results serve for labor mobility approximations both at national levels and internationally.

Our approach allows for using the U.S. as a reference country. This seems plausible since the American labor market is believed to be more mobile (flexible) than those of European economies. Exploring the longitudinal EU-SILC monthly data we can test in a specific way the validity of this assumption and support/reject it by new quantifications for central European countries. Unfortunately, the longitudinal EU-SILC database is not yet fully functioning in providing results for the whole European Union and thus the possibility to compare our results obtained for central European countries with the EU as a whole or some representative EU-member country is limited.

European research has typically explored the LFS-based quarterly data, and their results are therefore difficult to compare with ours. As noted earlier, the LFSs data available for research purposes typically lacked the longitudinal structure. The only exception available to us is the full longitudinal structure of quarterly LFS data for the UK, as used e.g., by Gomez (2009). That is why we also partly refer to the UK when interpreting our results for central European counties. One must admit, however, that cross-country comparisons of results based on monthly and quarterly data can be done only conditionally and must be viewed with caution.

3. The Data

The Statistics on Income and Living Conditions (EU-SILC) is an annual household panel survey where respondents state their monthly economic activity retrospectively for the whole previous calendar year. Launched in 2005 in most European countries, EU-SILC is designed as a four-year rotational panel survey with approximately one quarter of households dropped and replaced with a new random sample every year.

The most recent longitudinal dataset EU-SILC 2008 covers the period 1/2004–12/2007 and involves three rotational groups (the initial four-year sample plus two additional three- and two-year ones). The sample design allows us to follow the development in the monthly labor market status (employed, unemployed, or inactive) of individuals from the initial rotational group who were surveyed for 48 consecutive months, i.e., for the maximum period.

We limit our four-year sample to working-age population, i.e., to those who are between 16 and 65 during the investigation. Finally, there is an additional attrition of approximately 20 per cent of respondents caused by refusals, non-contacts, untracked changes of residence, leaving the survey population, and deaths. This leaves us eventually with 5,071 individuals for the Czech Republic, 2,099 for Slovakia, and 5,441 for Poland.

These numbers are adjusted by longitudinal weights designed by Eurostat specifically for the four-year subsamples. The weights calibrate the final national samples which outlasted the surveyed 4-year period from the initial rotational groups. Our samples can thus be viewed as pure panels, rather

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than rotational ones, where all month-to-month labor market states of individuals are matched by definition.[14] This minimizes the *non-response* or *attrition bias*, which is otherwise present in typical rotational group samples.

Job-to-job movements cannot be analyzed by EU-SILC data. Respondents are asked whether they changed their jobs during the last year, yet neither the month nor the number of changes are recorded. Research based on LFS data typically captures both gross flows and job-to-job movements of workers, thus leaving EU-SILC the only survey suffering from this omission.

Eurostat harmonizes the national LFSs and provides an integrated dataset EU-LFS. Although both EU-SILC and EU-LFS are designed as rotational panels and could serve as bases for longitudinal datasets, Eurostat does not make the international longitudinal datasets of EU-LSF available for research purposes.[15] This gives the EU-SILC another unique advantage for labor flows analysis, as it enables international comparisons based on longitudinal data.[16]

The most serious problem with both EU-SILC and LFS-based data (and even with the CPS) potentially consists in incorrectly reported data. It is commonly believed that due to this *response-error bias* labor market status changes are overestimated. For example, incorrectly recording one unemployment status within a long period of actual employment would indicate two labor market status changes, instead of none at all.

According to Abowd and Zellner (1985), gross flows of workers between employment and unemployment in the U.S. are rather unaffected by this bias, while it remarkably influences gross flows from and to inactivity, and the total volume of gross labor market flows is therefore overestimated. To cope with this bias, Abowd and Zellner (1985) apply re-interview data while others, such as Silverstone and Bell (2010), include supplementary questions (e.g., about the duration of the respondents' employment, their job-search, or how long since they received a paid job). Without this the bias remains unaccounted for.[17]

4. The Results

Based on 47 month-to-month observations in each country, we calculate the average monthly number of individuals involved in gross labor market flows (see Figures 1–3). But for the sake of comparability we start our analysis with percentage shares of working-age population involved in gross labor market flows, rather than with the absolute working-age-population numbers. Then we proceed with the analysis of transition probabilities of moving from one labour market status to another.

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[14] This approach enables a 100% month-to-month match in Slovakia. However, the construction of longitudinal weights differs in Poland where the weighting procedure of a 4-year sample still includes some individuals who stopped participating in the survey in the second, third and/or fourth year. This causes only a 96.9% level of actual matching in a weighted 4-year Polish sample. A similar yet quantitatively less relevant problem applies to the Czech sample with the actual matching level of 99.8%. Labor flows might display strong seasonal patterns. If we analyzed these flows in time series, we would apply seasonal adjustments, as does most of the existing research. Since we limit ourselves on cross-country comparisons, we believe that the use of raw monthly gross flows averaged over the whole investigated period can be justified.

[15] The attempt to use the harmonized EU-LFS for comparative labor flows analysis is reprezented by Cassado, Fernandez and Jimeno (2011). But, for the above mentioned reasons, this research is actually based on *cross-sectional* EU-LFS with a retrospective question on labour market status in previous year.

[16] For more details on EU-SILC methodology see e.g. Mysíková (2011) or European Commission (2007, 2010).

[17] Although the precise month of the labor market status change can be unclear, it does not affect our results of analyzing *average* monthly gross labor market flows: declaring that changes occurred between December and January although they actually occurred between February and March does not influence monthly averages for the whole period.

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5. Gross Labor Market Flows

The quantifications of gross labour market flows in central European countries are summarized in the following Table 1.

Table 1. Gross Labor Market Flows in Central Europe, 2004–2007.

	$(E_t \rightarrow U_{t+1})$	$(E_t \rightarrow I_{t+1})$	$(U_t \rightarrow E_{t+1})$	$(U_t \rightarrow I_{t+1})$	$(I_t \rightarrow E_{t+1})$	$(I_t \rightarrow U_{t+1})$
Czech R.	0.24	0.23	0.32	0.09	0.18	0.11
Slovakia	0.26	0.16	0.38	0.08	0.19	0.12
Poland	0.34	0.30	0.49	0.15	0.33	0.14

Notes: Monthly averages in per cent of working-age population (16–65); weighted matched sample.
Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011; own calculations.

On average monthly gross labor market flows in the CR involve 1.17 per cent of working-age population. For other countries covered by our analysis, the respective figures are 1.19 per cent for Slovakia and 1.75 per cent for Poland (row totals from Table 1). Three specific features of these results are worth commenting on.

First, our results indicate a considerably lower degree of mobility on central European labor markets compared to the U.S. / UK. In the U.S. the monthly gross flows involve on average between 5% and 7% of working-age population, depending on the analyzed period and author.[18] The quarterly results for the UK are similar, as evidenced by Gomez (2009).

Second, all three analyzed central European labor markets appear to display rather modest differences in relative involvement of working-age population in average monthly gross labor market flows: The respective difference between the Polish and Czech labor market, or in other words between the most "mobile" and the most "rigid" labor market, amounts to just around half a percentage point (1.74% – 1.17%).

Third, similar patterns of labor mobility are manifested in structural terms across all central European countries: Average monthly gross flows between employment and unemployment $(E_t \rightarrow U_{t+1}; U_t \rightarrow E_{t+1})$ represent in sum more than one half of total gross labor market flows in all central European countries analyzed in Table 1. The overall labor market dynamics in central Europe is therefore determined by these two flows.

Furthermore, Table 1 reports that in all countries the most robust gross flow is the one from unemployment to employment $(U_t \rightarrow E_{t+1})$, which is with equal uniformity followed by gross flow in opposite direction $(E_t \rightarrow U_{t+1})$. But, as far as the two abovementioned gross flows are concerned, and especially the one from unemployment to employment, the CR has the lowest values: While in the CR it involves on average some 0.3 per cent of working-age population per month, in Slovakia and Poland the respective figures are 0.4 and 0.5 per cent.

Our main finding here is that similar mobility patterns prevail across all central European labor markets. However, the CR appears to have a slightly more rigid mobility channels between unemployment and employment in relative terms.

Results in Table 1 also indicate existing structural dissimilarity between central European and UK/U.S. patterns of labor mobility. In the U.S. and in the UK gross flows between employment and unemployment (in both directions) account, according to Gomez (2009), for only about one third of total monthly/quarterly gross flows, with the gross flows between employment and inactivity (and *vice versa*) as the relatively most relevant ones.

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[18] These results do not involve job-to-job flows (see Gomez 2009 for an overview), and are therefore comparable with ours. Note that the results for the U.S. refer to averages derived from one or even two decades of monthly observations, while our data cover just a four-year period 2004–2007. When we refer to the UK, one has additionally to consider the quarterly structure of the UK data which might generate over/underestimated results.

6. Transition Probabilities

Figures 1–3 also involve transition probabilities (hazard rates), i.e., rates at which each individual is faced with a "hazard" of changing their labor market status next month. These probabilities can formally be expressed as first-order Markov transitions where the individual finds him/herself in a new (or initial) labor market status at time $(t + 1)$, depending on his/her labor market status at time t.

For instance, $UE = (U_t \rightarrow E_{t+1})/U_t$ indicates the individual probability to exit unemployment (U_t), and move to employment (E_{t+1}). All possible transitions of this sort form a 3x3 matrix where the diagonal terms represent unchanged labor market states over time (*EE, UU, II*). Each row also involves two off-diagonal terms indicating possible status transitions (*EU, EI; UE, UI; IE; IU*).

In a fully rigid labor market the off-diagonal terms would equal zero. Conversely, in a totally fluid labor market with 100% transitions between states, the diagonal terms would be zero. See e.g. Silverstone and Bell (2010); or Gottvald (2005) for more methodological detail.

Analogously to the analysis of gross labor market flows, the results concerning such hazard rates in central European labor markets are highly similar, and at the same time remarkably different from those obtained for the U.S. or the UK. In central Europe the probability that an unemployed will become employed next month ranges between 4.6 per cent and 5.0 per cent (see Fig. 1 – Fig. 3).

Yet, this probability in the U.S. and the UK is much higher (Fallick and Fleischman, 2004 established its average monthly value for the U.S. in 1996–2003 at 28.3 per cent; Gomez, 2009 reported that its quarterly average value in 1996–2007 in UK was 27.8 per cent). This leaves central European unemployed with a striking one-in-five chance of receiving a job compared to their U.S. (or UK) counterparts.[19]

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[19] To further interpret this result: For every 100 currently unemployed persons in the US, on average 28 would become employed next month. In central Europe the same prospect concerns as a maximum 5 individuals in every 100 unemployed.
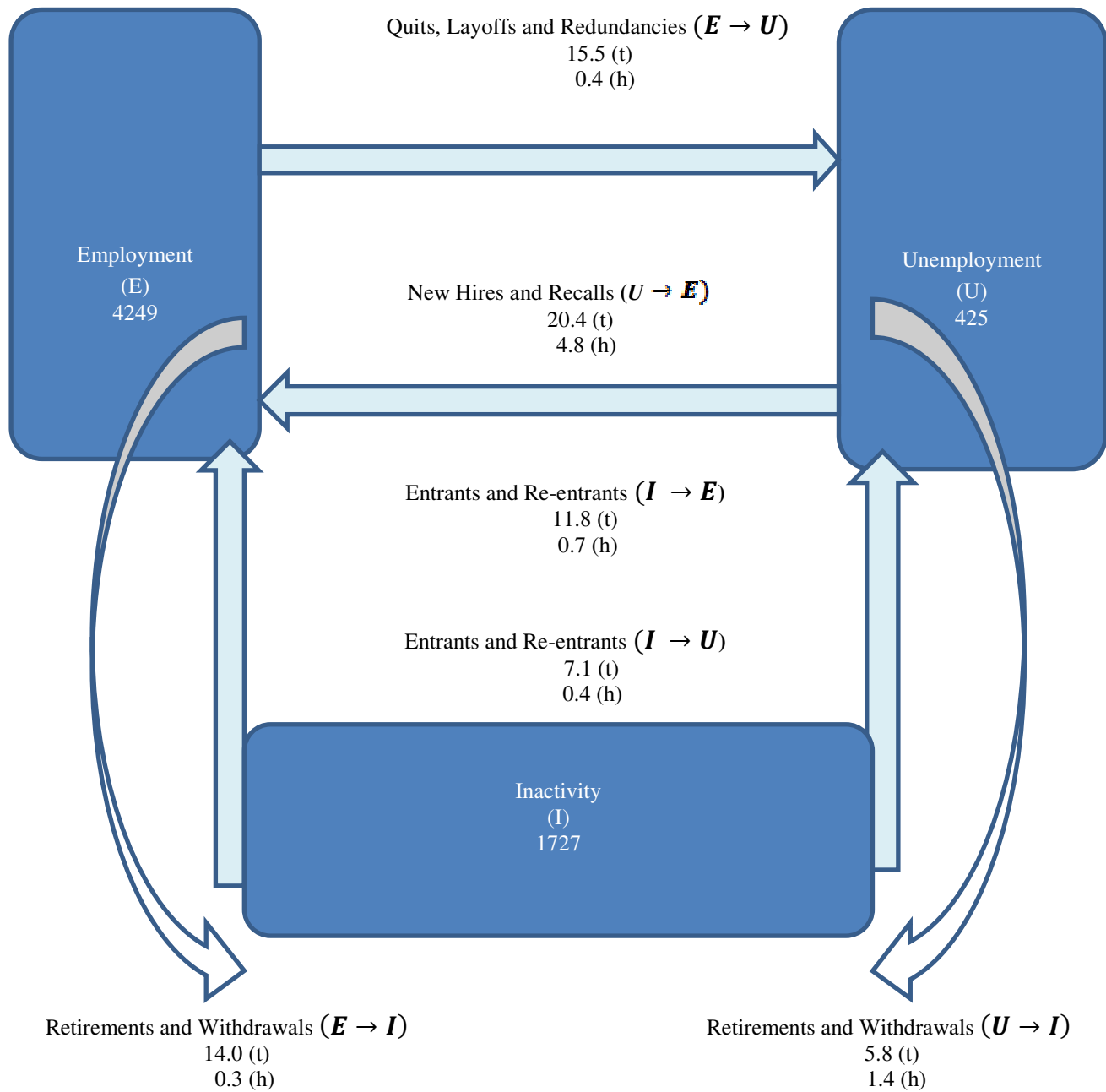
Fig. 1. Gross Labor Market Flows in the Czech Republic, 2004–2007 (Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011, own calculations).

Notes: Number of people (16–65) in thousands (t); hazard rate of changing labor market status in per cent (h).

Quits, Layoffs and Redundancies $(E \rightarrow U)$
9.6 (t)
0.4 (h)

Employment
(E)
2324

New Hires and Recalls $(U \rightarrow E)$
14.0 (t)
5.0 (h)

Unemployment
(U)
282

Entrants and Re-entrants $(I \rightarrow E)$
7.1 (t)
0.7 (h)

Entrants and Re-entrants $(I \rightarrow U)$
4.4 (t)
0.4 (h)

Inactivity
(I)
1046

Retirements and Withdrawals $(E \rightarrow I)$
5.9 (t)
0.3 (h)

Retirements and Withdrawals $(U \rightarrow I)$
2.9 (t)
1.0 (h)
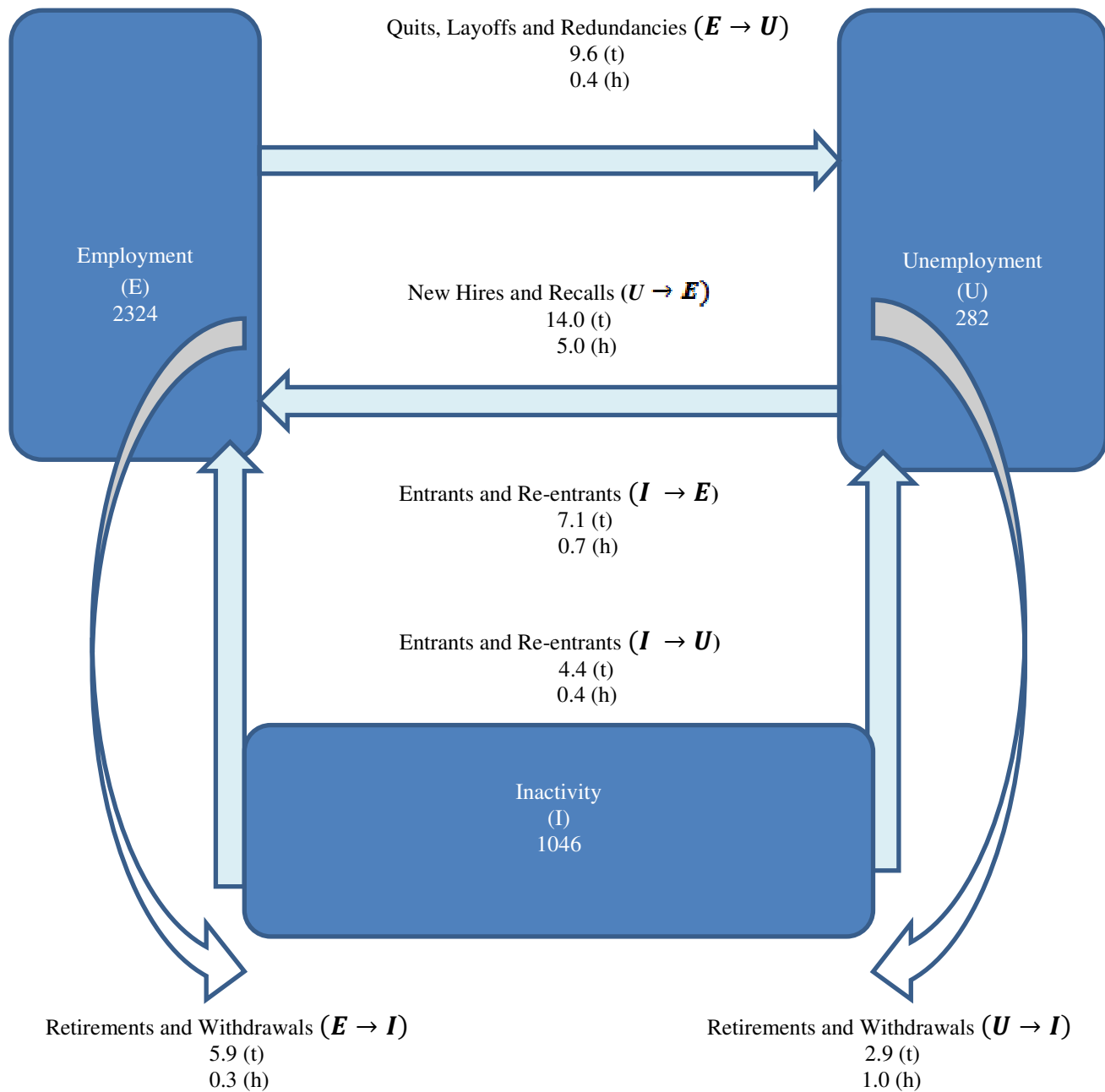
Fig. 2. Gross Labor Market Flows in Slovakia, 2004–2007 (Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011, own calculations).
Notes: Number of people (16–65) in thousands (t); hazard rate of changing labor market status in per cent (h).

Quits, Layoffs and Redundancies $(E \rightarrow U)$
72.4 (t)
0.6 (h)

Employment
(E)
11889

New Hires and Recalls $(U \rightarrow E)$
104.7 (t)
4.6 (h)

Unemployment
(U)
2272

Entrants and Re-entrants $(I \rightarrow E)$
69.7 (t)
1.0 (h)

Entrants and Re-entrants $(I \rightarrow U)$
30.4 (t)
0.4 (h)

Inactivity
(I)
7217

Retirements and Withdrawals $(E \rightarrow I)$
63.3 (t)
0.5 (h)

Retirements and Withdrawals $(U \rightarrow I)$
32.4 (t)
1.4 (h)
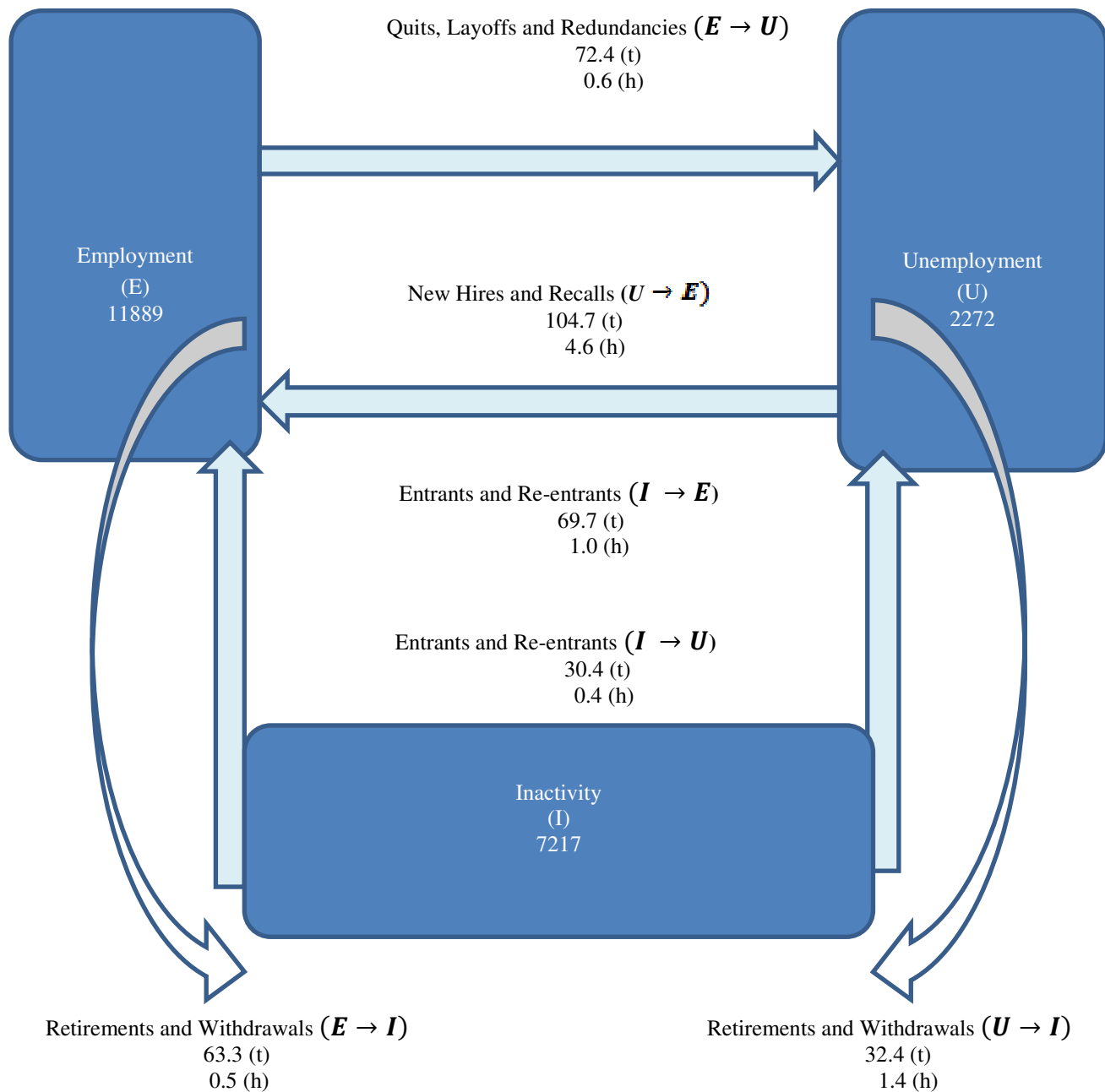
Fig. 3. Gross Labor Market Flows in Poland, 2004–2007 (Source: EU-SILC LONGITUDINAL UDB 2008, version 3 of August 2011, own calculations).

Notes: Number of people (16–65) in thousands (t); hazard rate of changing labor market status in per cent (h).

As can be seen in Fig. 1 – Fig. 3, the probability of losing job and entering the pool of unemployed next month ranges between 0.4 per cent and 0.6 per cent in central Europe. This is again much less than in the UK and the U.S., where in both cases this probability reaches 1.3 per cent (Fallick and Fleischman, 2004; Gomez, 2009). It follows that the risk of losing a job and becoming unemployed is two or even three times lower in central Europe than in the U.S. or UK.

7. Conclusion

A relatively modest share of working-age population (between 1–2 per cent) appears to be involved in average monthly gross flows in central European labor markets. This indicator of overall labor mobility is approximately five times lower than one in the U.S. or in the UK.

In addition the fairly low degree of mobility in central European labor markets is confirmed by the analysis of transition probabilities (hazard rates). Here the differences in comparison with the U.S./UK are again of a similar magnitude, above all with respect to the hazard rate of moving from unemployment to employment and vice versa.

8. Acknowledgement

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DEMOGRAPHIC PROGRESSION OF THE MORAVIAN-SILESIAN REGION

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Abstract. Moravian-Silesian region belong between the administrative units, whose progression is characterized by long-term population decline. Whereas that progression of population in region is one of the index number, which significantly affects business environment in the region, we focused in this article on detailed analysis of these issues. The number of inhabitants in Moravian-Silesian region decreased during last twenty one years by more than fifty thousand inhabitants and this is the reason why area loses a position of the most populous region of the Czech Republic. Although the causes of population decline was found in both natural increase and migration in the area, as more serious problem appears to us a negative emigration balance. In this case is long-term progression of the region in contradiction with progression of the rest regions in the Czech Republic.

Keywords: population, Moravian-Silesian region, natural increase of population, population migration, net migration.

JEL Classification: J11, J13, J61.

1. Introduction

During the 90thies, the Czech Republic has undergone a number of relatively intense socio-economic changes, which are then also reflected in the demographic progression. Although the intensity of these changes in all regions is essentially the same, we can find in the Czech Republic regions for which the above changes affect the demographics of the region generally positive and regions where those changes influenced the evolution of the population rather negatively. These administrative units may also include the Moravian-Silesian region, which is characterized by long-term population decline. This negative trend of progression is beginning to appear as a serious during last three years. Given the demographic trends in the region is usually closely connected with the progression of the regional labor market and influences to a considerable extent their own business environment of the region, it seems to us to analyze the issue as a very interesting and extremely useful. For this reason we decided to give this matter our attention to in our research project, which is part of the Student grant competition of the Silesian University in Opava, and which has signification SGS/7/2012: "The influence of regional disparities on the business environment" and whose goal is address the issue of classification and evaluation of regional disparities and their impact on the business environment.

For quality assessment of impact of regional differences on progression of business environment, we need to reveal the economic and non-economic factors which affect the economic life of the region. Given that one of the regions that appear to be suitable for analyzing the impact of disparities on the business environment of the Moravian-Silesian region (as well as MS-region), we focused in this paper to this region, our analysis will be the basis for subsequent analysis of the development on the regional labor market, but also to evaluate the impact of differences observed on the business environment of the region.

2. Development of number of inhabitants in Moravian-Silesian region

According to preliminary data, there were on 31th December 2011 in the Moravian-Silesian region 1230.5 thousand persons, which is historically the lowest number of population, which was registered

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in the territory of the last day of the year. Compared to the previous year, the population declined quite dramatically, by 12.7 thousand persons, which was basically confirmed by long-term trend decline in the population, the amount is between 1991 and 2011 decreased by 50.5 thousand people.

If we seek the cause of development, then in general come to the conclusion that the Moravian-Silesian region to some extent follows the basic features that the behavior of citizens in the Czech Republic began to appear at the turn of the century.

For the most visible manifestations of this development in accordance with the Mulíček (Kolektiv autorů, 2006, p. 10), we consider the significant decline in fertility, the development of effective stabilization of the number of deaths, marriages decline and stagnation at the same time a divorce, and last but not least, stop the process of territorial concentration of population, which is, in our opinion, witnessed by the significant outflow of population from the Ostrava-Karvina agglomeration.

Although the above population decline appears to be relatively strong, Moravian-Silesian region remains one of the three most populous regions of the Czech Republic, when it in the past three years ahead of us, period only Prague with 1241.3 thousand person and the Central Bohemian region with 1,279.1 thousand residents.

Table 1. The population of the Moravian-Silesian Region by district in 2000 and 2011 (situation in 31.12. of relevant year).

	Population		Population Share of the Region		Increase/Decrease	
	2000	2011	2000	2011	absolute	relative
Bruntál	100 598	96 335	7,90%	7,83%	-4 263	-4,24%
Frýdek-Místek	210 638	211 835	16,54%	17,21%	1 197	0,57%
Karviná	283 317	263 039	22,25%	21,38%	-20 278	-7,16%
Nový Jičín	154 006	152 221	12,09%	12,37%	-1 785	-1,16%
Opava	177 940	177 158	13,97%	14,40%	-782	-0,44%
Ostrava	347 038	329 946	27,25%	26,81%	-17 092	-4,93%

Source: own calculation, Czech Statistical Office, 2012.

Looking at the development of the Moravian-Silesian region population in terms of individual districts (see Table 1), then come to the conclusion that the district with the largest population in the region is from the long-term Ostrava district, who in 2011 with nearly 330 thousand residents participated in the total population of the county 26.81%. For the district with the smallest population can be a mark on Bruntál district of whose share of total population in the Moravian-Silesian region reached a value of 7.83%. As is evident from table 1, for the MS-region is characterized by long-term population decline, which in our analysis period most evident in Karviná district, where in the first eleven years of the new millennium, the number of residents about 7.16%, which in absolute terms means loss of more than 20 thousand people, and then in the districts of Ostrava and Bruntál, where we saw a relative decline in population of more than four percentage points (-4.93% in the district of Ostrava and -4.24% in the district Bruntál), which in absolute terms, indicating a fall of 17, 1, respectively 4.3 thousand people. The only district of the Moravian-Silesian region, which in the years 2000 to 2011 marked not decrease but increase in population and the District of Frýdek-Místek, in which case not only increased the number of people living in the region of 0.57 percentage points, which in absolute terms means growth by 1.2 thousand people but also its share of the total population in the region, which from the original 16.54% to the final rose 17.21%.

3. The unaffected increase of population of Moravian-Silesian region

The change in demographic behavior, we can in the Moravian-Silesian region, as in the whole Czech Republic, reported in the last decade of last century, often compared to the second demographic

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transition, which began in Western Europe in the late 70s and 80s the last century. As stated in (Žák et al., 2002, p. 184), the second demographic revolution in Western Europe showed "A sharp decline in fertility to below the level of restorative (it seems that the total fertility rate will stabilize somewhere at 1.7, about 1.7 children per woman per lifetime), mainly by reducing the mortality of old people (life expectancy of pensioners extended by about 20%) and intense international migration (migration increase is to maintain a substantial population size). This means that the population is rapidly aging and potentially dying while facing the challenges of immigration." The demographic transition then as Koschin closely related to the "knowledge revolution and the structural, cultural and technological change, which brings (the emergence of new categories knowledge workers, strengthening the role of education, the principle of equality in all areas [access to education, the emancipation of women, development of democracy], information and communication technology)", which are factors that since the early 90s years quite significantly affect not only the demographic development in the Czech Republic but also in the Moravian-Silesian region.

Based on the available statistical data, then we find that in the last decade of last century the Moravian-Silesian region substantial period of fertility decline in intensity when the number of live births per female decreased from 1.68 in 1993 to 1.13 in 2000. The value of the total fertility rate in the MS-region within eight years, declined by 0.55 children per woman, making this region in the Czech Republic at the beginning of the new millennium found in tenth place of the chart, and lower total fertility rate reached only Zlín Region (1.13), South (1.10), Olomouc (1.10) and the capital city Prague (1.07).

This period of decline was then succeeded by a period of intensification of fertility, which peaked in 2007 when the number of live births per woman during her reproductive period increased from 1.32 to 1.44. The last two years for which we have statistical data then we can mark the years of stagnation total fertility rate. Over the past eighteen years, the Moravian-Silesian region ranked among the five counties with the lowest total fertility rate in the Czech Republic (see Table 2).

Development of total fertility rate is a major toll on the development of natural increase of population, whose development was mainly due to relatively rapid changes in fertility rates and relatively small changes in the intensity of mortality, as evidenced by the data captured in Fig. 1. If we start from these data, then we arrive at the conclusion of which shows that from 1991 to 2000 was the Ostrava region characterized by rather strong decline in the birth-rate, which is the initial value decreased to 13.50 ‰ has so far reached the lowest value of 8, 83 ‰, which means that in ten years in the county decreased number of live births per one thousand population of nearly five people. Like the total fertility rate, the birth-rate in the case we can start the new millennium to record an increase of this indicator, with the greatest intensity of growth, the gross birth rate between 2006 and 2007, when increased by 0.79 ‰. On the contrary, with the most marked decrease in the number of live births per thousand inhabitants can be found in the last year we analyzed the period when the value of this indicator fell by 0.94 per thousand, ie by almost one child per thousand inhabitants.

Table 2. Total fertility rate in the Czech Republic and in the Moravian-Silesian Region in the years 2000 – 2010.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Czech Republic	1,144	1,146	1,171	1,179	1,226	1,282	1,328	1,438	1,497	1,492	1,493
Moravian-Silesian Region	1,128	1,159	1,176	1,196	1,233	1,284	1,319	1,440	1,463	1,468	1,474

Source: Czech Statistical Office, 2011.
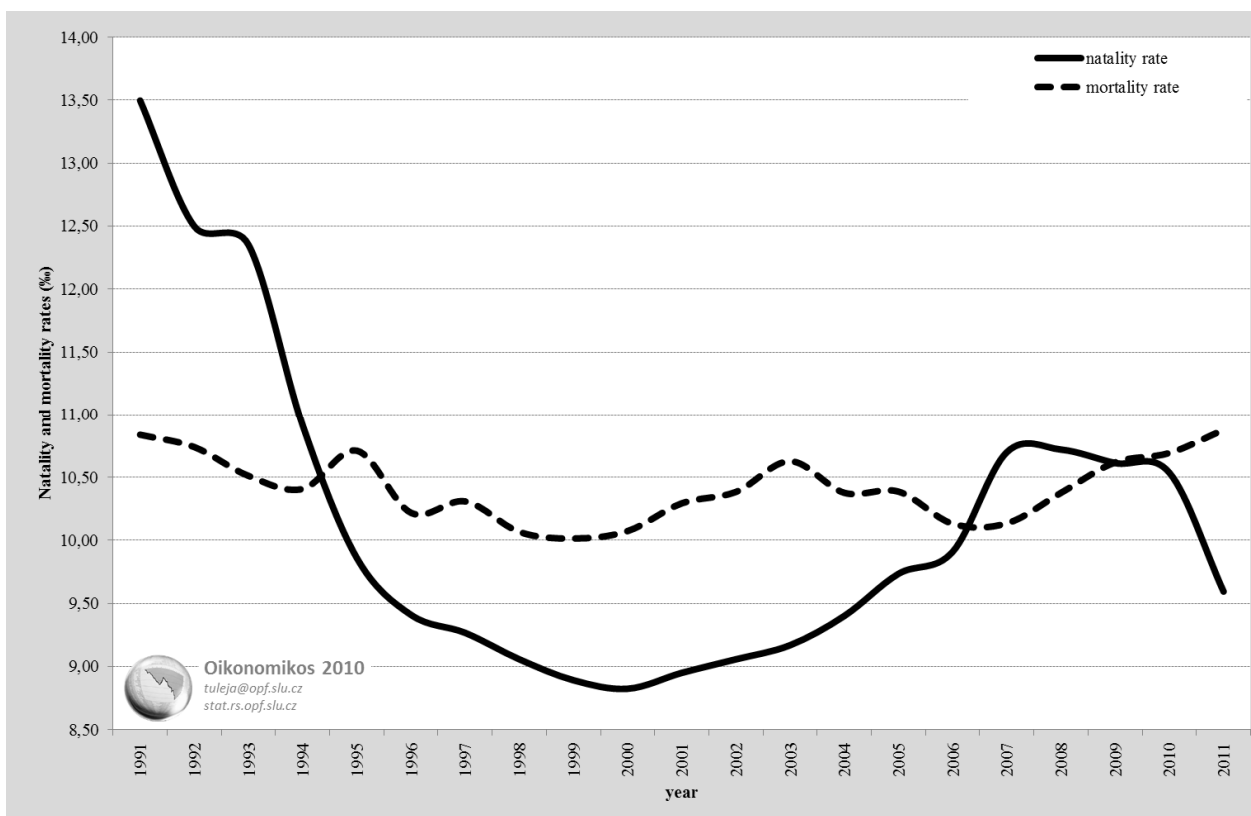
Fig. 1. The development of natality and mortality rates in the Moravian-Silesian Region in 1991-2011
(Source: own calculation based on data of Czech Statistical Office, 2012).

Also, the mortality rate can be in the last decade of the 20th century record of almost continuous decline in the value of this indicator, with the rate of this decrease is not as pronounced as in the birth rate. This decrease was first replaced by the following years, a gradual increase in the number of deaths per 1 000 inhabitants, and then again decrease mortality rates, and this very positive development was halted in 2007, when one thousand inhabitants of the Region accounted for 10.14 deaths. Since 2008, then again in the region are rising mortality rate, while in 2011 the rate of mortality in the county value 10.88 ‰, which is the highest value of this indicator in the Region since 1991.

As is evident from the data captured in Figure 1, during the last two decades, the birth rate exceeded the death rate only in the years 1991-1994 and between 2007 and 2008. The greatest excess in mortality over the birth rate can then be recorded in 2003, when the death rate exceeded the birth rate of 1.46 ‰, which in absolute terms means that the natural decrease of population in the Region that year amounted to 1,830 inhabitants. Based on the above can be stated that the decline in natural population growth can be described as one of the important factors of population decline in the MS-region, with positive trends that we have seen over the years 2007 and 2008, were mainly in the last year we turn into the analysis period already mentioned above, the significant drop in birth rates, which are then reflected in the development of natural population growth, the value in absolute terms reached in the year above -1577 people.

4. Migration of inhabitants in Moravian-Silesian region

The changes in population structure of the Region, however participated only natural growth, but also internal and external migration, and this factor has on the evolution of the population a significant negative impact. As can be seen from the data captured in Fig. 2, the only year in which we can in the MS-region recorded positive net migration was the year 1992, when the immigrant population in the

Moravian-Silesian region, the number of people who emigrated from the region of 218 persons. In all other years of the period then we can only record a negative migration balance, the greatest number of emigrants overhangs over the number of immigrants can be traced in the last three years, we analyzed the period in which net migration has reached an average value of -3,116.33 persons.
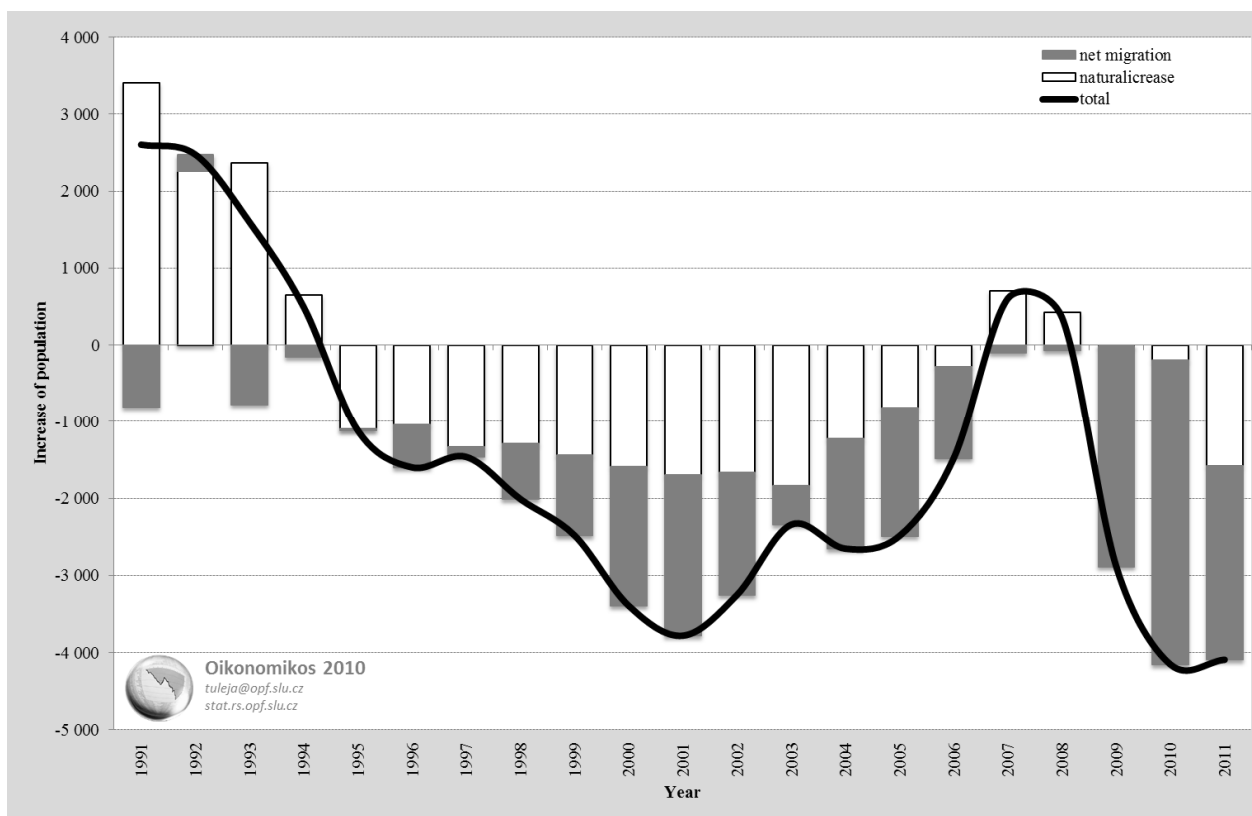
Fig. 2. Total and natural increase and net migration in the Moravian-Silesian Region in 1991-2011
(Source: Czech Statistical Office, 2012).

If we compare the influence of natural increase and net migration to total population growth the Region, then we must conclude that the long term, the total population growth much more strongly involved in natural growth, as evidenced by data from the years 1991 to 2011, when the proportion of indicators in the overall population growth the Moravian-Silesian region had reached 70.22%. If we shorten this time period, only the first decade of the new millennium, then we find that the region is a relatively major change, as a result of the impact of natural increase of the overall population growth is declining. Between 2000 and 2011, the share of the overall rise in the indicator has reached only 49.81% in the last three years, we analyzed the even decreased to less than fifteen percent (14.48%). Based on the foregoing points, we can therefore say that, especially in the last eleven years, the crucial element of demographic trends in the Region becoming the migration balance, which will eventually reach negative values. High turnover of migration, which is evident from Fig. 3, and from the Region, compared with other regions of the Czech Republic, a region with relatively not stabilized population.

A more detailed analysis of net migration come to the conclusion that significant negative effect on the migration balance of the Moravian-Silesian region has an internal migration in the Czech Republic. Based on the available statistical data, then we come to the conclusion, from which it follows that defined in the years 1992 and 2011 from the Moravian-Silesian region to other regions of the Czech Republic moved out of an average of 2,634.67 persons more than immigrated to the region, making the internal net migration contributed to the overall net migration -159.62%. During the

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period analyzed by us in the Moravian-Silesian region also a tendency to promote the deepening negative balance of internal migration, when the first five years (1992-1996) reached the internal migration of population decline in the total amount of 5,529 persons in 1997-2001 9,495 persons in the third five-year period (2002-2006) 12,408 people in the last period of time bounded by the years 2007 and 2011, even 14,604 people.
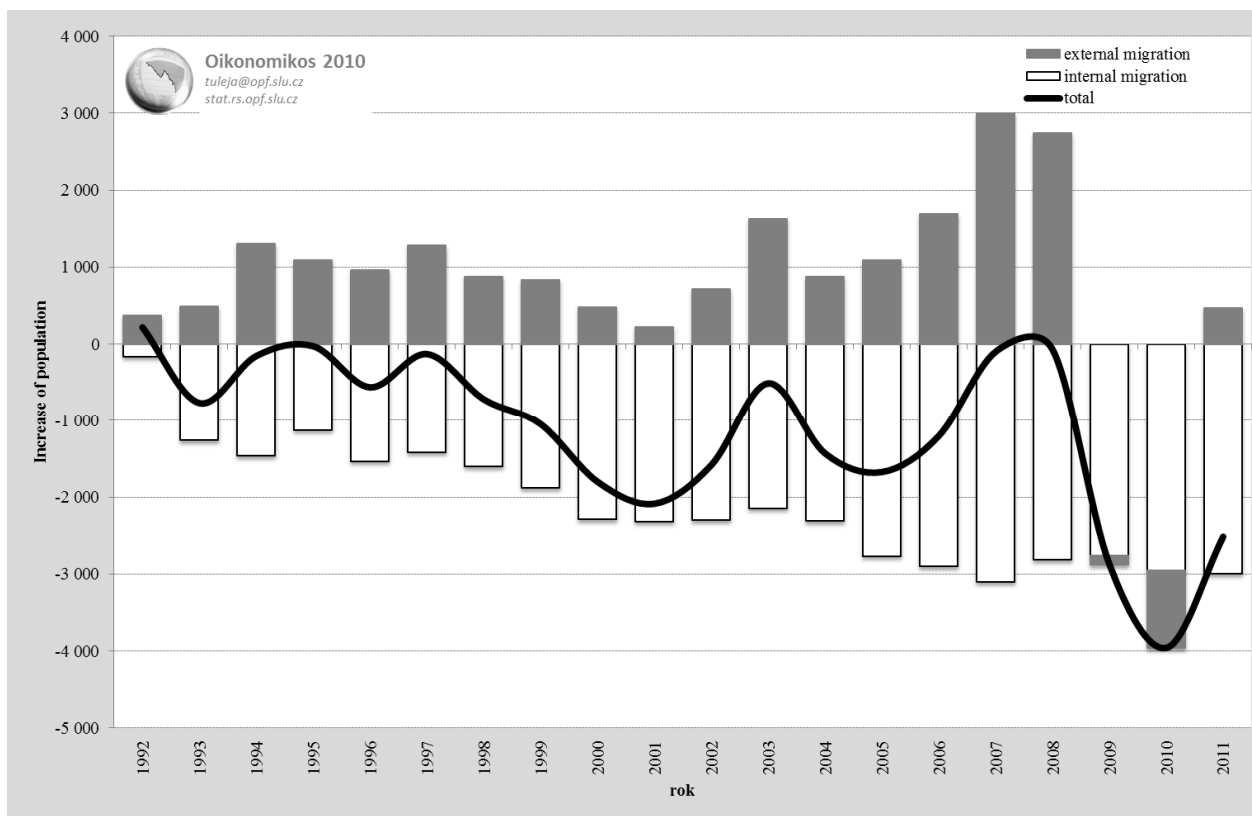
Fig. 3. Net migration according to the way immigration from the Moravian-Silesian Region in 1992-2011
(Source: Czech Statistical Office, 2012).

A somewhat different trend can then be recorded in net migration from abroad where over the years from 1992 to 2011 promote a tendency to a slight increase of this indicator. During the whole period was analyzed by us in the case of international migration for the Moravian-Silesian region, with a minor exception in 2009 and 2010, characterized by positive net migration, which reached an average of 984.08 persons, a figure that has not been able to meet population decline, the which occurred in the region due to the republican national migration. The greatest wave of immigration in the observed region can be found in the peak period of economic boom in the Czech Republic, i.e. between 2006 and 2008, when net migration reached a total amount of 7,435 people. If we again focus on the previously defined five blocks, then we can conclude that accumulated the highest population growth by migration occurred between 2002 and 2006, when the value of this indicator was around 6,005 people, and subsequently in the years 2007 to 2011 where, despite the decline in international migration between 2009 and 2010, we recorded aggregate net increase of population by migration at 5 thousand people (specifically 5087). On the contrary, a period that is characterized by a wave of foreign immigration, the weakest in the Region is defined by time period 1997 to 2001, when the aggregate number of newcomers from abroad exceeds the aggregate number of persons going abroad for "only" 3,712 people.

In terms of individual age groups in 1991-2010 showed the most significant fluctuations in migration population of working age, between fifteen and sixty-four years ago. On the contrary,

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stable development, we can in this time of record population aged 65-years, ie for ages already, due to its great age, for the most part do not feel the need to move. As is evident from Fig. 4, a relatively stable development in the first half of the nineties, there was in the Moravian-Silesian region of the first pronounced brain-age population between 1997 and 2001, when the accumulated value of net migration of the population aged 15 to 64 years reached value of 4,712 people. On this significant outflow of productive population was followed two years left slowing population falling into this age category, which was then followed with a short acceleration again (2004-2005) and short-term slowdown, respectively two-year positive migration balance (2006 and 2007-2008). The second significant wave of emigration pure population of working age in the Moravian-Silesian region then meet us at the end of the period analyzed, from which we monitored the region for two years, moved out more than six thousand people of working age (6,056 people).
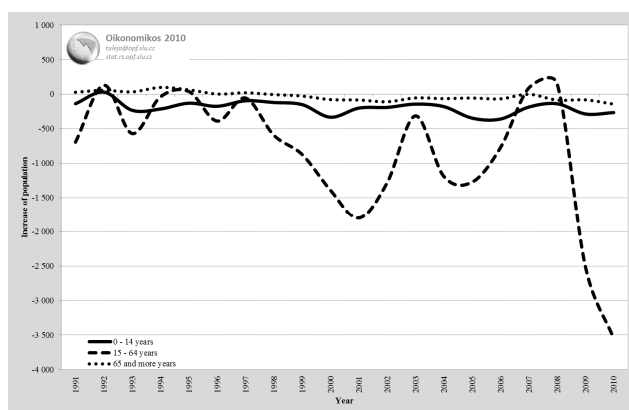
All of categories	Age categories 20 to 34 years
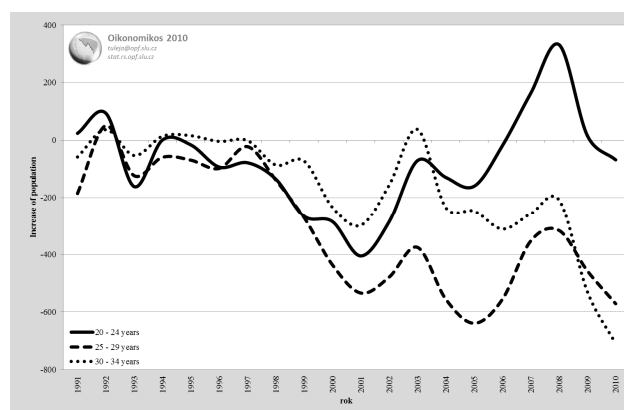
Fig. 4. Net migration in total and by age in the Moravian-Silesian Region in 1991-2010 (Source: Czech Statistical Office, 2011).

As evident from the above, except for certain long-term trend in net migration of working age population were 2007 and 2008, when net migration population of the Region took on positive values. If we look for the positive short-term causes of this turnover, it is found mainly in improving the labor market situation in which there was an increase of job offers opportunities, as evidenced by the development of indicators of the number of job applicants per vacancy (see Fig. 5). These developments were mainly associated with the development of manufacturing industry and the entry of new investors in the various industrial zones located in the region. Specifically, it was the entry of companies:

- Behr Ostrava Czech, s. r. o., PLAKOR CZECH, s. r. o. and CROMODORA WHEELS s. r. o. to the industrial zone Mošnov,
- Brose CZ spol. s r. o., Rieger Automotive International, a. s., DURA Automotive Systems CZ, s. r. o. and Erich Jaeger, s. r. o. to the industrial park Kopřivnice,
- and especially companies: Hyundai Motor Manufacturing Czech s. r. o., Mobis Automotive Czech, s. r. o. and Dymos Czech Republic, s. r. o. in the industrial zone Nošovice.

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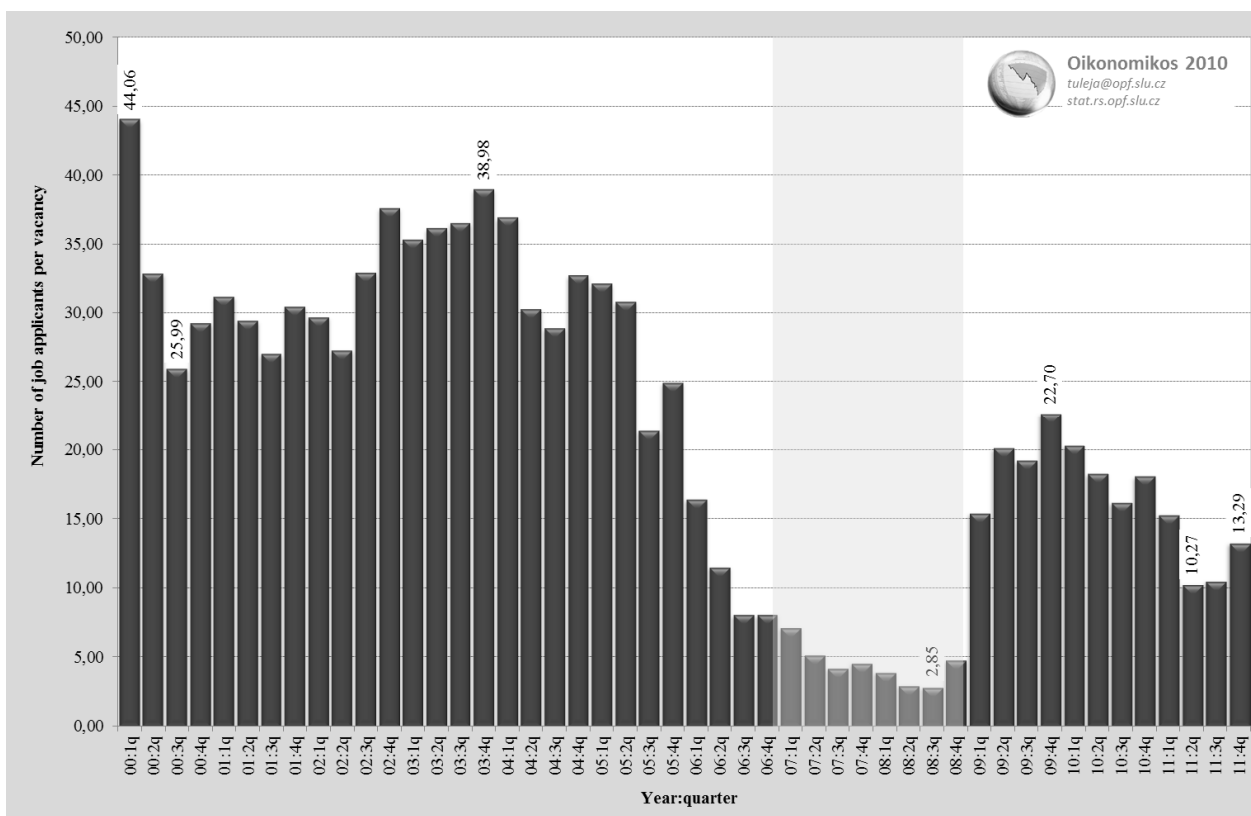
Fig. 5. Number of job seekers for one vacancy in the Moravian-Silesian Region in 2000 – 2011
(Source: own calculation based on data of the Ministry of Labour and Social Affairs of the Czech Republic, 2011).

If we analyze in detail net migration in the age group from 14 to 64 years of age, then we find that the most significant decrease occurred in the analyzed period, we recorded at ages 25 to 29 years, 6,185 people. As seen from the graph 4, the long-term decline in the negative migration balance in this category is in fact since 1997, with the most significant outflow occurred from 1998 to 2001. A similar trend can also record the ages of 30-34 years. Also in this case is more pronounced for the first outflow of the population at the turn of the millennium, in contrast to previous ages, this decline has permanent character, when in 2003 in this age group there is a net increase in migration. After this short-term improvement occurs in the following seven years in the Region in this age group again to deepen depopulation, decline and this culminated in the last two years of our period, when net migration reached -1,239 people, making this age category, brain in terms of working-age population, ranked in the MS-region at the top of the chart, before the age category 25-29 years (-1,028 persons) and 35-39 years (-1001 inhabitants). From the above it is clear that the Moravian-Silesian region often leave people aged from 25 to 40 years who can be expected that their decision to emigrate from the region quite closely related to finding an appropriate job, regardless of whether the adoption of this decision play a decisive role in better financial conditions, or greater security to job retention.

For quite interesting we might call the migration balance in the development of individual districts of the Moravian-Silesian region. As is evident from the data captured in Fig. 6, the only district that in the monitored region long characterized by a positive migration balance, the district Frýdek-Místek, where over twenty years as a result of increased migration of population by 5,320 persons. On the contrary, districts with the largest decline in population are Ostrava-city districts, where between 1991 to 2011 decreased due to migration of population by almost 13 thousand (12,990) and Karvina, for which the population decline was slightly lower when the final value of cumulative net migration in this case amounted to -11,791 persons. Of the remaining three districts may be somewhat more critical to mark the outflow of population from the Bruntál, in which case the net migration balance

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has reached the value of -4017 inhabitants. In the districts of Nový Jičín, Opava and long-term cumulative balance moved at -83 and -237 persons, of which we can conclude that for these districts the population who emigrate from a given district, slightly exceeds the number of people have given district choose as their place of residence.
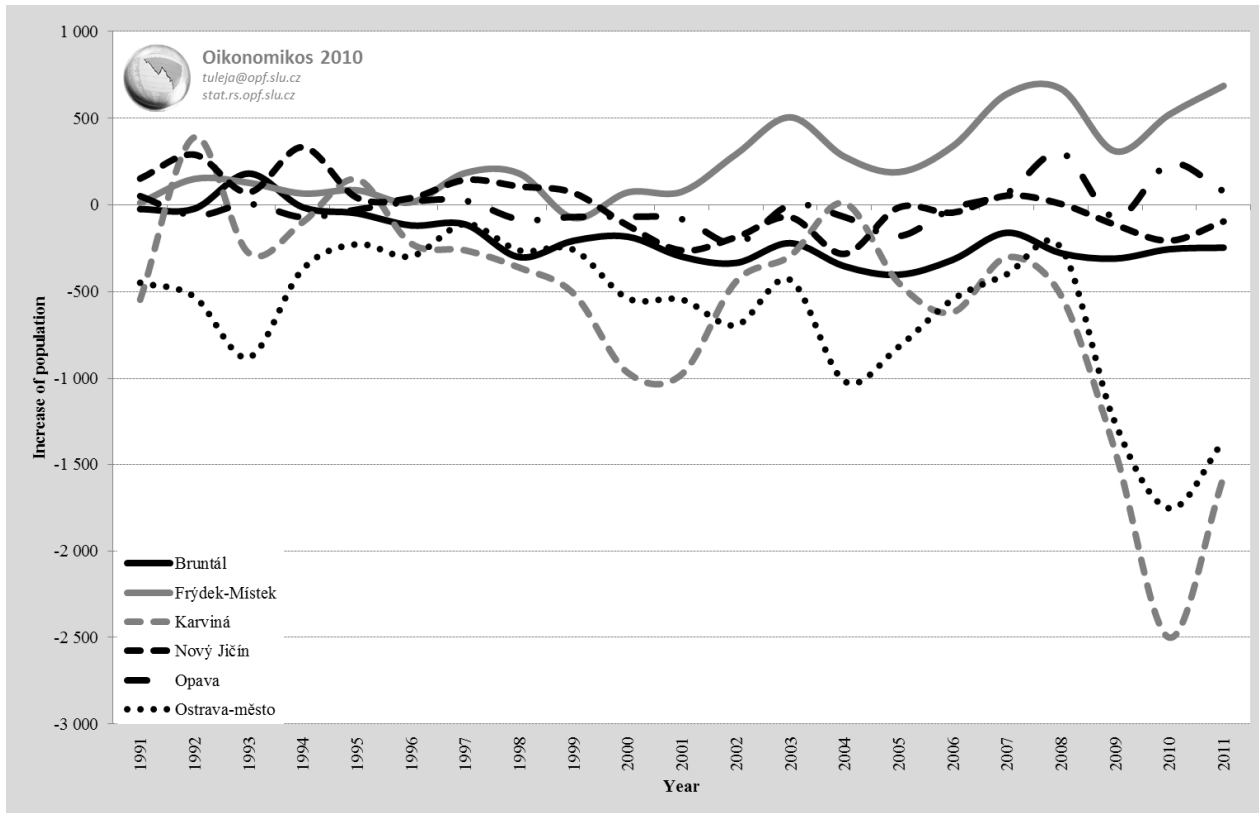
Fig. 6. Net migration of the population in different districts of the Moravian-Silesian Region in 1991-2011 (Source: own calculation based on data of Czech Statistical Office, 2012).

Although the causes of population decline are evident in both natural increase and net migration in the area, as more serious problem is the negative migration balance. Because, as shown in Fig. 7, in this case, the long-term development in the region, contrary to developments in other regions of the Czech Republic.

Between 2009 and 2010 showed the Moravian-Silesian region in comparison with other regions of the Czech Republic 13 lowest values. Although long-term downward trend can be observed in all regions of the Czech Republic and in the Moravian region shows very alarming values.
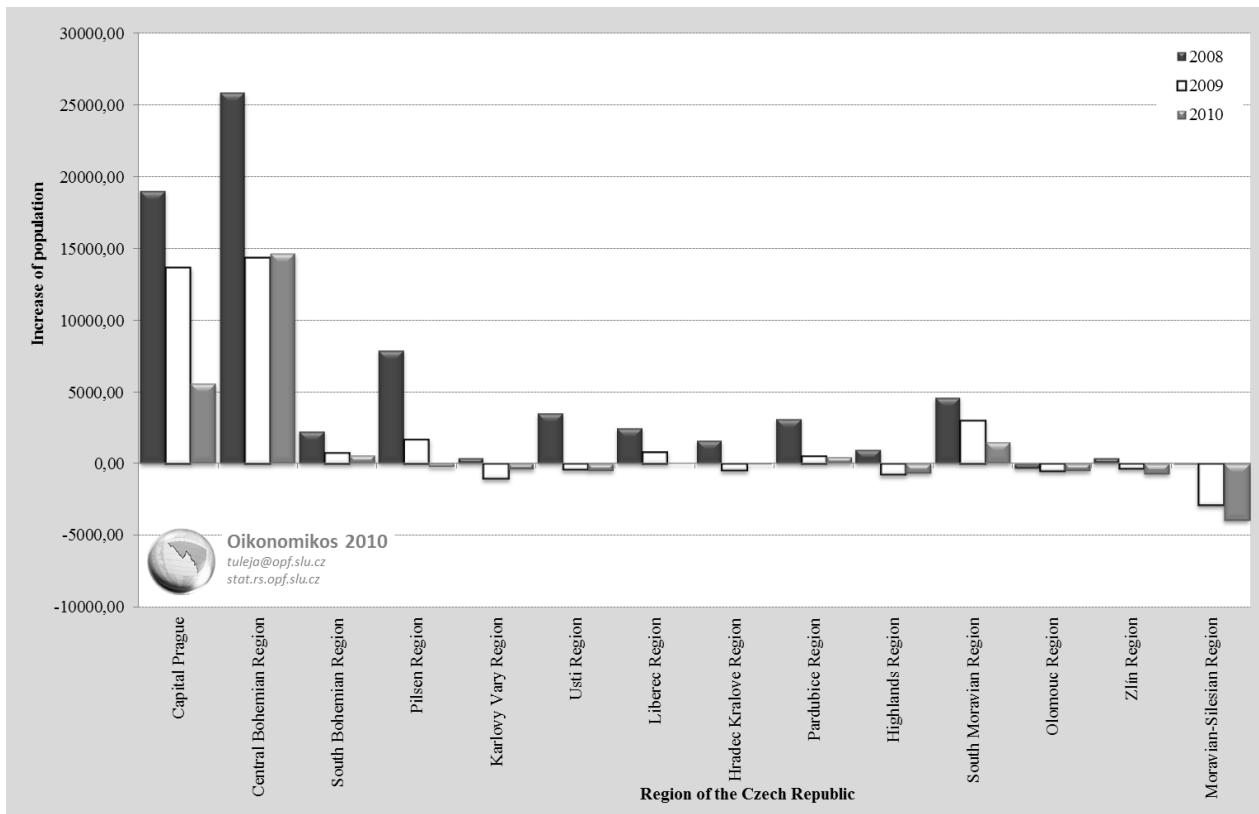
Fig. 7. Comparison of net migration in different regions of the Czech Republic in 2008 – 2010
(Source: Czech Statistical Office, 2010, 2011).

5. Conclusion

In the last twenty one years the population of the Moravian-Silesian region decreased by more than 50 thousand people and the region with 1230.5 thousand. population lost a position as the most populous regions of the Czech Republic, which recently fell to the Central Bohemian region, while in terms of population-MS was also outpaced the Capital Region of Prague. The main factors that led to this negative demographic trends, are especially significant decline in fertility, which was accompanied by the development of effective stabilization of the number of deaths, decrease the number of marriages, putting an end to the territorial concentration of population and significant emigration of the population falling within the age group 25-39 years. If we look at demographic trends in the Moravian-Silesian region in more detail, then we arrive at the conclusion of which shows that the short-term moderate growth or stagnation of the population to which occurred in the early 90 years (1992-1994), in the region, we analyzed the trend has begun to decline in the number of people living in the region, with a minor exception in this development were the years 2007 and 2008 when the population living in the Moravian-Silesian region essentially stagnated. With the decline in population, in addition to the region also suffered from various districts, with one single exception, has been district Frýdek-Místek, which from 1991 to 2011 saw an overall increase in population of 1,197 persons, most likely as a consequence of the effect of suburbanization. On the contrary, the most to this decline in population in the region participating districts Karviná (contribution to the overall decline in population amounted to 47.15%) and Ostrava-city (39.75%).

As in the Czech Republic, also in the Moravian-Silesian region significantly decrease the number of people signed the decrease of fertility, when the number of live births per woman declined from 1.68 in 1993 to 1.47 in 2010, making the Moravian-Silesian Region ranked among the five counties with the lowest total fertility rate in the Czech Republic. Development of total fertility rate is then also

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signed on the development of natural population growth of the region. This was especially influenced by the intense decline in the birth-rate, which over twenty years has decreased from 13.50 to 9.60 ‰, in a situation where the mortality rate has stagnated in its essence (10.84 and 10.88 ‰). Crude birth rates decline and stagnation of crude mortality rates are then reflected in the development index of age, which during our analysis period increased from 51 to 108 people. Growth index of aging is not only due to declining birth-rate, but also increasing life expectancy of the population of Moravian-Silesian Region.

For more serious problem than the decline in natural increase the population, we might call a negative migration balance with which he faced in Moravian-Silesian Region, with a minor exception in 1992, throughout the monitored period. Although the migration balance of the total county population growth long-term negative effect, we can say that the decisive element of the demographic development in the region were mainly in the last eleven years. The available data it is clear that a significant adverse effect on the migration balance the Moravian-Silesian region has an internal migration which the total migration gain contributed -159.62%. In contrast, in net migration from abroad we could see a tendency to light growth. From the perspective of each age group will consider a rather critical situation in a group of people aged 25 to 39 years, in which case long-term record relatively high negative migration balance, which is negatively reflected not only in migration, but most likely also in birth-rate.

6. Acknowledgement

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REGIONAL DISPARITIES IN UKRAINE

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Abstract. Different aspects of the disparities in socio-economic development across the countries and regions have been investigated during the last decades. This paper concerns the number of distinct hypotheses concerning different features causes and impacts of the regional disparities in Ukraine. Empirical verification of these hypotheses based on computation of the Theil Index as a measure of the magnitude of regional disparities showed that: unwanted dynamics of divergence across the regions exists in Ukraine as well as in the other East-European countries; regional disparities are exhibited in intergroup manner and are primarily caused by structural disproportions of economy; hampering interregional linkages and territorial integrity of national economy; disproportional territorial distribution of the foreign investments. The study underlines restraining impact of the regional disparities on economic growth of the national economy.

Keywords: regional disparities, divergence, regional policy.

JEL Classification: R11.

1. Introduction

The State policy is aimed to maintain the continuous and harmonious socio-economic growth of the State. Effectiveness of this policy can be measured by the degree to which the certain actions anticipate this objective. The development of the national economy cannot be considered apart from the regional economies. Harmonious growth of the State is a subsequent result of the ability to generate the gross product by each of the taxonomic units. This ability is determined by two groups of the factors: potential of the region and initial resources allocated within the region; and the way resources are spent. The differences in terms of the both groups of the factors cause imbalances across the regions.

The majority of studies consider regional disparities as a determinant of economic growth. Some of them contain empirical estimates of disparities' impact on economic growth over a long period of time (Barro R., 1999) or across a range of countries (Barro, 1999; Ravallion, 2000; Banerjee and Duflo, 2000).

Besides the cross-country comparisons, significant number of studies has been dedicated to the regional disparities within certain developed countries: USA, UK, Italy, Germany, Netherlands, Belgium, Denmark, Spain, Canada, Sweden (Barro and Sala-i-Martin, 1991, 1995; Sala-i-Martin, 1990, 1996; Shioji, 1993; Coulombe and Lee, 1993; Amstrong and Taylor, 1993; Terrasi, 1999; Perrson, 1992).

Following the existing empirical studies the theoretical model of the relation between the rates of inequality and national economy growth is proposed (Fig. 1).
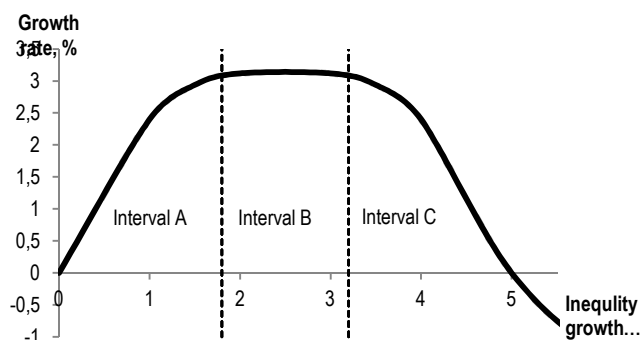
Fig. 1. Relation between inequality and economic growth (Source: created by the author).

Assume that this relation may be divided into three distinct intervals, which represent three impact modes on economic growth:

A – simulative impact;

B – neutral impact;

C – restraining impact.

As it can be seen, there are some bounding rates of inequality growth, which switch the impact modes. The majority of the regional policies are concerned by scholars and governments of the countries impling the restraining impact of the regional disparities. The state policy of the regional development should be certainly directed towards overcoming any negative impacts of this phenomenon. However empirical evidences of the certain impact mode should be gotten prior to the above mentioned policy implications.

The following hypotheses concerning different features and causes and impacts of the regional disparities in Ukraine have been empirically tested in the context of the common notions.

2. Empirical analysis of hypothesis

Hypothesis 1: The majority of East-European economies as well as Ukraine are suffered from the regional disparities constantly deepening

Hereby the dynamics of the regional disparities in Czech Republic, Ukraine, Poland and Romania are illustrated (Fig. 2). In advanced economies regional disparities are most frequently measured by unemployment rate and the level of economic output (GRP) per capita. Slightly less often regional variability is measured through the level of entrepreneurial activity. The applicability of the particular characteristics depends among others on the availability of quality data by the regional classification. Thereby the level of distribution of Gross Regional Product per capita was used to measure regional disparities in the following countries.
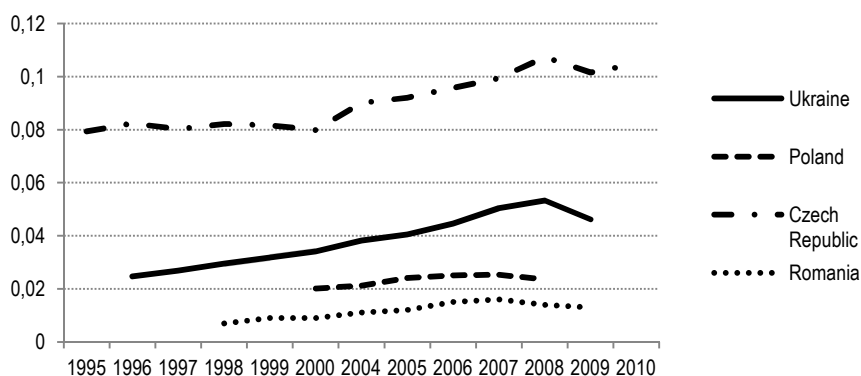
Fig. 2. Dynamics of the regional disparities in East-European countries (Source: Eurostat, 2009, Czech Statistical Office, 2010, Central Statistical Office of Poland, 2008, Romanian National Institute of Statistics, 2008, State Statistics Service of Ukraine, 2010).

It is expressed in Theil Index of territorial distribution of GDP per capita.

As we can see, the regional disparities have been increasing in the majority of given countries through the last decade. In general there is a relatively high level of regional inequality in Ukraine, however in 2009 it has even decreased. This empirical evidence stipulates the regional policies to be on agenda of the major governments of East-European countries and Ukraine.

The causes of the present continuosly tensing regional problem were founded by the soviet regional policy, when the issues of the territorial allocation of resources were primarily concerned in the context of political goal. As a consequence, initial contidions of reforming national economy were characterized by: industrial gigantism, imperfect sectoral structure of the major territorial complexes, ineffective utilization of local resources, monopolization of the economic structures.

Soviet Union collapse radically changed geopolitical and economical state of the states which have been previously included to it. Economic relations of its regions have been broken, free access to ports, automobile and pipeline communications have been lost. The new frontier regions have been emerged and have faced with new infrastructural and production obstacles.

The tendencies of regional disintegration are the crucial factor of the present economic development of the post-communist states. The evidence of the last decades shows that the implications of the regional policies do not consider continuous divergence. As a consequence, the rates of socio-economic development are declining as well as the events which may negatively affect the social order are being accumulated.

Hypothesis 2: Regional disparities have a negative impact on economic development of Ukraine

Persson (1994) developed a model, which implies that inequality in income distribution among different regions within a state has a negative long-run effects on economic growth.

According to Partridge (1997), substantial economic inequality restrains future economic development.

According to Benini (1999), excessive regional disparities in economic development cause the range of the following negative effects which demands for appropriate regional policies:

- regional obstacles for the future economic development including negative externalities, the low level of human capital qualifications, unsatisfactory results of business activities;
- declining internal demand as a result of population outflow, shortage of the local savings and tax proceeds to the local budgets;
- increasing governmental social spendings as a result of the high unemployment rate;
- emerging areas of political and social instability affecting social tensions and destabilization.

Other aspects of the negative impact of the regional disparities can be also mentioned:

- reinforcement of fragmentary and situational manner of state administration. Failure of holistic and effective macroeconomic regulation. Some of the macroeconomic policies, such as fiscal and monetary, may not actually have general desirable effects across the state.
- hampering distribution of economic resources and innovations among the regions. Intensive factors of economic growth are dominated by exhausting extensive factors.
- extensive factors are constantly heightening divergence trends.
- loosing state integrity, increasing risk of interregional conflicts and political destabilization.

Empirical evidence of the following hypothesis in Ukraine is indicated below (Fig. 3), where the rate of growth of the Theil Index is put on the horizontal axe and the rate of growth of the Gross National Product per capita is put on the vertical axe. The average elasticity of the rates of growth of regional disparities to the rates of growth of economic development is less than 1 (0.96), which implies the fact that the economic growth is restrained by the regional disparities.
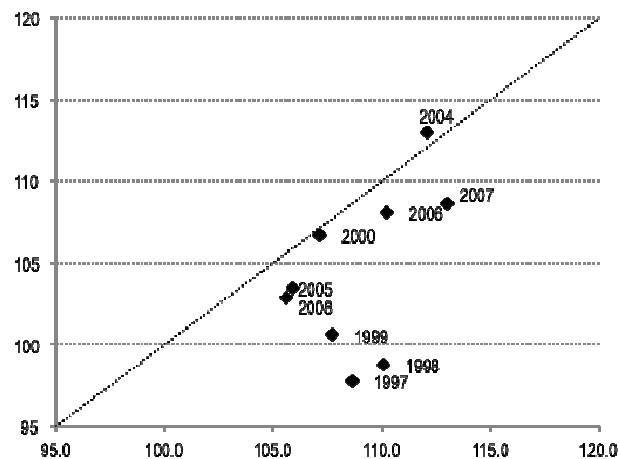
Fig. 3. Matching rates of regional disparities growth and economic development (Source: created by the author).

Hypothesis 3: Regional disparities in Ukraine are exhibited in the intergroup dynamics
Considering the regional disparities in Ukraine across the country the range of the regions (24 administrative districts and the Autonomous Republic of Crimea) have been placed into four distinct groups: Western, Central, Southern and Eastern. Regional disparities have been computed in two dimensions: interregional (among the groups) and intraregional (within the groups).

Empirical data shows that the intergroup component (T_{br}) of the total Theil Index has been increasing much more dramatically than the intragroup one (T_{wr}). This significant difference between inter- and intragroup disparities is the evidence of imperfect interregional integration across the country. The primary cause of that fact is the territorial structure of economy: huge capacities of processing and mining industry are concentrated in Eastern and Central regions (Fig. 4) and do not have any connections with Western and Southern regions.

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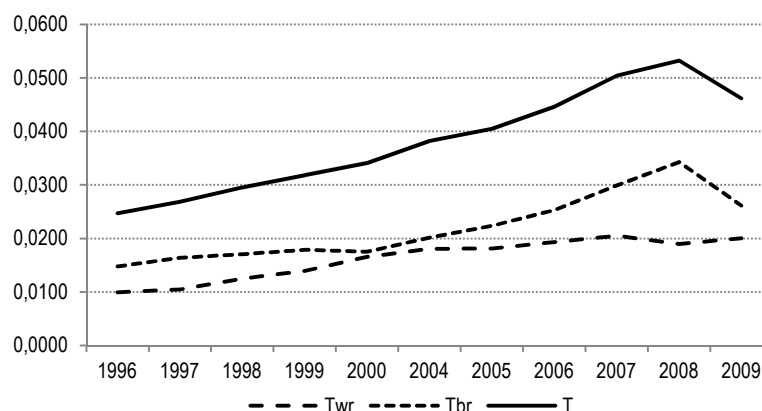
Fig. 4. Dynamics of the total, intergroup and intragroup divergence in Ukraine (in terms of GRP per capita) (Source: created by the author).

Hypothesis 4: Interregional disparities are caused among others by foreign investments to the regions

As it has been observed, the majority of foreign investments in Ukraine are directed to the Eastern regions (Table 1) and a significant part of them is from Cyprus at that. Those investments are likely directed to those industries as mining and processing, which are deepening the regional disparities of the regions not integrating them.

Table 1. Cumulative direct foreign investments to the regions up to January 2011, mln. $.

Region	Germany	Cyprus	France	Poland	Great Britain	Virgin Islands	Netherlands	Austria	Other countries	Total
Eastern	4774.2	4087.2	1454.9	30.8	583.9	473.4	783.8	126.1	1135.7	13450.0
Central	98.6	500.1	N/A	82.5	180.2	53.1	499.2	38.7	266.5	1718.9
Southern	N/A	304.8	N/A	N/A	225.1	N/A	186.7	N/A	656.2	1372.8
Western	506.4	466.1	65.2	1114.2	474.6	324.0	76.4	285.8	1990.2	5303.0
Total	5379.2	5358.2	1520.1	1227.5	1463.9	850.5	1546.1	450.6	4048.6	21844.7

Source: State Committee of Statistics of Ukraine (State Statistics Service of Ukraine, 2010).

Hypothesis 5: Regional disparities in terms of personal income differ from the same in terms of GRP

According to statistical data (Fig. 5), it can be seen, that the general dynamics of regional disparities in terms of personal income per capita and GRP per capita from 2003 to 2009 are quite identical. As it has been noticed before concerning Theil index calculated on the basis of GRP per capita, intergroup component has been increasing more dramatically than intragroup. Despite this part of hypothesis was not corroborated, another characteristic of personal income disparity has caught our attention. The rate of deepening the regional disparities in terms of personal income is lower than the rate of economic growth of Ukraine (Fig. 6). It obviously means that income disparities are not restraining economic growth as so GRP disparities do. This evidence is also corroborated comparing average elasticity of each of the disparity indices to economic growth, which is higher in case of income distribution (1.21 against 0.96 respectively).
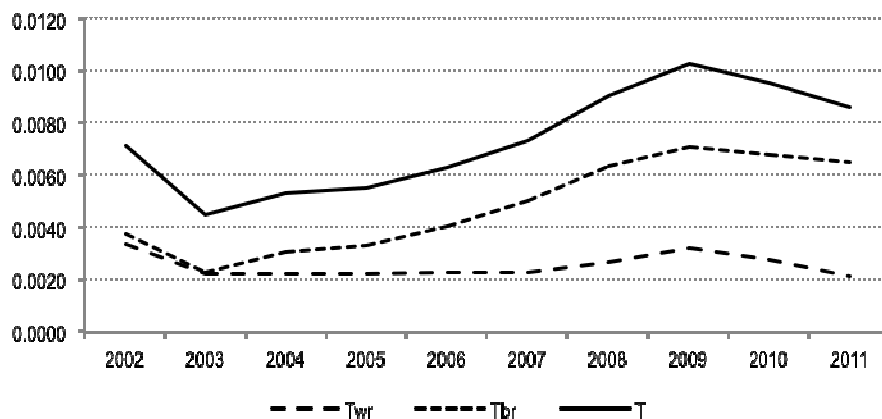
Fig. 5. Dynamics of the total, intergroup and intragroup divergence in Ukraine (in terms of personal income per capita) (Source: created by the author).
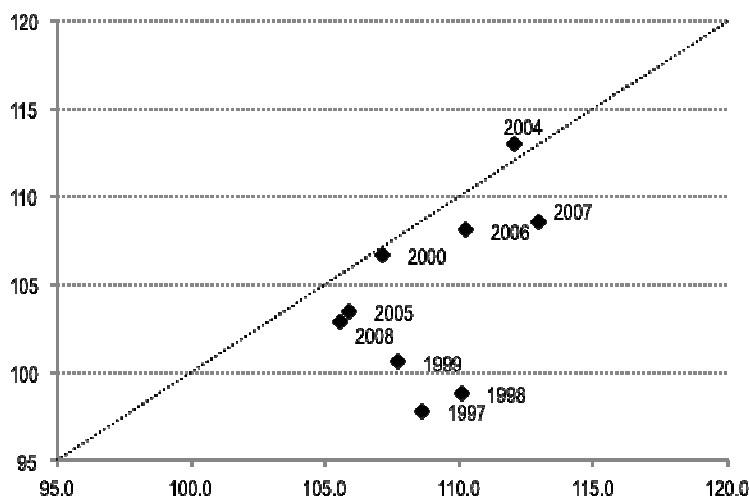
Fig. 6. Matching rates of regional desparities growth and economic development (Source: created by the author).

3. Conclusion

The range of the regional problems related to continuously deepening inequalities of socio-economic development across the states actualize scientific researches in the regional economics and demands for implementation of appropriate regional policies.

Unwanted dynamics of the regional disparities in Ukraine towards deepening are confirmed by empirical data on GRP and personal income distribution.

Regional disparities in Ukraine are exhibited in intergroup manner and are primarily caused by structural disproportions of economy, hampering interregional linkages and territorial integrity of national economy.

Territorial distribution of the foreign investments can be mentioned among other causes of deepening regional disparities in Ukraine.

The range of the factors of the regional development, causes and impacts of the regional disparities and policy implications directed against divergence of the regions in Ukraine should be considered in the further researches.

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THE IMPACT OF THE EUROPEAN REGIONAL POLICY OVER THE REGIONAL CONVERGENCE OF EASTERN EUROPEAN COUNTRIES. THE CASE OF ROMANIA

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Abstract. The main objective of the regional development policy of the European Union is to reduce disparities between European regions and growing the welfare of the citizens. The main objective is to raise the level of regional convergence in order to offer a better life for the inhabitants of Europe. The European Union spends about 40% of its budget to help poorer regions catch up with the wealthier ones. Whether this hypothesis is valid or not is our main research topic. We tried to identify whether poorer regions register convergence and manage to reduce the gap in terms of GDP/capita between them and if there is any link between the level of structural funds absorption and regional convergence. The paper focuses on the Eastern European countries that joined the European Union in the last accession wave that took place in 2004 and 2007. We used a parametric linear model in order to be able to observe the evolution of the regional convergence in the East European regions of NUTS II level, and compare it to the structural funds absorption rate. Our study focuses on Romania, a new Member State of the European Union that is struggling at present to enforce the structural funds absorption. Through the present study we try to identify whether there is a connection between regional convergence and the structural funds absorption rate. We formulated policy recommendations for Romania and Eastern European countries, in order to help it obtain better results in terms of regional convergence through strengthening the entrepreneurship potential and the importance of endogenous development.

Keywords: regional convergence, structural funds absorption, entrepreneurship potential.

JEL Classification: R11.

1. Introduction

In the actual context of economic crisis recovery, governments look for an efficient way of stimulating economic growth. At the European Union's level, authorities often stated that structural funds are a proper mean for stimulating economic growth at regional level and reducing regional disparities. The European Union spends about 40% of its budget to help poorer regions catch up with the wealthier ones through the regional development policy. In other words, structural funds are considered an efficient instrument of increasing regional convergence in order to offer a better life for the inhabitants of Europe.

According to Armstrong, the convergence of regional disparities is a complex phenomenon that refers to mechanisms through which wealth discrepancies between nations can disappear (Armstrong, 1995). From a static point of view, convergence may have different meanings regarding reducing regional disparities (Barro and Sala-i-Martin, 1991; Baumol, 1986; Bernard and Durlauf, 1996; Boldrini and Canova, 2001). More precisely, we talk about convergence as a negative relationship between income per capita and income per capita in the initial period (e.g. poor regions grow faster than initially rich areas) also convergence can be considered as the decrease of the per capita income dispersion between regions over time.

Convergence hypothesis of neoclassical economics was widely accepted in the field literature, but depends critically on two assumptions, namely (Cheshire and Carbonaro, 1995; Dewhurst and Mutis-Gaitan, 1995) reduced production of scale, which means that an increase in operating results will be a proportionate subunit in the capital increase, and that technological progress will also generate benefits that will decrease as technology development increases (which means that the results will decrease in magnitude).

In the present paper we try to identify the convergence evolution of the East European countries, EU (European Union) members as a result of accession and structural funds absorption. We try to identify whether there is any link between the rate of structural funds absorption and convergence trend. The highest level of GDP/capita from the Eastern European countries, EU members, was registered in 2008 in the Praha region, with GDP/capita 10 times higher than the poorest region from Eastern European countries and in the European Union, Severozapaden region from Bulgaria. The present paper focuses on the Eastern European countries that joined the European Union in the last accession wave in 2004 and 2007. Our study focuses on Romania, a new Member State of the European Union that is struggling those days to enforce the structural funds absorption. On the basis of the link between structural funds implementation and regional convergence, we formulate policy recommendations for Romania and Eastern European countries, in order to help them obtain better results in terms of regional convergence through strengthening the entrepreneurship potential and the importance of endogenous development.

2. Research and methodology

2.1 Methodology

In order to investigate the convergence we used the Eurostat database, regional statistics. The dataset includes 54 regions from the 10 EEC (Eastern European Countries), as they are called in the KPMG Report. We used an econometric model in order to observe the evolution of the regional convergence in the East European regions of NUTS II level, and compare it to the structural funds absorption rate. For reasons of homogeneity, we use regions at level NUTS-2 for East European countries. The resulting data provides one set of region. This set contains 54 regions covering 10 EU countries (see Table 1). The data is available over the period 2000–2009 which can be considered long enough to be appropriate to study the long-term convergence.

2.2 Background and econometric specification

As we have seen in the introduction, *the concept of convergence appoints that there are diminishing differences between the economic indicators of various countries/regions of the same geographical area*. When poorer countries/regions record an economic growth rate higher than the richest countries/regions, it means that the income differences between them are decreasing and there is a process of *real convergence*. Conversely, when the gap is experiencing a deepening of differences regarding economic growth, we are dealing with a process of *economic divergence*. The classic indicator used to measure economic convergence is the GDP / capita measured in purchasing power standards (Marinaş, 2008, p. 51).

In order to identify whether at the level of regions from Central and East Europe Countries there is convergence or divergence, we used Table 1 that presents descriptive statistics on regional GDP per capita in PPS (Purchasing Power Standards) for each country. We observe that disparities between regions around the East European average are strong. Indeed, the highest level of GDP per capita is approximately 7.76 times higher than the lowest level in 2000. In a nutshell, the highest levels of GDP per capita in 2009 are observed in Slovenia, and the lowest ones in Romania and Bulgaria.

Table 1. Descriptive statistic, 54 EU regions, 2000-2009.

Country	Number of regions	GDP per capita (in PPS)				Growth rate (%) '00-'09
		2000	Region	2009	Region	
Bulgaria	6	5.233		9.183		5,3
Czech Republic	8	13.638		19.438		4,2
Estonia	1	8.600		14.900		5,6
Latvia	1	6.900		12.000		6,2
Lithuania	1	7.500		12.800		6,2
Hungary	7	10.300		13.157		2,9
Poland	16	8.519		12.981		4,3
Romania	8	5.175		11.588		5,7
Slovenia	2	15.450		20.750		3,8
Slovakia	4	11.200		20.750		5,9
All countries	54	10.451		15.862		4,6
Minim		3.400	Nord Est	6.400	Severozapaden	1,7 (Dél-Dunántúl)
Maxim		26.400	Praha	41.800	Praha	9,8 (Bucuresti-lfov)

Source: author's calculation, using Eurostat (2011).

As we notice in Table 1, the evolution of GDP per capita between 2000 and 2009 shows *an average growth rate of 4.6%,* which means that East European Countries of European Union registered an economic growth on average of 4.6% yearly. In Latvia and Lithuania regions, growth is particularly high, they had a growth equal to 6.2 %, the highest from the 10 countries analyzed, and also in Slovakian regions the growth was high - 5.9%. In contrast Hungarian regions are characterized by small growth, 2.9%. According to our calculation, *Romania knew a growth of 5.7% on average in the 10 years analyzed, being the forth country from the Central and East European Countries.* To illustrate the concept of convergence, we also report in Table 2 the dispersion of GDP in 2000 and 2009.

Since 2007, Eurostat has calculated a new, derived indicator which records the differences between regional GDP per inhabitant and the national average, and makes them comparable between countries. This dispersion indicator is calculated at NUTS 2 and at NUTS 3 levels. The figures used by Eurostat are based on GDP in purchasing power standards (PPS).

Table 2. Dispersion of regional GDP per inhabitant, in PPS, NUTS level 2, 2000 and 2009 (1).

Year / Country	2000	2009
Bulgaria	18,1	39,6
Czech Republic	20,9	26,9
Hungary	32,5	38,3
Poland	20,6	18,3
Romania	25,1	30,4
Slovenia	16,7	18,7
Slovakia	26,8	33,2

(1) Regional dispersion is not applicable for Estonia, Ireland, Latvia, Lithuania, Luxembourg and Slovenia; Croatia, 2000 and 2009.
Source: Eurostat (2011).

If, under the neoclassical theory of diminishing returns of capital, we admit the idea that poor economies tend to grow faster than the rich ones, that is, on the one hand, a gradual reduction in the dispersion coefficient for GDP / capita ($\sigma_{t0+T} < \sigma_{t0}$), and on the other hand, there is an inverse relationship between economic growth rate of GDP / capita at a time (t_0 and t_0+T) and initial level of

GDP / capita (year t_0) (Iancu, 2009). Based on the σ indicator, there can appear three combinations in period T: converge, divergence or divergence, stationary, convergence (Table 3).

Table 3. Combinations that can occur in period T under the neoclassical theory of diminishing returns of capital.

1	2	3
$\sigma_{t_0+T} < \sigma_{t_0}$	$\sigma_{t_0+T} > \sigma_{t_0}$	$\sigma_{t_0+T} < \sigma_{t_0}$ or $\sigma_{t_0+T} > \sigma_{t_0}$
Convergence	Divergence	Divergence, stationary, convergence
The decrease of the difference between the development levels of regional or national economies within the period T	The increase of the difference between the development levels of regional or national economies within the period T	Within the period, T can vary successively from decrease to increase of the difference between the development levels of regional or national economies

Source: Iancu (2007, p. 34).

From Table 2 and Table 3 we conclude that the divergence between the regions analyzed is present in most countries examined, except for Poland.

Although disputed by some economists as irrelevant to the real convergence process of growth, the concept of beta convergence still imposed itself in the economic literature (Boyle and McCarthy, 1997). It became even indispensable tool for calculation and econometric analysis and description of this process when it is taken either in its early simple form to either in its developed form (Iancu, 2009):

$$\frac{1}{T}\log\left(\frac{y_{i,t_0+T}}{y_{i,t_0}}\right) = a - \left(\frac{1-e^{-\beta T}}{T}\right)\log(y_{i,t_0}) + \varepsilon_{i,t_0,t_0+T} \tag{1}$$

The poor economies tendency to *catch up the wealthy economies* is reflected by both the decrease the dispersion of GDP / capita of the region and the negative sign of β convergence annual rate of GDP / capita of the sample regions, reaching at the same time at steady state. Negative sign of the parameter β is the expression of inverse relationship between the average annual increase in GDP / capita for the period T and the initial level of GDP / capita in the year t_0 (e.g. when the rich grow faster than the poor) (de la Fuente, 2002).

2.3 Testing the convergent tendency of the regions of Central and East European countries

Using the empirical methods, we test the hypothesis of β convergence. But given the controversy around this indicator, we take as the sample analyzed 54 regions of Eastern European countries, extending the data series regarding the rhythm of annual average growth rates in 10 years (2000-2009) and taking into account the initial value of GDP / capita in 2000. To ensure comparability between regions, we chose to express the GDP / capita in PPS for all regions considered. For the calculation of regression equation (1), were used annual average growth rates of GDP / capita and the level of GDP / capita in the 54 regions, expressed in PPS in the Eurostat statistics. To see how the two indicators correlate the regression equation, we built the graph in Fig. 1, where on the ordinate were noted annual average growth rates during 2000-2009, and on the abscissa initial levels of GDP / capita of countries (in year 2000).
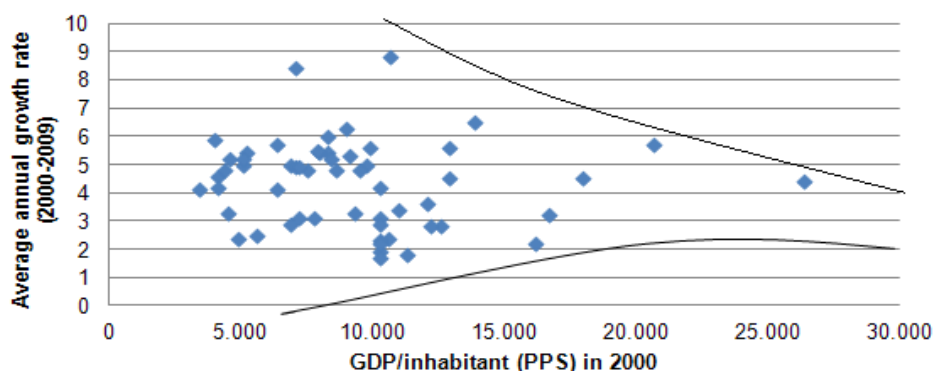
Fig. 1. The annual growth average rate of GDP (in the period 2000-2009) and the initial level of regional development of regions in Eastern European countries (Source: elaborated by the authors on the basis of Eurostat,2011).

Points formed at the intersections of the two categories of dispersion are difficult to define. They are not in the expected trend of neoclassical theory hypothesis on poor countries achieving higher growth rates than the rich ones (Kumo, 2011). Data analysis showed a reverse to that expected. From the regression calculations made in Table 3, line 1, we can see that the coefficient β result of the initial explanatory variable with a positive sign. The sign shows no signal of any convergence trend of economies considered, which can be observed directly, by the way the 54 points are distributed in the graph in Fig. 1. Moreover, the result is not surprising if we consider the very large gap between rich and poor countries, as regards the presence of economic growth factors, the ability to generate higher economic growth rates and the capacity of rich economies to absorb foreign direct investment and to generate and absorb new technologies and support innovative entrepreneurship (Iancu, 2009).

2.4 Testing the convergent tendency within regions in homogenous economies

If, on the whole regions considered, it occurs the incapacity to achieve convergence, the convergence can still be done between regions in the homogeneous groups of economies, the economic structure, technological and institutional or closely similar. In the following we try to identify if the impossibility of accomplishing convergence is retained in the inner regions of a country, we want to identify the state of the art, especially in Romania. Data for regions in each country regarding the average annual growth rates during 2000-2009, and the initial level of regional GDP / capita in 2000 are taken from statistics provided by Eurostat. Based on these data were drawn graphs in Fig. 2, 3 and 4, which emphasize for three countries, namely Romania, Czech Republic and Poland the distribution of the points and the trends described by calculated curves outlined in the respective charts. We picked those three countries as they have the highest number of regions so as to obtain a relevant result. Also, using the same data and equation (1), were calculated for each country, the coefficient β of explanatory variable (the initial level of regional GDP / capita in 2000), as well as the other parameters. This coefficient defines the convergence indicator beta.

Romania
The first country analyzed is Romania, a country containing 8 development regions that managed to register a slight growth and surpass Bulgaria. In 2000 North-East region of Romania was the poorest in the European Union and in 2008 the regional GDP per capita increased to 29% in the North East region of Romania, surpassing Severozapaden – a region of Bulgaria, with 28%, which is now the poorest of the EU regions (Dodescu, 2011).
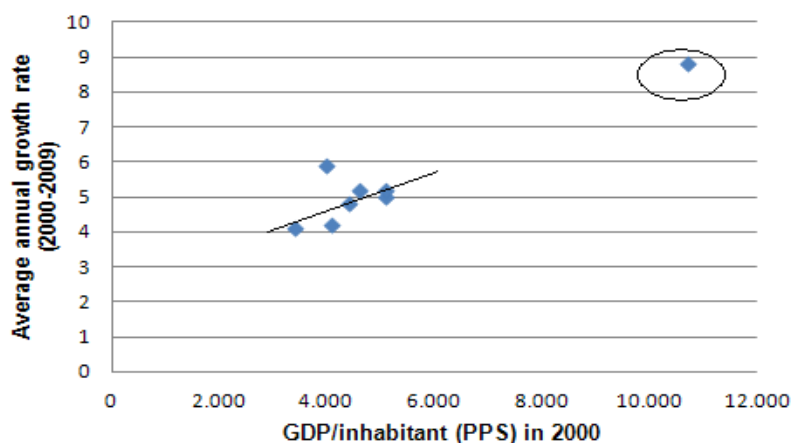
Fig. 2. The annual average growth rate of GDP per capita (in the period 2000-2009) and the initial level of development in Romania (Source: author's contribution on the basis of Eurostat, 2011).

If we analyze Fig. 2, we notice that the general tendency between Romanian regions is of divergence. This phenomenon is given by the big discrepancy between the Bucharest-Ilfov region that is the richest region in Romania, having a GDP per capita 4 times higher than North-East region, the poorest in Romania. Though, if we ignore Bucharest-Ilfov region, we notice that the points are distribute quite homogenous and we may say that there is a convergence tendency on the other 7 regions, except from the Bucharest-Ilfov region that determines the divergence tendency.

Czech Republic
The Czech Republic has also 8 regions of NUTS II level, and, analyzing Fig. 3, we notice the same tendency that was identified in the case of Romania. In 2000, the richest region in Czech Republic was Praha region, with a GDP per capita twice and a half higher than GDP per capita in the poorest region, Moravskoslezsko. Strední Cechy region registers a higher growth rate in the period analyzed (over 5%), but still doesn't cross the 15.000 euro GDP per capita. Also, if we isolate Praha region, we notice that there is a convergence trend between the other regions of Czech Republic.
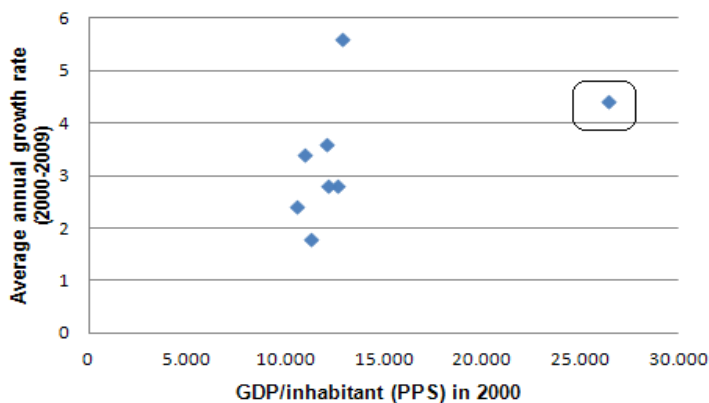
Fig. 3. The annual average growth rate of GDP per capita (in the period 2000-2009) and the initial level of development in Czech Republic (Source: author's contribution on the basis of Eurostat, 2011).

Poland
Poland is the biggest country that joined EU in 2004, has 16 development regions of NUTS II level. Like in the other cases, we notice a divergence tendency determined by Mazowieckie region, containing the capital city of Poland. Again, if we ignore this region, we notice a convergent tendency between the others.

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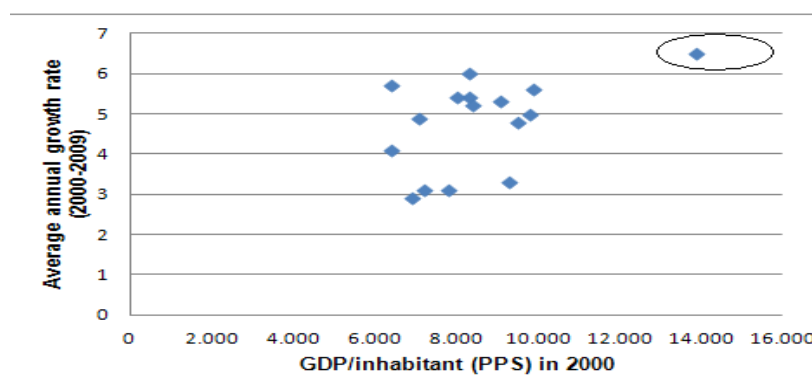
Fig. 4. The annual average growth rate of GDP per capita (in the period 2000-2009) and the initial level of development in Poland (Source: author's contribution on the basis of Eurostat, 2011).

In Table 4 we calculated the regression per total and for the 7 countries analyzed per regions, in order to be able to identify the general trend and the national trend regarding convergence or divergence at regional level.

Table 4. Result of regression calculus per total and for countries per regions.

Parametrii / Regiuni		Coeficient β	Constanta	R-squared	T pentru β	Standar error
All regions	1	0,106	2,37	0,016	0,94	0,11
Bulgaria (6 regions)	2	1,2	-8,95	0,22	1,08	1,11
Czech Repuplic (8 regions)	3	0,59	-4,43	0,23	1,36	0,4
Hungary (7 regions)	4	0,56	-4,41	0,38	1,58	0,35
Poland (16 regions)	5	0,37	-1,66	0,51	2,06	0,17
Romania (8 regions)	6	0,62	-3,6	0,7	4,88	1,12
Slovakia (4 regions)	7	0,069	1,07	0,10	0,48	0,14

Source: author's contribution on the basis of Eurostat (2011).

The β indicator, as well as other estimated parameters is presented in Table 4. Starting from the parameters determined with the help of the econometric model above, we notice that in all 7 cases analyzed, for which a study of the convergence / divergence tendency between national regions was relevant as they have more than one region inside the national territory, resulted a β coefficient of the initial explicative variable positive. The positive sign of the β coefficient shows us a divergence tendency at the level of all regions of the 7 countries observed in Table 3. Extrapolating from the 3 cases studied above, and on the basis of Table 3, we notice a general tendency of divergence due to the region containing the capital city of the countries, regions that are generally more attractive for investors and entrepreneurs and manage to attract more funds.

3. The link between economic growth, regional convergence and EU's regional policy

To check the efficiency of allocation and use of money, the European Commission has ordered a performance audit report that was carried out by KPMG. According to the Progress Report for 2007-2010, entitled *EU Funds in Central and Eastern Europe,* in 2007-2013 Central and Eastern European states should spend 208.2 billion euros (together with national contributions) for the growth of economic and social cohesion. In the first four years of implementation beneficiaries have signed

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contracts totaling nearly EUR 110.2 billion, almost half of the amount planned for 2007-2013. As regards payments at the end of 2010 more than a third of contracted funds were paid to beneficiaries, as shown in Fig. 1. Analyzing the data, we notice that from the Central and Eastern European (CEE) countries, Romania is the second smallest in terms of structural funds contraction rate (45%) followed by Bulgaria (37%), while taking into account payments rate we see that we are the last ones (7%), being overtaken by countries like Bulgaria (10%), Hungary and Poland (16%), and so on.

If we analyse Table 1 and Table 5, we notice that the countries that registered the highest rate of contracted and payment ratio, namely Latvia and Lithuania (76% and 68% in terms of contracted ratio and 30% and 29% in terms of payment ratio) are also the countries that registered the highest average of economic growth in the period 2000-2009 (6.2%). Surprisingly, Romania and Bulgaria, the countries with the lowest contracted and payment ratio out of the East European countries register high average of economic growth in the analysed period. We assume that the explanation is that they managed to attract other sources of investment, more expensive, that include debts and interests, like is the case of Romania that accessed a loan from IMF (International Monetary Fund). However, as they are so far behind the other countries regarding the level of economic development, the economic growth rates are not big enough for catching up the other wealthy countries like is the case of Slovakia and, Slovenia that already adopted euro as national currency. We conclude that we can identify a link between the level of contracted and payment European funds and annual economic growth average, as except from Romania and Bulgaria all the other 8 countries tend to respect the hierarchy identified in Table 5 and in Table 1.

Table 5. Implementation of Structural Funds in Central and Eastern European states during 2007-2010.

Basic CEE information on implementation 2007-2010

	Bulgaria	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Slovenia	CEE total
Available budget 2007-2013 (bilion EUR)	8.0	31.0	4.1	29.3	5.0	7.3	82.1	23.3	13.4	4.8	208.2
Available budget 2007-2013 /capita(EUR)	1,044	3,009	3,035	2,913	2,172	2,161	2,53	1,078	2,490	2,400	2,039
Contracted grants 2007-2013 (bilion EUR)	3.0	17.2	2.5	15.0	3.7	5.0	43.5	10.4	7.6	2.3	110.2
Contracted grants 2007-2013/capita*(EUR)	391	1,669	1,835	1,493	1,643	1,469	1,142	481	1,409	1,144	1,079
Paid grants 2007-2013 (bilion EUR)	0.8	8.1	0.9	4.8	1.5	2.1	13.1	1.5	2.3	1.3	36.3
Paid grants 2007-2013/capita*(EUR)	103	788	635	478	644	629	344	71	418	644	356
Contracted ratio	37%	55%	60%	51%	76%	68%	53%	45%	57%	48%	53%
Payment ratio	10%	26%	21%	16%	30%	29%	16%	7%	17%	27%	17%

*based on EUROSTAT data 2010
Source: EU Funds in Central and Eastern Europe - Progress report 2007-2010 (2011, p. 8).

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4. Conclusions and discussions

The results of our research are in accordance with the expectancies, namely we noted that the general tendency of the regions in East Europe, is of divergence, a process that is defined through deepening the development discrepancies between regions. We expected it because it is known that most of the former communist countries, like is the case of Romania, knew a *general trend of increasing regional disparities* regarding employment, industrial production, investments and income, between West-East and centre-periphery; and highlighted the *central-peripheral type of regional structure* and the acceleration of the *growth and economic development direction from West to East* after joining the European Union (Dodescu, 2011; National Institute of Statistics, Romania 2011). This is a phenomenon that regional development policy fights and tries to diminish the discrepancies between the center and periphery, between East and West. Even if it seems strange, because the discrepancies have widened after joining EU, with the help of regional development policy of European Union, growth is taken to less developed regions through measures taken to support entrepreneurs: financing business agglomerations creation such as clusters, business incubators and industrial parks, an instrument of growing endogenous innovative entrepreneurship and a manner of raising exports of regions.

In conclusion, favorable geographical position, dynamic business environment, entrepreneurial mentality and capacity to attract foreign direct investments and EU structural funds make the difference between developed and underdeveloped regions. As we concluded in the taken analyze, there is a direct link between structural funds absorption and economic development, European funds are irredeemable source of investment in innovation, entrepreneurship, infrastructure and so on, that help economies develop. This is the reason why authorities should focus on structural funds absorption and raising the payment ration, which is very low in Romania, in order to help wealth spread from center to periphery in accordance to EU regional's policy objectives. As it is known, in order to have a competitive region, we have to offer high living standards through incomes, work places, social care and environment protection. In our opinion, the instrument that should be used in order to facilitate Foreign Direct Investments and encourage entrepreneurship in development regions is innovative industrial facilities such as industrial parks, business incubators, clusters where the price of land is law, local taxes are exempted and infrastructure and utilities are provided. This would help regions be convergent and would determine entrepreneurs who tend to locate in regions that contain the capital city of a state to locate in poor regions where they can benefit from law costs of land, labor force, and local taxes and have access to infrastructure facilities. In the case of Romania, which is one of the poorest EU countries, we recommend government to take the measures highlighted above to attract entrepreneurs to less developed regions. In this way the discrepancies between regions would decrease, the region would know an economic growth and the tendency of the regions would be of convergence.

5. Acknowledgement

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COMPETITIVENESS OF THE VISEGRAD GROUP COUNTRIES

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Abstract. Nowadays competitiveness becomes the means and simultaneously the sub-target for achieving the main objectives of economic policy. Ultimately competitiveness growth in living standards and well-being of citizens raises. Since 2005 the World Economic Forum has used to review and measure national competitiveness by the Global Competitiveness Index (GCI), the weighted index of approximately hundred different criteria, that are grouped into twelve pillars of competitiveness. The aim of this paper is to evaluate the national competitiveness of the Visegrad Group (V4), i.e. the Czech Republic, Hungary, Poland and the Slovak Republic, between years 2008 - 2011. According to the GCI 2011-2012 the Czech Republic has the most competitive economy, followed by Poland, Hungary and the Slovak Republic.

Keywords: competitiveness, Global Competitiveness Index, Visegrad Group, World Economic Forum.

JEL Classification: O5.

1. Introduction

There are deepening globalization trends typical for contemporary world which bring continuous development and use of information-communication technologies, concentration of production, removal of barriers and release of foreign trade and linking industrial and financial markets. All these processes become new challenges for individual businesses and economy. If they want to succeed in the fierce competitive struggle, they have to response to the coming changes appropriately and in time.

Experts began to deal with the issue of competitiveness in the 1970´s. One of the impulses to the scientific research in this area was a significant growth of Japanese economy in the 1970´s and 1980´s. Experts from the United States, but also some experts from developed countries of Europe dealt with revealing the secret of the Japanese success. The issue of competitiveness can be analyzed at three levels, namely, at the macroeconomic level (national), mezzo level (regional or sectoral) and microeconomic level (enterprise). For all these types of competitiveness there are two basic prerequisites for achieving a competitive position – achieve low cost and obtaining competitive position based on qualitative competitiveness. The greatest consensus exists among experts in defining competitiveness at the microeconomic level. In terms of enterprise competitiveness we assess the ability of an enterprise to succeed in the competitive environment of other enterprises. According to Klvačová and Malý (2008) *enterprise is considered to be competitive if it is able to remain on the market and it is possible to increase its market share. It must be able to meet its obligations to its surroundings: pay wages to its employees, pay dividends to the shareholders, pay taxes to the state properly, repay the loan to the banks, pay suppliers for raw materials, materials, semi-finished products, machinery and equipment*. The main instruments used to achieve the competitiveness of enterprises are various strategic and operational measures that respond to developments in the market. Defining the national or regional competitiveness is more complicated. If we proceed from the assumption that an enterprise which is not competitive goes out of the market or is pushed out of the market, then we cannot apply this criterion of survival at the national or regional level, because even though the competitiveness of countries or regions is reduced, they do not fade away, but they are still there. We also cannot rely on the assumption that national and regional competitiveness is expressed as a simple aggregation of the competitiveness of enterprises in the territory, respectively that the competitiveness of countries and regions is derived from the competitiveness of their enterprises. The determination of national (regional) competitiveness results

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from selected evaluation criteria which declare how a country (region) can succeed in competition with other countries, respectively regions. The selection of individual evaluation criteria of competitiveness can lead to different conclusions and only the evaluators (experts, institutions) decide, which pointers they include to the file.

The aim of this paper is to evaluate national competitiveness of the Visegrad Group (V4), i.e. the Czech Republic, Hungary, Poland and the Slovak Republic according to the Global Competitiveness Index (GCI). The data from the survey of the World Economic Forum (WEF), which annually publishes The Global Competitiveness Report, are used to achieve the aim. As the methodology of creating global competitiveness index has been developed and changed over time, in this paper the data from 2008 are used. In the following part of the paper, the selected definitions of national competitiveness are introduced (the author does not attempt to cover all the aspects of defining the national competitiveness, it is primarily a list of key findings) as well as the approaches of evaluating the national competitiveness of two selected international institutions. The third part of the paper is devoted to the evaluation of competitiveness of the Visegrad Group between the years 2008 - 2011, and the last part of the paper summarizes the most important findings of the examined issue.

2. National Competitiveness

As it has already been mentioned, it is a difficult task to define the term national competitiveness. In that field of studies there is currently no clear consensus among experts about what to imagine by this term exactly. Verner (2011) states that *the easiest way is to define competitiveness between economies in terms of export performance: the more production a country exports, the more competitive it is*. However, as he pointed out, this definition is not ideal, because the importance of exports for individual economies may vary, as it is influenced by the economy as well as by its degree of openness.

Tyson (1992) expressed her opinion towards the issue of national competitiveness as follows: *Our economic competitiveness is our ability to produce goods and services that meet the test of international markets while our citizens enjoy a standard of living that is both rising and sustainable*. From that point of view competitiveness at the national level can be defined as the ability of economy to penetrate its specific products and services into the world markets, to succeed in, to gain advantages from international exchange and to create conditions for long-term growth. In the broader concept Kucharčíková et al. (2011) also define competitiveness as a *set of tools to promote productivity growth and sustainable economic growth and as a country's ability to adapt to the structural changes in the world*. There are many further definitions of national competitiveness, but how Beneš (2006) states we distinguish three main streams of definitions of national competitiveness:

a) external approach - national competitiveness is evaluated only by the export performance of the country, respectively by the ability of the economy to achieve good results in international markets. *The economy is competitive if its goods and services are successful abroad and domestically*. Evaluation criteria might be indicators of the volume of exports and imports, indexes of comparative advantage and power balance.

b) aggregate approach - national competitiveness is evaluated from the point of view of economic performance. This concept says that *economy, which boasts the kind of positive trajectories based on the main macroeconomic indicators such as GDP growth, living standards and employment, could be considered as competitive*.

c) wider approach - national competitiveness is evaluated through individual determinants of economic development and their mutual relations. The evaluation also includes aspects such as quality of life and the attractiveness of the country. *Determinants of the economic development are the ability of domestic enterprises to sell their products in the markets, the value of these products and the efficiency of their production and last but not least, the degree of utilization of domestic capital*

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(including human capital) and natural resources. Competitiveness is a complex function of the relationships between these determinants.

Not only experts from academic circles deal with measurement and evaluation of national competitiveness. We can say that examination of competitiveness at the national level is becoming institutionalized, because various councils (centers) for the evaluation of competitiveness have been founded. Their main task is to analyze competitiveness of the domestic economy and the integration bloc. Their findings are then published and can be used as a recommendation for the creators of the economic policy of certain economy or integration bloc. The most important institutions dealing with assessments of the competitiveness of countries are the World Economic Forum (WEF) and the Institute for Management and Development (IMD).

Since 1989 IMD has been annually publishing the World Competitiveness Yearbook, which at present (IMD, 2012) evaluates the competitiveness of 59 countries based on 329 criteria. From the given criteria approximately two thirds represent hard statistical data, which are obtained from international or national databases, and which can therefore be objectively measured, it means they are quantifiable. One third of the criteria are soft data or information obtained from the executive opinion survey. Soft data represent such elements of competitiveness evaluation that reveal information about its quality site. Total multi-criteria evaluation of the national competitiveness by IMD is divided into four main categories - economic performance, government efficiency, business efficiency and infrastructure. These groups are subdivided into twenty subgroups, which include all 329 benchmarks.

For the purposes of this paper, the evaluation of national competitiveness according to the WEF is used. WEF has been dealing with the assessment of competitiveness since 1979 and has also been publishing The Global Competitiveness Report, which describes the level of competitiveness of individual economies.

2.1 The Global Competitiveness Index

Since 2005 WEF has been using the Global Competitiveness Index (GCI) to evaluate and measure national competitiveness. WEF (2011) defines competitiveness as *the set of institutions, policies, and factors that determine the level of productivity of a country*. As there is a plenty of determinants that affect the productivity of economy and thus its competitiveness, GCI is defined as the weighted index of approximately 110 different criteria. The individual criteria are then grouped into 12 pillars of competitiveness, which are made up of three sub-indices which create the value of GCI. GCI pillars are as follows:

1. Institutions,
2. Infrastructure,
3. Macroeconomic environment,
4. Health and primary education,
5. Higher education and training,
6. Goods market efficiency,
7. Labor market efficiency,
8. Financial market development,
9. Technological readiness,
10. Market size,
11. Business sophistication,
12. Innovation.

The first four pillars are included in the sub-index "basic requirements", pillars five to ten make up sub-index "efficiency enhancers", and the last two pillars represent the sub-index "innovation and sophistication factors". As well as in the approach of IMD, WEF uses hard statistical data for evaluation of competitiveness, which are obtained from international or national databases, i.e. data

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that can be objectively quantified. The other part of the criteria is soft data, i.e. data that cannot be precisely quantified, but can be validated by respondents through the questionnaire, which WEF realizes for this purpose. GCI, as well as its individual pillars can reach values in the range from 1 (which expresses the lowest degree of competitiveness) to 7 (the highest degree of competitiveness).

Within the last evaluation of national competitiveness (WEF, 2011) 142 countries around the world were examined. The most competitive economy (see Appendix, Table 1) according to the index GCI 2011-2012 can be found in Switzerland (in the first position was for three consecutive years), followed by Singapore and Sweden (in the previous year the order of these two countries was reversed). If we focus on partial evaluation of the competitiveness of economies, i.e. by pillars: in case of the 1st pillar the top positions are occupied by the countries such as Singapore, Sweden, New Zealand, Denmark and Finland. The evaluation of this pillar is particularly based on the subjective evaluation of selected experts of each country, since it involves mostly soft data. The most competitive countries in the area of infrastructure are Hong Kong, Germany and Singapore. The best results in the evaluation of the macroeconomic environment (based on hard statistical data) were reached by Brunei, Kuwait and Oman and in the area of health and primary education Finland, Belgium and Singapore are the leaders. The high degree of competitiveness in the area of higher education and training is maintained by the Nordic countries and Switzerland, goods market efficiency is best evaluated in Singapore, Luxembourg and Hong Kong (they are stable in the top positions), as well as Singapore and Hong Kong, together with Switzerland are highly competitive in the area of labor market efficiency. The first places in the evaluation of competitiveness in relation to development of financial market are occupied by Singapore and Hong Kong, as well as Malaysia, or Australia and New Zealand. High technological readiness can be found in Switzerland, Sweden and Iceland. Evaluation of the market size is based on the given territorial statistical data, so it is not surprising that the top positions are reached by the United States, China and India, or Japan. Business sophistication is highly valued by experts from Japan, Sweden, Switzerland and Germany. In the last of the pillars the most competitive countries are Switzerland, Sweden, Finland and the United States. What the situation in the Czech Republic, Hungary, Poland and the Slovak Republic is like, respectively how competitive these countries are, is analyzed in the following part of the paper.

3. Competitiveness of the Visegrad Group Countries

As it has already been stated, the overall evaluation of national competitiveness according to the WEF is based on evaluation of 12 partial pillars. In this section we focus on the evaluation of competitiveness of the Visegrad group countries via the GCI, respectively its individual pillars. The position of the V4 countries in evaluation of competitiveness via GCI from 2008 to 2011, and 2012, is captured in Fig. 1. Within the period examined, the Czech Republic had the best position of those four countries, i.e. from these four economies the Czech Republic is the most competitive according to global competitiveness index. In 2008 and 2009 Hungary was the least competitive country, in 2010 and 2011 it was the Slovak Republic. Fig. 1 shows that Hungary was improving its position every year. From the 62nd position in 2008 Hungary managed to reach the 48th position in 2011, i.e. it improved its position in 14 rates. Poland became more competitive according to the index too, from the 53rd position in 2008 it got to the 39th in 2010 and the 41st in 2011. The Czech Republic, which achieved the best result in 2009 (31st position), outraged in the following years and moved in 7 positions below to the 38th position in 2011. The Slovak Republic shows the decreasing trend in competitiveness evaluation, it moved 23 positions below (from the 46th in 2008 to 69th in 2011) and became the least competitive economy of these four countries. Fig. 2 to Fig. 5 show how the overall evaluation of national competitiveness influence individual pillars. The results of evaluation among all V4 countries are the worst in the twelfth pillar (innovation), although it does not mean that the

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countries rank at the last positions; for example the Czech Republic is situated in the 25th – 32nd position, the Slovak Republic the 53rd – 71st position. The second pillar in which the V4 countries got the least points, is the first pillar (institutions) for the Czech Republic, Hungary and the Slovak Republic, for Poland it is the second pillar - infrastructure. On the contrary the pillar with the highest scores in the V4 is the fourth pillar - health and primary education. Now we will analyze the pillars in more details.
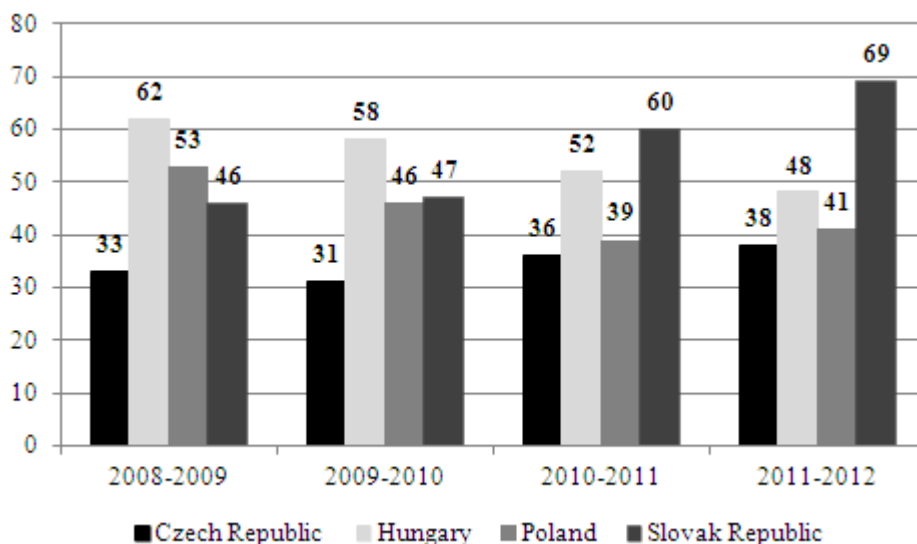
Fig. 1. Rating of competitiveness of the V4 counties according to the Global Competitiveness Index
(Source: WEF 2008, 2009, 2010, 2011).

Within the evaluation of competitiveness of the V4 via the first pillar (institutions) according to the GCI 2011-2012 the best results were achieved by Poland (52nd position), followed by Hungary (73rd), the Czech Republic (84th) and finally the Slovak Republic (101st). Only Poland has annually improved its position within this pillar in the period examined (in 2008 it was the 88th). In contrast, Hungary, the Czech Republic and the Slovak Republic got worse, most considerably the Slovak Republic, which fell from the 73rd position in 2008 to the 101st position in 2011. Criteria of evaluation of this pillar are mostly based on WEF's survey. Public trust of politicians, favoritism in decisions of government officials or the efficiency of legal framework in settling disputes were evaluated by experts from Slovakia as the worst. The Czech Republic is doing likewise with the public trust of politicians and it stands at the 134th position, Hungary occupied the 130th position. A negative phenomenon reducing competitiveness of institutions in the Czech Republic is a diversion of public funds or favoritism in decisions of government officials.

Within the period examined, the competitiveness of the V4 countries in the field of infrastructure improved in all cases, i.e. in all economies. In 2011 the most competitive in this pillar was the Czech Republic (36th position), followed by Hungary (46th position), the Slovak Republic (57th) and Poland (74th). Although Poland was in the last position (in comparison with other V4 countries), it achieved the most prominent progress in comparison to years 2008 and 2011, because it improved in 22 positions (in 2008 it was in the 96th). The position of the Czech Republic was changed in 14 rates, Hungary in 11 rates and the Slovak Republic in 7 rates. The quality of railroad infrastructure (22nd, 23rd and 40th position) and the quality of electricity supply (18th, 27th and 37th position) was positively evaluated in case of the Czech Republic, the Slovak Republic and Hungary, in case of Poland the competitiveness of that kind of field is increased due to a number of mobile telephones and fixed telephone lines per one hundred inhabitants. The quality of roads is negatively evaluated in the Czech Republic and in Poland (134th position), in the Slovak Republic it is the quality of air transport

infrastructure (128th position) and in Hungary the quality of port infrastructure which gains low evaluation.

As far as the evaluation of competitiveness in the field of macroeconomic environment is concerned, huge differences are found among the V4 countries. According to GCI 2011-2012 the Czech Republic achieved the best position (43rd). In contrast to 2008, the Czech Republic became worse in just 1 rate, but in 2010 it moved to the 48th position. The Slovak Republic achieved the second best position in 2011 (56th place), which deteriorated in contrast to 2008, resp. 2010 in 7 rates, respectively 24 positions (in 2008 Slovakia was the 49th, in 2010 it was the 32nd). If regards the macroeconomic field of studies, Hungary is in the third position among the V4 countries, but it markedly approached the more competitive economies – namely in 48 rates i.e. it moved from 115th position in 2008 to the 67th position in 2011. Poland deteriorated from its 50th position in 2008 to the 74th position in 2011. In this case the evaluation derived from the objective statistic data, the development of which is not stable, is obvious.

 The last pillar included in sub-index basic requirements is represented by the area of health and primary education. In 2011 the most competitive country was Poland (40th position), the second was the Slovak Republic (43rd place), the third was the Czech Republic (51st) and Hungary was the last (54th) of the V4 countries. In comparison to 2008 Slovakia improved its position in 1 rate, in contrast to Poland which became worse in 1 rate, Hungary got worse in 5 rates and the Czech Republic in 22 rates (the Czech Republic was the best in 2008 of the V4 countries when it reached 29th position). The achievements of the V4 countries regarding the area of health and primary education are influenced by the fact that there are no malaria cases in these countries, that the percentage of HIV prevalence is low (0,1 % and less among the adults), and the number of patients suffering from tuberculosis is low. The low percentage of primary education enrollment in Hungary and the Czech Republic is evaluated negatively (in 2011 Hungary reached the 98th position, the Czech Republic the 101st).

Efficiency enhancers represent the criteria included in pillars 5-10. According to GCI 2011-2012 regarding the fifth pillar – higher education and training – the Czech Republic is the most competitive country among the V4 as it reached the 30th position, followed by Poland (31st position), then Hungary (45th) and the Slovak Republic (53rd). The position was improved only in case of Poland (in 2008 it was 34th), but the Czech Republic and Hungary deteriorated their positions in 5 rates (in 2008 the Czech Republic reached the 25th position, Hungary reached the 40th) and the Slovak Republic   in 8 rates (in 2008 Slovakia reached the 45th position). The criteria included in the pillar are for example secondary education enrollment, tertiary education enrollment, if regards soft data, quality of the educational system, internet access at schools and the extent of staff training. The competitiveness of all the V4 countries is negatively evaluated concerning the quality of management at schools, the Slovak Republic and Hungary are negatively evaluated for the quality of their educational systems, and Hungary also for the extent of staff training. By contrast the enrollment of students is appreciated in Hungary and Poland. In all of the V4 countries the internet access at schools and the availability of research and training services is evaluated positively.

The sixth and eighth pillar is related to the evaluation of effectiveness of the market, namely goods market, labor market and financial market. As regards goods market, the least competitive country is Hungary (in 2011 it reached the 66th position), followed by Poland (52nd position), then the Slovak Republic (51st) and the best of the V4 countries is the Czech Republic (36th position). The development of the V4 countries regarding the sixth pillar is fluctuating. The Slovak Republic deteriorated its position in 16 rates (in 2008 it was the 35th), on the other hand Poland got better in 7 rates (in 2008 it was the 65th). The sixth pillar includes 16 indexes comprising mainly soft data. Hard data involve total tax rate, imports as a percentage of gross domestic product and a number of days to start a business. All the countries are positively evaluated regarding the trade tariffs, unlike

the indexes evaluating the extent and effect of taxation (Poland 107th position, Hungary 131st), buyer sophistication (Hungary 108th position, the Slovak Republic 122nd) and total tax rate (in 2011 the Slovak Republic reached the 103rd position, the Czech Republic the 104th). As regards the evaluation of effectiveness of labor market, the Czech Republic reached the best result (42nd position), then Poland and the Slovak Republic (58th, 59th position) and the last was Hungary (63rd). In spite of the fact that Hungary was the last of the V4 countries in 2011, it markedly improved its position during the period examined – in 20 rates. On the other hand the Slovak Republic deteriorated its position in 30 rates (in 2009 it was the 29th), the Czech Republic in 22 rates (in 2009 it reached the 20th position). Regarding the Slovak Republic and Poland it was the cooperation in labor-employer relations, hiring and firing practices and so-called brain drain, which were evaluated negatively. Brain drain is a problem in Hungary as well. The most positive evaluation differs among the countries. Regarding the Czech and the Slovak Republic pay and productivity gets the most positive evaluation, regarding Poland it is redundancy costs, and in Hungary it is the flexibility of wage determination. Concerning the market trends, the most competitive is Poland (34th position in 2011), followed by the Slovak Republic (47th position), the Czech Republic (53rd) and Hungary (63rd) according to the latest GCI. The improvement of the position of Poland was the most remarkable (in 2008 it was in the 68th position and it was the worst of the V4 countries). The first was the Slovak Republic (31st position), the second was the Czech Republic (47th position) and the third was Hungary (61st position) in 2008. On the other hand the Slovak republic deteriorated the most. As regards market trends, the soundness of banks, availability of financial services and the ease of access to loans is evaluated.

The ninth pillar (technological readiness) includes six criteria, namely the availability of latest technologies, firm-level technology absorption, FDI and technology transfer, and the following three criteria involve the access to the internet. Concerning this pillar it was the Czech Republic which reached the best position (31st), next was Hungary (36th position), followed by the Slovak Republic (47th) and the last was Poland (48th). The order of countries in this pillar is relatively stable. Poland reached the worst result as regards the firm-level technology absorption (100th position). FDI was evaluated the most positively among the V4 countries.

The last item of efficiency enhancers (market size) comprises only 2 indexes, namely domestic market size index and foreign market size index. From that point of view, the most competitive of the V4 countries is Poland (stable position about 20th place), followed by the Czech Republic (in 2011 in the 40th position), Hungary (52nd position in 2011) and the Slovak Republic (58th position).

The eleventh pillar (business sophistication) has been included in sub-index innovation and sophistication factors. It evaluates for example local supplier quantity or local supplier quality, state of cluster development, extent of marketing etc. The least competitive in that field is Hungary (69th position in 2011), the Slovak Republic (63rd position), Poland (60th position) and the best is the Czech Republic (36th position). The Slovak Republic deteriorated its position the most during the period examined (in 10 rates, in 2008 it was in the 53rd position), and also the Czech Republic (in 2008 it was in the 29th position).

Innovation is the last pillar evaluating competitiveness. The Czech Republic reached the best position regarding this field (33rd position), followed by Hungary (34th position), next was Poland (58th) and the worst was the Slovak Republic (the 96th position). Although in 2008 the Slovak Republic reached the 58th position and then deteriorated rapidly. The Czech Republic deteriorated in 8 positions (in 2008 it was the 25th) unlike Poland and Hungary, which fixed their positions. Hungary is positively evaluated in the field of quality of scientific research institutions, university - industry collaboration in R & D and in the area of availability of scientists and engineers. The Slovak Republic is positively evaluated regarding the utility patents granted, the Czech Republic is appreciated for the capacity for innovation, quality of scientific research institutions and company spending on R & D.

As it has been obvious form the above mentioned analysis, Global Competitiveness Index comprises the wide range of fields that can support national competitiveness. It is obvious from the

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evaluation of the V4 countries that each of the countries has its strong points and weak points and it is not a matter of fact that the success of a country in one year will be repeated in the future.
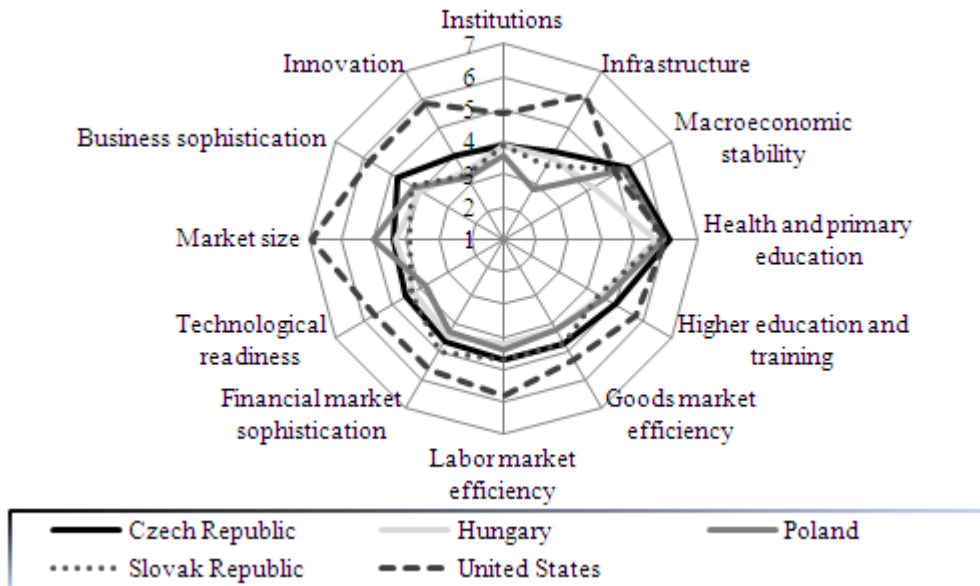
Fig. 2. Pillars of GCI 2008-2009 (Source: WEF, 2008).
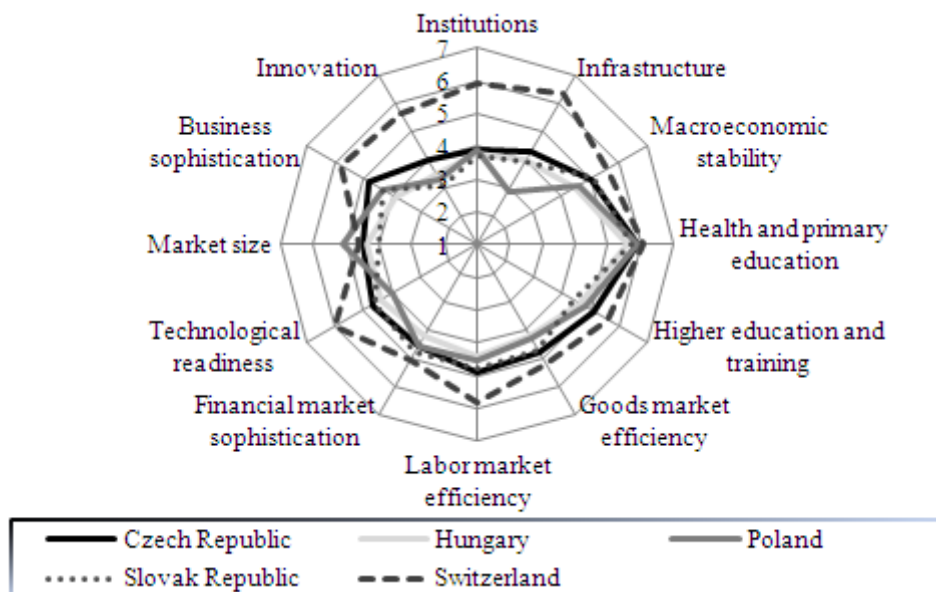
Fig. 3. Pillars of GCI 2009-2010 (Source: WEF, 2009).
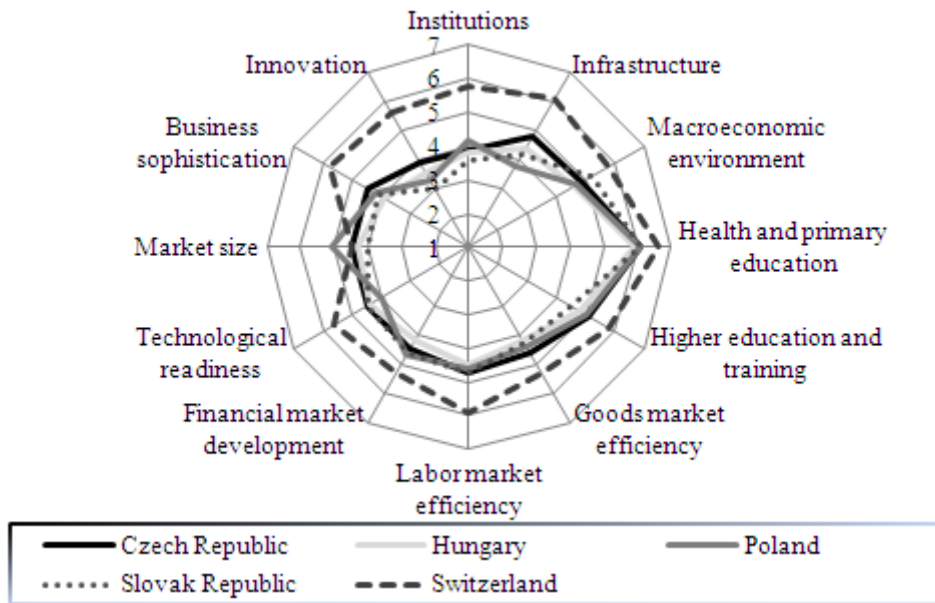
Fig. 4. Pillars of GCI 2010-2011 (Source: WEF, 2010).
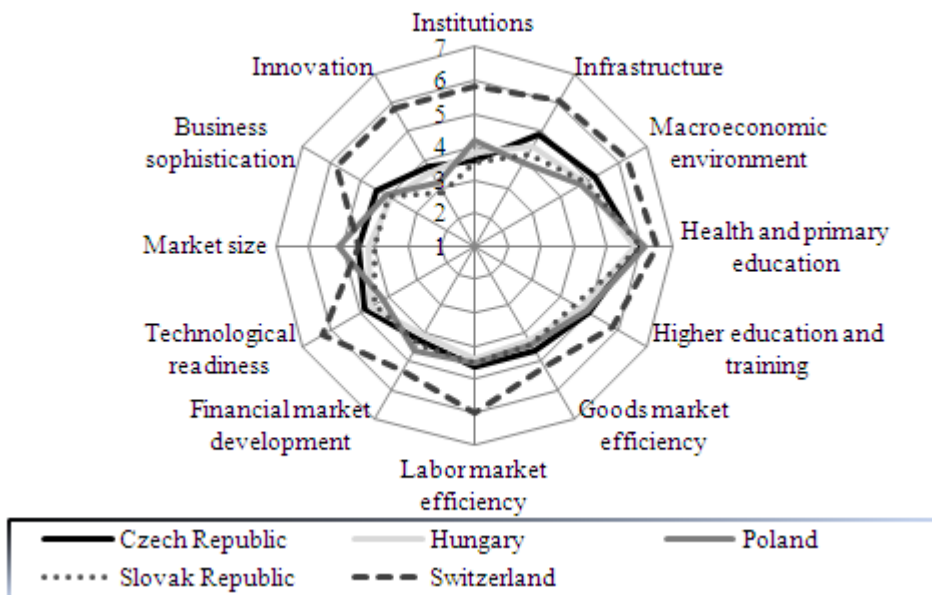
Fig. 5. Pillars of GCI 2011-2012 (Source: WEF, 2011).

4. Conclusion

In recent years, more and more experts have been dealing with the issue of competitiveness. We can evaluate competitiveness at the enterprise and regional or national level. A unique approach to the definition of competitiveness does not exist, and I dare say that it will never exist. The easiest way to define competitiveness is at the enterprise (microeconomic) level, and we can say that an enterprise is competitive in case it can constantly adapt to the changing market environment and remain on the market. The evaluation of competitiveness at the national or regional level is more complicated. We can say that there are three directions providing a definition of national competitiveness – an

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approach based on the evaluation of external competitiveness, aggregate competitiveness and wide approach of competitiveness.

The aim of this paper was to evaluate the competitiveness of the Visegrad countries due to the global competitiveness index. According to the index GCI 2011-2012 the most competitive economy can be found in the Czech Republic, followed by Poland, the third position belongs to Hungary and the last position belongs to the Slovak Republic. GCI is based on evaluation of competitiveness using 12 pillars. Within the evaluation of competitiveness of the V4 countries through various sub-pillars the Czech Republic was eight times ranked in the first position (in the field of infrastructure, macroeconomic environment, higher education and training, goods market efficiency, labor market efficiency, technological readiness, business sophistication and innovation) and Poland for four times (in the field of institutions, health and primary education, financial market development and market size).

5.   Acknowledgement

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Appendix

Table 1. Global Competitiveness Index – The First Three Places.

Pillars	2008-2009	2009-2010	2010-2011	2011-2012
Institutions	Singapore	Singapore	Singapore	Singapore
	Finland	Sweden	Sweden	Sweden
	Denmark	Denmark	New Zealand	New Zealand
Infrastructure	Germany	Germany	Hong Kong SAR	Hong Kong SAR
	France	Hong Kong SAR	Germany	Germany
	Switzerland	France	United Arab Emirates	Singapore
Macroeconomic environment	Kuwait	Brunei Darussalam	Brunei Darussalam	Brunei Darussalam
	Brunei Darussalam	Algeria	Kuwait	Kuwait
	Hong Kong SAR	Kuwait	Oman	Oman
Health and primary education	Finland	Finland	Belgium	Finland
	Iceland	Iceland	Finland	Belgium
	Belgium	Belgium	Singapore	Singapore
Higher education and training	Finland	Finland	Finland	Finland
	Denmark	Denmark	Sweden	Sweden
	Sweden	Sweden	Denmark	Switzerland
Goods market efficiency	Singapore	Singapore	Singapore	Singapore
	Hong Kong SAR	Hong Kong SAR	Hong Kong SAR	Luxembourg
	Netherlands	Luxembourg	Luxembourg	Hong Kong SAR
Labor market efficiency	United States	Singapore	Singapore	Switzerland
	Singapore	Switzerland	Switzerland	Singapore
	Switzerland	United States	Hong Kong SAR	Hong Kong SAR
Financial market development	Hong Kong SAR	Hong Kong SAR	Hong Kong SAR	Singapore
	Singapore	Singapore	Singapore	Hong Kong SAR
	New Zealand	New Zealand	Australia	Malaysia
Technological readiness	Netherlands	Sweden	Sweden	Switzerland
	Sweden	Netherlands	Luxembourg	Sweden
	Denmark	Switzerland	Netherlands	Iceland
Market size	United States	United States	United States	United States
	China	China	China	China
	Japan	Japan	Japan	India
Business sophistication	Germany	Japan	Japan	Japan
	Switzerland	Germany	Sweden	Sweden
	Japan	Switzerland	Germany	Switzerland
Innovation	United States	United States	United States	Switzerland
	Finland	Switzerland	Switzerland	Sweden
	Switzerland	Finland	Finland	Finland
Global Competitiveness Index	United States	Switzerland	Switzerland	Switzerland
	Switzerland	United States	Sweden	Singapore
	Denmark	Singapore	Singapore	Sweden

Source: WEF (2008, 2009, 2010, 2011).

EFFECTIVE TAX RATES, ITS COMPONENTS AND FOREIGN DIRECT INVESTMENT

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Abstract. The empirical literature generally accepts the influence of corporate taxes on the investment decision of the multinationalities. The literature usually considers more aspect of that tax then only statutory corporate tax rate. Using annual time series data for the period 1998-2009 this paper examines the influence of EMTR and EATR including their components on the foreign direct investments in the EU Member States. The main aim of the paper is to evaluate which of the chosen types of effective tax rates explains the investment decisions of the multinationalities the best. The paper will use the conceptual framework according Devereux et al. (2009). The results of a work show that the commonly used indicators of effective tax burden are for FDI explanation in the investigated model not the best option. Perhaps the best indicator for evaluating dependencies between explanatory variables and FDI are the average and marginal effective tax rate from intangible assets.

Keywords: foreign direct investment, effective marginal tax rate, effective average tax rate.

JEL Classification: H25, B16, B23.

1. Introduction

The sharp integration of financial markets is probably one of the most considerable features of globalization in the last decade. Foreign direct investments (FDI) are considered to be one of the key features of the globalization and the world economy. Probably all governments are keen to attract them. Their inflow can support creation of new working places, bring new technologies or more generally support employment and economic growth (OECD, 2008). FDI have gained important influence as a tool useful for development and support of growth in the transforming economies. They are significantly different from other forms of capital investment, mainly by their nature and duration of the commitment which include (Barrel and Holland, 2000). Their purpose is to create cross-border commercial relations and simultaneously managerially influence foreign company. FDI can be considered as a tool which enables countries to reach their goals through introduction of new managerial and technological techniques (Mateev, 2008).

Support of FDI flows is according Masuku and Dlamini (2009) the key to assess determinants of a private investment. They argue that lot of empirical works which are clarifying those factors are based on the neoclassical theory of optimal capital accumulation which considers the reaction of capital demand on the changes of relative prices of production factors. Alternative approach is based on idea that fixed capital investments of the company are dependent on its expected demand relatively to existing capacity of the company and its ability to generate sources of the investments.

Another type of studies (Greenwald et al., 1984) disagree with some of the neoclassical assumptions[20] and argue that asymmetric information about the quality of the applicant for a loan may lead to lending according rationing system and thus the loan can not be accessible to all applicants. In a result the companies have tended to rely on their own sources and if necessary to debt their own property.

Gastanaga et al. (1998) conclude that a lot of theories were developed for the FDI explanation; the most important is eclectic approach (Dunning, 1981 a, b). According this approach, FDI is oriented at

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[20]Greenwald et al. (1984) do not agree with assumption that every desired investment can be financed.

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countries in which they can reach specific advantage (ownership, localization, and internationalization). The first mentioned is advantage of ownership. This may occur as e.g. knowledge of a brand, ownership of a patent or technology. The second one is localization advantage, e.g. why is for the company favourable to have its residence in the host country. This benefit can be ensured by comparative advantages of a host country, lower transactional cost or by absence of tariffs. The third one is internationalization advantage. Gastanaga et al. (1998) point out that mainly second and third point can be significantly affected by the political situation of the host country and by its institutional system. Dunning (1993) later identified four main motives for foreign investments; they are source-, market-, asset- and capability-seeking.

Foreign direct investment are analysed from a lot of views, between examined questions belong the analysis of factors which have impact on FDI inflow. Evaluated factors are mainly political, institutional and economical indicators. For example Gastanaga et al. (1998) search mostly the effects of political and institutional variables on the FDI flows. They show that the host country policy has impact largely on localization decisions. In their work they conclude enforceability of contracts, country risk, bureaucratic delays or corruption. Bénassy-Quérée et al. (2007) are interested in the influence of institutional and political variables such as protection of human rights, rule of law or corruption on FDI and conclude that those variables tend to influence foreign direct investment. According Buchanan et al. (2012) the other considered institutional variables are e.g. enforceability of rights and property rights. On conclusions of many empirical works they show that important economical variables with impact on localization of the FDI belongs market size, trade[21], balanced budged and inflation which is seen as a indicator of pressures inside the economy and the inability of the central bank and government to restrict money supply.

Asiedu (2001) in her work concludes six most important factors which have influence on FDI and are commonly used in the empirical literature. Those factors are including their effect on the FDI shown in Table 1.

Reduction of trade barriers over the last decades have led to the liberalization of the capital flows. This evolution supports the influence of corporate taxes on the foreign direct investment as a factor important for the tax competition between the countries. In the connection to this development the wide range of empirical literature is engaged in the impact of corporate taxes on decision-making of the enterprisers. According Hristu-Varsakelis et al. (2011) there is compliance that rapid growth of the FDI in the last decades have led to the usage of the tax differences as a tool for FDI attraction. Devereux et al. (2002, p. 452) states that "corporate tax rates usually increase costs of the capital and act as an investment barrier. Two aspects of this influence (lowering of the taxes and expanding of a tax base) have mutual compensation effect: lower tax rate increases investment incentive, lower tax exemption decreases it." Also De Mooij and Ederveen (2003) in their work point out that corporate taxes influence all three factors of investment decisions, e.g. by modification of foreign companies taxations in comparison to the home.

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[21]Torissi (1985) shows that trade surpluses mark out dynamic and wealthy economy with export potential which is for the FDI more attractive.

Table 1. The impact of the chosen variables on FDI.

Determinants of FDI	Positive	Negative	Insignificant
Real GDP/capita	Schneider and Frey (1985) Tsai (1994) Lipsey (1999)	Edwards (1990) Jaspersen, Aylward and Knox (2000)	Loree and Guisinger (1995) Wei (2000) Hausmann and Fernandez-Arias (2000)
Infrastructure quality	Wheeler and Mody (1992) Kumar (1994) Loree and Guisinger (1995)		
Labor costs	Wheeled and Mody (1992)	Schneider and Frey (1985)	Tsai (1994) Loree and Guisinger (1995) Lipsey (1990)
Openness	Edwards (1990) Gastanaga et al. (1998) Hausmann and Fernandez-Arias (2000)		
Taxes and tariffs		Loree and Guisinger (1995) Gastanaga et al. (1998) Wei (2000)	Wheeler and Mody (1992) Lipsey (1999)
Political instability		Schneider a Frey (1985 Edwards (1990)	Loree a Guisinger (1995) Jaspersen et al. (2000) Hausmann and Fernandez-Arias (2000)

Source: Asiedu (2001).

De Mooij and Ederveen (2003) state that relationship between taxes and foreign direct investment was investigated by Hartman (1984) at first. In his work he distinguishes between financing of the investment through retained earnings and transfer of funds. He focuses on their impact on three variables – rate of profit after-taxation realized by foreign investors; total rate of profit after-taxation; and capital taxation of capital in the ownership of the American investors. He uses the first two variables for the estimation of profitability of the possible investment. He concludes that after-tax rate of profit is more suitable for the companies considering expansion of their current activity, total rate of profit is better for acquisition of existing assets. In his work he shows that retained earnings are more sensitive on the change of the taxes because the companies use them as a marginal source of financing. His work is criticized mainly because of neglecting of the withholding taxes.

Zhiyong (2011) says that studies interested in the effects of taxation have mainly two forms. The first are based on time series estimation and usually consider reaction of the FDI to the variables which represent taxation (Desai et al., 2004, use annual changes in after-tax rate of return), the second apply cross-country regression and they use national or regional differences in taxation. According Zhiyong (2011) the most empirical works of both types concludes that the taxation has impact on the FDI volume and localization.

To the first stream of the empirical work can be comprised e.g. Zhiyong (2011) who in his work analyses influence of legislative changes of corporate taxation on the FDI inflows to the China. The results of his work show that legislation is important factor which has impact on this type of investment. Also Wijeweera and Clark (2006) have shown on the time series data from the USA that corporate tax rate has significant negative impact on the total FDI. Axarloglou (2005) focuses on factors which have influence on FDI inflow to the US. According his work the most important factors are relative work productivity, relative expenses at education and relative rate of criminality. Important are also tax incentives. Asano (2010) evaluates optimal FDI timing by foreign companies and optimal tax policy of the home country under uncertainty. He shows that home country should in a reaction on the growing uncertainty lower corporate tax rate. Razin et al. (2005) are interested in question how the taxes influence bilateral FDI. They point out that lot of works receives simplified results by statement that the tax differentials between individual countries are core factor for the

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direction and volume of the FDI. They argue that tax rates in the home country influence only the selection process whereas tax rate in the host country influence volume of the FDI if they will occur. Cassou (1997) is interested in the influence of the tax policy on the FDI flows in the case of the USA and other countries. He shows that home and host corporate tax rates has significant influence on the investment flows, other important variable is income taxation. Wamser (2011) analyses question how taxes influence decision-making of the Germany multinationalities at the level of branches, within the analysis consider that the important part of the investment is indirect. In his work he confirms results of the theoretical literature that influence of taxes on FDI differentiates according investment regime of the given country.

The third approach which is used in the last years enables to combine time and space. Buchanan et al. (2012) applies panel data to clarify impact of the institutional quality on the level and volatility of the FDI, the results of their work show positive impact of that type of environment on the FDI, on the other side the quality of institutions is negatively connected with low economic growth. Bénassy-Quérée et al. (2005) estimate reaction of FDI flows on the corporate taxation in the OECD member countries, in their study they point at the negative impact of tax differences. According them a lot of empirical works show that the economy can enable exception from the foreign investor income as a form of investment incentive and it helps to attract foreign investment. The commonly used practice is according their study usage of debt financed branches of the multinationalities in the countries characterized by high taxes and usage of own capital as a source in the countries with low taxes. Wolff (2007) is interested in estimation of impact of taxation on the FDI flows within EU25. He shows that high taxation in the home country means higher probability to reinvest profit in foreign country and lower share of debt-financed FDI. It means that the corporations are trying to avoid income taxation. Next important variable is according this work market size; unimportant is statutory corporate tax rate in the host and foreign country.

The next possible classification of the empirical works is according the data used for the explanation of corporate tax influence on the FDI. Egger et al. (2009) state that the most empirical works interested in the corporate taxes and FDI uses statutory corporate tax rate or effective average tax rate gained through backward-looking view. According his opinion the first mentioned studies ignore possible impact of tax base on the FDI, effective tax rates disregard forward-looking base of investment decisions and endogenity of the backward-looking tax rates. Usage of statutory corporate tax rates disregards also De Mooij and Ederveen (2003). According them is this possibility applied many times, but the results are confusing.

One part of relevant empirical literature uses backward-looking evaluation of tax burden, this approach enables to approximate variables which summarize interaction of different tax rules. Those studies usually confirm important impact of corporate taxes on FDI (Slemrod, 1990; Devereux and Freeman, 1995). De Mooij and Ederveen (2003) state that effective tax rates are mainly used in three forms. The first one is calculation of average tax rates which are evaluated on the base of micro and macro data. Their advantage is that they take into account planning of tax activities, complex tax provision and administrative practices of tax authorities. The second possibility is to use effective marginal tax rate computed on the base of tax laws. They enable to evaluate returns of marginal investment project before and after taxation if the investor does not require economic rent. The third possibility is effective average tax rate. Its evaluation is based on tax laws too, but is concerned on wedge between marginal return of project before and after taxation of typical investment project with economic rent. Devereux and Griffith (1998) are interested in strategic decision-making of US companies whether and how offer products on the European market; they apply host country effective tax rates. They show that in accordance with theoretical assumptions effective average tax rate is important factor which influence localization of production. Slemrod (1990) evaluates impact of tax systems on FDI in the case of US and in the case of countries which to the US invest. His work confirms negative impact of effective taxes on the total FDI, this impact is not confirmed in the case

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of retained-earnings investment. Devereux and Freeman (1995) estimate impact of taxation on FDI and show that the choice between home investment and total outgoing FDI is not significantly influenced by FDI whereas taxation has significant impact on localization of outgoing FDI. Egger et at. (2009) focus on the impact of corporate taxes on FDI within OECD countries. Within their work they use effective marginal tax rates (EMTR) and effective average tax rates (EATR). They conclude that it is necessary to use one-sided (host and home country specific) and two-sided (mutual specific) elements of effective tax rates. They show that one-sided tax rates have significant impact on production- and localization decision making of multinationalities. They also find out that usage of only one-sided rates can have misleading conclusions about impact of bilateral tax tool (e.g. agreements) on bilateral FDI. They show that bilateral parameters of tax rates capture direct impact on FDI. Conceptual framework use also Bénassy-Quérée et al. (2005) for evaluation of bilateral FDI flows within OECD. Egger et al. (2009) state that the most works uses country-specific effective tax rates.

2. Corporate effective tax rate in the EU

The aim of this part is to evaluate effective tax rates in the EU member countries in 1998 – 2009. We will use effective marginal and average tax rates and their components. The chosen variables will be evaluated also for the new (EU12)[22] and old (EU15) EU member countries. The data are received from work of Devereux et al. (2009). In this paper the authors have introduced estimation of effective tax rate on investment within the EU member countries; they used methodology according Devereux and Griffith (1999). This method considers a hypothetical incremental investment located in a specific country undertaken by a company resident possibly in the same country, but also possibly in another country. According to given required real rate of return it is possible to use tax laws and calculate required before-tax rate of return (cost of capital). Effective tax rate is understood as proportional difference between costs of capital and require rate of return after taxation. Additional attitude is effective average tax rate which consider discrete choice between investments. In this case is the result of taxation evaluated as share of total tax revenues in given locality. Within their calculation[23] authors consider investment to five different financial assets – intangible assets, industrial buildings, machinery, financial assets and inventory. They also use three sources of financing – retained earnings, new equity and debt.

Partial components are divided according investment in different assets and different sources. Those components are evaluated for effective marginal and average tax rate. The total EMTR and EATR are obtained by aggregating of different type of assets and source of financing. Particular assets are weighted equally; weight of source of financing is according OECD (1991) following: retained earning 55 %, new equity 10 %, and debt 35 %.

Fig. 1a, 1b show data which represents total effective marginal and average tax rates in 1998 and 2009. The data show that in the observed period has tax burden nearly in all economies rapidly declined. This development is mainly given by decrease of statutory tax rates which has occur in all economies except Latvia and Ireland, also in France it stagnates.

The progress is same in the case of EATR and its components, this type of tax burden has increased only in Ireland (5 p. p.) and in Hungary (0.5 p. p.). EMTR grows in Lithuania (1.5 p. p.), Ireland (5.5 p. p.), Slovenia (4 p. p.) and Italy (11.1. p. p.), in those countries grows also the most EMTR components. Quite different development can be seen in EMTR components focused on investment in machinery and buildings. More than 1/3 countries show their increase. Completely different is trend in the component of debt financing of potential investment which is in the negative values, in time, however, shows and increasing trend. Lammersen and Schwager (2005) state that the

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[22] Bulgaria, Cyprus, Latvia, Estonia, Lithuania, Romania, Slovenia, Slovakia, Czech Republic, Hungary, Malta, Poland.
[23] Next assumptions are: shareholders require real rate of return 5 %, inflation rate 2 %.

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negative values are due to the fact that costs of capital are lower than real interest rate and it suggests that in the country can occur indirect tax support of investment which increase the rate of profit after-taxation above rate of profit before-taxation.

There was noticed quite different evolution of tax rates in the old (EU15) and new (EU12) EU member countries. There was below-average value in the six countries of EU12 in the case of EMTR, in the case of EATR it was seven countries from the same group in the 1998. At the end of 2008 it was in both cases 11 countries, exception was observed only in Malta. Those conclusions are in accordance with idea that new EU member countries strive for offering of more favourable tax conditions to the investors (Kubátová, 2011).
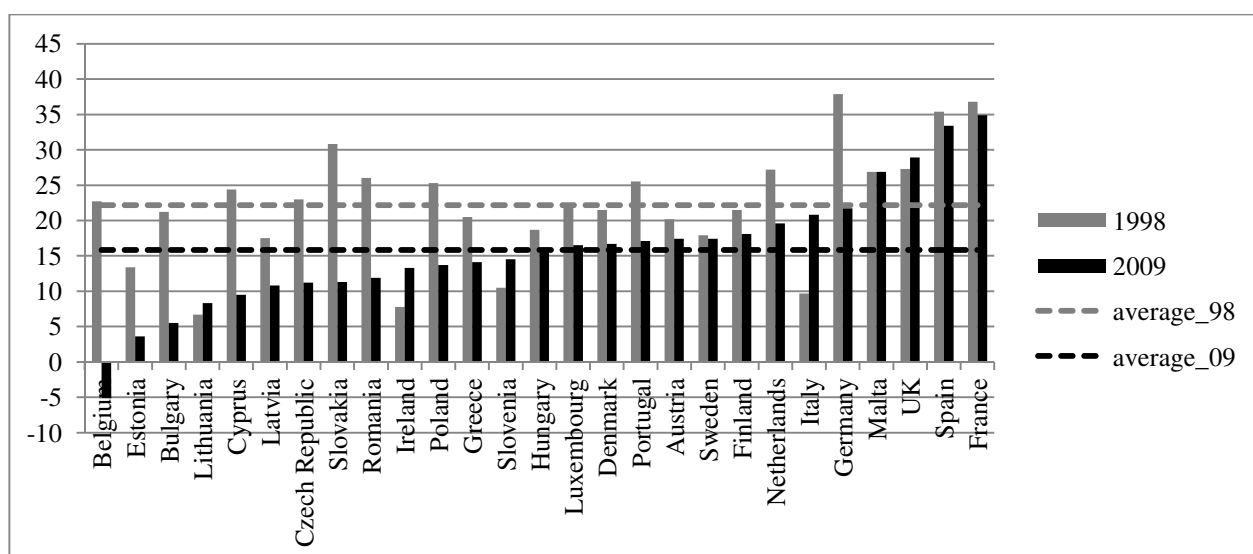
Fig. 1a. Total corporate effective marginal tax rate in the EU, 1998, 2009 (Source: Devereux et al. (2009), own calculation).
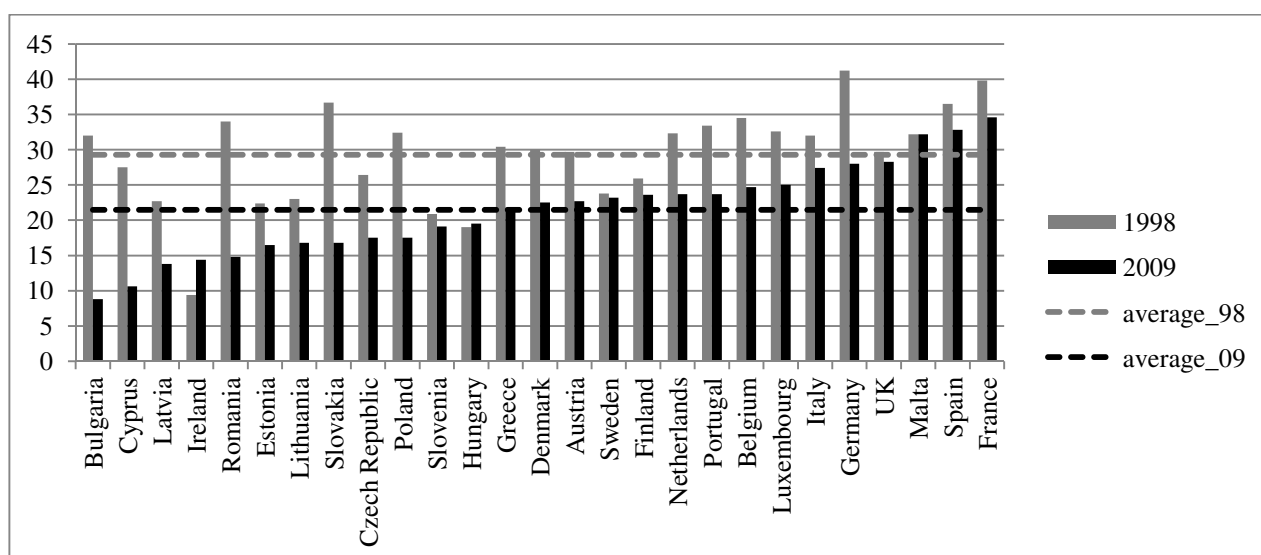
Fig. 1b. Total corporate effective average tax rate in the EU, 1998, 2009 (Source: Devereux et al. (2009), own calculation).

Table 1a and Table 1b show EMTR and EATR components. Table 1a represents evolution of EMTR/EATR according investment in different assets. It is clear that in spite of the most significant decrease of tax burden of financial asses they are still the most burdened, on the other side the leas tax

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burden is on investment on intangible assets. For all components of the MTR and ATR is also true that the new EU member states had at the beginning of the period lower tax burden than the EU15 countries, these countries also declined the tax burden declined more significantly. These findings again support the general awareness that the new member states seek to provide investors more favourable tax conditions.

Table 1b shows values of EATR and EMTR components according to different sources of financing. It is visible that in the cases of retained earnings and new equity are only small differences and tax burden is in time smaller, debt financing is much more favourable. As it was said earlier, EMTR values are in the case of debt financing in negative values nevertheless have growing tendency in time.

Also for different ways of financing a potential investment project is valid statement that the EU12 countries have lower tax burden than the EU15 and the values of EU12 are also falling rapidly. For the case of debt financing EMTR there was in the 1998 lower values in EU15 than in EU12 nevertheless in the EU12 has undergone only slight increase and EU15 reaches values above average.

Table 1a. EMTR, EATR components, EU member countries, 1998 and 2009.

year	Industrial buildings	Intangibles	Machinery	Financial assets	Inventory	MTR
1998	22,481	14,463	14,322	30,585	23,333	22,174
2009	19,030	7,496	10,341	21,611	16,115	15,833
year	Industrial buildings	Intangibles	Machinery	Financial assets	Inventory	ATR
1998	29,600	27,407	27,467	31,885	29,652	29,274
2009	22,481	19,896	20,252	23,344	21,504	21,493

Source: Devereux et al. (2009).

Table 1b. EMTR, EATR components, EU member countries, 1998 and 2009.

year	MTR Retained earnings	New equity	Debt	year	ATR Retained earnings	New equity	Debt
1998	33,478	33,641	-19,119	**1998**	33,189	33,037	22,052
2009	24,219	25,219	-7,937	**2009**	24,126	24,396	16,537

Source: Devereux et al. (2009).

3. Model

The aim of the next part is to evaluate impact of effective tax rate (ETR) and its components[24] on the FDI within the analysis will be investigated whether some ETR component is for FDI explanation the best. The analysis will proceed as follows. At first will be done series of regression analysis of panel data where will be applied ordinary least square regression. The model will be assembled without effective tax rates. Then they will be introduced and will be evaluated difference in explanatory power of both types of model (with and without EATR, EMTR and its components). Within the analysis will be also search direction of influence of each effective tax rate. At the end will be analysed significance of effective tax rates and its components at foreign direct investment. Evaluation will be performed by usage of scoring method[25]. As an addition will be applied also

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[24] According financing of assets: atr of industrial buildings – ibatr, atr of intangibles – inatr, atr of machinery – mamtr, atr of financial assets – faatr, atr of inventory – invatr; mtr of industrial buildings – ibmtr, mtr of intangibles – inmtr, mtr of machinery – mamtr, mtr of financial assets – famtr, mtr of inventory – invmtr; according to source of financing: atr of retained earnings – reatr, atr of new assets – neatr, atr of debt – dbatr; mtr of retained earnings – remtr, mtr of new assets – nemtr, mtr of debt – dbmtr.

[25] Scoring method assigns points to individual indicators according to their importance compared to other indicators. To determine the score is used relation $b_{ij} = \frac{x_{ij}}{x_{jmax}} 100$, where b_{ij} represents the score of i-possibility of model according to

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simple order method[26]. The data will be analysed for the period 1998 – 2009 because of effective corporate tax rate availability.

The countries for the created model will be chosen according their membership in the EU. This group will be then divided into two relatively more homogenous sub-groups, EU12 and EU15 countries. The main reason for this step is particularly similar evolution of their effective tax rates.

In the model created for analysis of effect of effective tax rates on foreign direct investment are used following explanatory variables: *effective tax rates* and its *components* which are gained from Devereux et al. (2009). Control variables are consistent with studies Asiedu (2001) and will be used the following indicators: *real GDP in PPP / capita, labor costs* (hourly labor costs in PPP), the *openness* of countries and *political instability*. The last indicator is part of the Worldwide Governance Indicator and expresses the perception of the likelihood that in the country will change the government. Data sources of control variables are especially Eurostat databases and Penn World Table, which ensures comparability of used data.

Explained variable is represented by foreign direct investments those play within tools of international capital transfers specific role. OECD (2001) states that foreign direct investments are in comparison to the portfolio flows more stable tool and they offer to the host country lower capital account volatility.

There are two main possibilities how to measure FDI – as a *FDI flows* and as a *FDI stock* in given time. The second mentioned possibility prefer Guerin and Manzocchi (2006), they state that FDI stock is only indicator which can precisely capture volume of foreign capital in the economy. Masuku and Dlamini (2009) on the other side consider the FDI flows as more important. The flows are also used by Bénassy-Quérée et al. (2005). Both types of time series (FDI flows and stock) will be for better comparison considerate to the GDP and per capita.

Each time series was tested for stationary by unit rood test according Levin, Lin and Chu. Problems were found in time series represented labor costs, FDI stock per GDP and FDI stock per capita. In the case of those time series this result is in accordance to their long-term growing trend. The non-stationary problem can be solved e.g. by logarithm of the data or by differentiating them. Within the model was used logarithm because of better interpretability of the received data. Woolridge (2009) states that panel data regression is usually analysed with fixed and random effects. He argues that if the number of cross-sectional data is significantly higher then monitored period than should be used random effects. Our model is consistent with this assumption therefore it was tested at the presence of random effects by Hausman test. Within econometric verification of the model is necessary to make statistical test of residuum. Therefore was used White Cross-Section Method which ensure significance of t-statistic and standard errors by their correcting for heteroskedasticity and autocorrelation. Total model and coefficients are estimated at 5 % level of significance.

The results of the model used for all EU member countries show that the model is the best suited to estimate the FDI stock (both for FDI stock per capita and FDI stock per GDP) these modifications have R^2 more than 50 %. The inclusion of effective tax rates increased the explanatory power of models of this group by about 3.2 percentage points; better results are obtained for EATR.

Table 2 shows the differences between the explanatory power of the model without effective tax rate and after its inclusion in the model, missing values indicate that the inclusion ETR was statistically insignificant. The greatest increase of interpretation level have been found in model

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the *j*-way of effective tax rate evaluation, x_{ij} represents *j*-way possibility of effective tax rate measurement in *i* possibility of model and x_{jmax} represent the highest value of *j*-way of effective tax rate measurement. The resulting score is given by $C_i = \frac{1}{n}\sum_{j=1}^{n} b_{ij}$, where C_i represents average value if *i*-way how to measure effective tax rate, *n* is number of indicators. Detailed description and its advantages and disadvantages can be found in Scholleová (2009).

[26] Simple order method is based on sorted values according to best value of the file; the final result is given by the sum of the result indicators. Disadvantage of this method is that it does not evaluate the difference between the values. Detailed description and its restrictions offer e.g. Scholleová (2009).

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characterized by FDI flows per capita after the application of effective tax rates, the R^2 increased on average by more than 4.5 percentage points in the case of marginal ETR and in the case of inclusion of average ETR it was more than 5.7 percentage points. This type of model which involves METR components also shows the largest variance between the obtained values.

The established model shows that ETR have a negative effect only on FDI flows / GDP, the positive effect was shown on FDI flows / capita. For other variants predominates positive impact of effective tax rates.

Table 2. R^2 change after ETR inclusion, its direction, EU.

FDI flows/capita					FDI flows/GDP				
ibmtr		-	ibatr	+	0,05147	ibmtr	+	0,01302	ibatr	-	0,00625
inmtr	+	0,02172	inatr	+	0,06012	inmtr	-	0,01105	inatr	-	0,04673
mamtr	+	0,02690	maatr	+	0,04954	mamtr	-	0,01157	maatr	-	0,03212
famtr	+	0,04266	faatr	+	0,04727	famtr	-	0,02127	faatr	-	0,03434
invmtr	+	0,10714	invatr	+	0,07078	invmtr	-	0,01473	invatr	-	0,02968
remtr	+	0,05637	reatr	+	0,05773	remtr	-	0,01320	reatr	-	0,02922
nemtr	+	0,06014	neatr	+	0,05626	nemtr	-	0,01957	neatr	-	0,03009
dbmtr	+	0,00140	dbatr	+	0,05969	dbmtr	+	0,00714	dbatr	-	0,02826
mtr	+	0,07303	atr	+	0,06067	mtr	-	0,01083	atr	-	0,02952
FDI stock/capita					FDI stock/GDP				
ibmtr	-	0,01862	ibatr	-	0,00490	ibmtr		-	ibatr		-
inmtr	+	0,09957	inatr	+	0,00746	inmtr	+	0,04780	inatr		-
mamtr	+	0,00584	maatr		-	mamtr	+	0,02307	maatr		-
famtr	-	0,01032	faatr		-	famtr	-	0,01305	faatr	-	0,00726
invmtr	+	0,01349	invatr		-	invmtr	+	0,01223	invatr		-
remtr		-	reatr		-	remtr		-	reatr		-
nemtr	+	0,02864	neatr		-	nemtr	+	0,02938	neatr		-
dbmtr	+	0,03570	dbatr		-	dbmtr	+	0,01648	dbatr		-
mtr	+	0,00517	atr		-	mtr	+	0,00967	atr		-

Source: own calculation.

The next studied possibility is the same series of models applied on the new EU member countries. Results shown in Table 3 indicate that widening of the model by effective tax rates has led to the growth of estimated R^2 approximately about 5.5 p. p. This is only small improvement compared to all EU countries. In this case the differences between impact of effective average and marginal tax rates is negligible.

Within the models the largest dispersion between different EMTR components under option FDI / capita and FDI flows / GDP. The most significant increase of explanatory power is noticed in the model FDI flows / capita; after AETR its explanatory power grows more than 10 p. p.

If we compare models representing EU 12 with group EU it is evident, that the direction of effect of the taxation in the case of FDI flows/capita and FDI/GDP remain negative. On the contrary the impact of effective tax rate on FDI stock / GDP remain significantly negative.

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Table 3. R^2 change after ETR inclusion, its direction, EU12.

FDI flows/capita						FDI flows/GDP					
ibmtr	+	0,05391	ibatr	+	0,10668	ibmtr			ibatr*	-	0,05038
inmtr	+	0,08974	inatr	+	0,10007	inmtr	-	0,13830	inatr	-	0,10154
mamtr	+	0,03075	maatr	+	0,09012	mamtr	-	0,05368	maatr	-	0,08690
famtr	+	0,06154	faatr	+	0,09443	famtr	-	0,11206	faatr	-	0,10306
invmtr	+	0,11582	invatr	+	0,10663	invmtr	-	0,10555	invatr	-	0,09011
remtr	+	0,06638	reatr	+	0,09826	remtr	-	0,09266	reatr	-	0,08926
nemtr	+	0,10918	neatr	+	0,10309	nemtr	-	0,06754	neatr	-	0,07850
dbmtr	-	0,00435	dbatr	+	0,10236	dbmtr	+	0,05388	dbatr	-	0,07778
mtr	+	0,10546	atr	+	0,10273	mtr			atr	-	0,08715

FDI stock/capita						FDI stock/GDP					
ibmtr	-	0,04543	ibatr	+	0,00297	ibmtr	-	0,01028	ibatr	-	0,001985
inmtr	+	0,01296	inatr	+	0,02428	inmtr	-	0,01362	inatr	-	0,002367
mamtr		-	maatr	+	0,01984	mamtr*	-	0,00021	maatr		-
famtr		-	faatr	+	0,01890	famtr	-	0,03904	faatr	-	0,00463
invmtr	+	0,00558	invatr	+	0,02113	invmtr	-	0,01924	invatr		-
remtr	-	0,00379	reatr	+	0,00879	remtr	-	0,04753	reatr	-	0,007398
nemtr	+	0,04250	neatr	+	0,03468	nemtr	+	0,00298	neatr		-
dbmtr		-	dbatr	+	0,03562	dbmtr	+	0,02764	dbatr		-
mtr		-	atr	+	0,01691	mtr	-	0,02144	atr	-	0,002336

*coefficient is significant at 10 % level of significance
Source: own calculation.

The last tested possibility is application of model on the old EU member countries (Table 4). The average improvement of explanatory power of the model after including of effective tax rate was 4 p. p. The difference between this model and its variant for EU 12 can be considered as unimportant. Slightly better explanatory power (about 5 p. p.) is similarly like EU group reached after implementation of effective average tax rates. The biggest variance is newly recorded within model of FDI stock/capita. The explanatory power is similarly as in EU12 case highest in the case of FDI flows /capital after implementation of effective average tax rates (about 6 p. p.).

The great difference can be seen when it is evaluated direction of influence of effective tax rates. Nearly all possibilities show negative impact of taxes both on FDI flow and taxes related to capita and GDP. The significant exception is the case of FDI stock and flow /GDP when is used effective marginal tax rate, where in the first mentioned case are EMTR not statistically significant.

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Table 4. R^2 change after ETR inclusion, its direction, EU15.

FDI flows/capita						FDI flows/GDP					
ibmtr	-	0,06078	ibatr	-	0,07699	ibmtr		-	ibatr*		-
inmtr	+	0,00318	inatr	-	0,03932	inmtr	+	0,01832	inatr		-
mamtr	-	0,01805	maatr	-	0,05095	mamtr	+	0,02462	maatr		-
famtr	-	0,04601	faatr	-	0,05474	famtr		-	faatr		-
invmtr	-	0,06670	invatr	-	0,07703	invmtr		-	invatr	-	0,02344
remtr	-	0,04715	reatr	-	0,05818	remtr		-	reatr		-
nemtr	-	0,03953	neatr	-	0,06270	nemtr		-	neatr	-	0,01651
dbmtr		-	dbatr	-	0,07450	dbmtr	+	0,03114	dbatr	-	0,01847
mtr	-	0,04193	atr	-	0,06497	mtr		-	atr		-
FDI stock/capita						FDI stock/GDP					
ibmtr	-	0,01433	ibatr	-	0,06983	ibmtr		-	ibatr	-	0,024023
inmtr	+	0,15103	inatr	-	0,00231	inmtr	-	0,09833	inatr		-
mamtr		-	maatr	-	0,05361	mamtr	-	0,01042	maatr	-	0,023853
famtr	-	0,02429	faatr	-	0,04775	famtr		-	faatr	-	0,02534
invmtr		-	invatr	-	0,06125	invmtr	-	0,01512	invatr	-	0,026832
remtr		-	reatr	-	0,03750	remtr*	-	0,00789	reatr	-	0,016526
nemtr		-	neatr	-	0,03703	nemtr	-	0,01008	neatr	-	0,016297
dbmtr	+	0,04451	dbatr	-	0,07377	dbmtr	+	0,06531	dbatr	-	0,034365
mtr	+	0,00463	atr	-	0,04924	mtr	-	0,02326	atr	-	0,022011

[*]coefficient is significant at 10 % level of significance
Source: own calculation.

The next part assesses significance of effective tax rates and its components on the FDI which are represented by their stock and flows. Evaluation is mainly based on scoring method which values the final score of results and also considers differences between individual values. The results will be accompanied by simple sequence method.

Table 5 shows the final order of effective average and marginal tax rates and its components for the all EU member countries. The indicators are ordered from their significance on the FDI from the most important. The scoring method shows that for the FDI explanation is the best indicator effective tax rate (marginal and average) for investment to Intangibles (*inmtr, inatr*), the significant difference is compared to other possibilities visible mainly in the case of average ETR. This result is supported by final order of simple sequence method where is the ETR on Intangibles placed on the leading positions. Aggregated indicators *mtr* and *atr* reach on the base of both methods below-average results.

Table 5. Results of ETR components, EU.

Simple sequence method				Scoring method			
nemtr	10,0	inatr	10,5	inmtr	68,0519	inatr	94,9814
invmtr	15,0	invatr	17,5	nemtr	59,5919	invatr	54,5025
inmtr	16,0	faatr	18,0	invmtr	52,0920	ibatr	50,6023
famtr	17,0	**atr**	**19,5**	famtr	44,3690	**atr**	**49,6300**
mamtr	22,0	neatr	21,5	**mtr**	**36,1231**	dbatr	48,2741
dbmtr	23,0	maatr	22,5	mamtr	33,4043	reatr	48,0323
mtr	**25,0**	dbatr	23,5	remtr	28,6736	neatr	47,9615
remtr	26,0	ibatr	23,5	dbmtr	26,3035	faatr	46,7606
ibmtr	27,0	reatr	23,5	ibmtr	19,9760	maatr	46,2452

Source: own calculation.

Decision-making of investors is in the case of new EU member countries (Table 6) according to scoring method in the case of effective average tax rates the most important *dbatr*, *neatr* and *inatr*, but the difference between the first values is negligible.

After implementation of different types of effective marginal tax rates components is the variable *inmtr* on the first places and is accompanied, similarly like in the average ETR case, by *nemtr* and *remtr*. Aggregated indicators *mtr* and *atr* reaches on the base of the chosen methods on the below-average results.

Table 6. Results of ETR components, EU12.

Simple sequence method				Scoring method			
invmtr	13,0	inatr	14,0	nemtr	60,7297	dbatr	90,4848
inmtr	14,0	invatr	16,5	inmtr	58,6661	neatr	90,0706
remtr	15,0	faatr	17,0	remtr	58,1626	inatr	86,8482
nemtr	17,0	neatr	19,5	invmtr	57,2652	invatr	82,2512
famtr	17,5	**atr**	**20,0**	famtr	54,0705	faatr	80,5405
mtr	**23,0**	reatr	20,0	ibmtr	42,0408	atr	**76,1247**
ibmtr	23,5	dbatr	21,5	mtr	**34,0430**	maatr	74,8444
dbmtr	25,5	ibatr	24,0	dbmtr	25,2161	reatr	67,8098
mamtr	31,5	maatr	27,5	mamtr	16,4487	ibatr	52,4253

Source: own calculation.

In the case of old EU member states (Table 7) is the most important the indicator which show effective tax rate for the case of debt financing of investment, in the case of the average tax rates it appears to be also convenient to use the indicator constructed on the basis of investment in inventions (*invatr*). *Inmtr* is again the best option. It is quite interesting that within the average components it has reached the last place with the absolutely worst value. Aggregated effective tax rates (*mtr, atr*) again reach in the both methods the below-average results.

Table 7. Results of ETR components, EU15.

Simple sequence method				Scoring method		
inmtr	13,0	dbatr	7,0	inmtr	65,9004	invatr	94,3469
dbmtr	14,0	invatr	7,0	dbmtr	48,9742	dbatr	91,8414
invmtr	18,5	ibatr	14,5	mamtr	29,1764	neatr	67,3382
mtr	**19,5**	**atr**	**21,5**	invmtr	28,8441	ibatr	64,8698
ibmtr	21,0	faatr	22,5	ibmtr	25,1531	**atr**	**50,3648**
mamtr	21,0	maatr	23,5	**mtr**	**22,3943**	maatr	46,2748
famtr	22,0	neatr	24,0	famtr	21,2677	faatr	45,2677
remtr	23,5	reatr	26,5	remtr	19,6781	reatr	42,1209
nemtr	25,5	inatr	33,5	nemtr	17,3788	inatr	18,0585

Source: own calculation.

4. Conclusion

A number of studies highlight the impact of taxes as determinants of economic growth (Kotlán et al., 2011). A favorable tax environment can also improve the investment climate for foreign direct investment by reducing the total cost of investment for foreign investors and thus increase the profitability of investment. The idea of the positive role of the fiscal environment for influencing FDI flows is supported by a wide range of relevant literature. Its findings show that corporate taxation affects investment decisions of multinational companies (Mooij and Ederveen, 2003).

The aim of this paper was to evaluate the effect of EMTR and EATR and their components on the foreign direct investment in the EU in the period 1998 – 2009, especially to show whether any of the examined types of effective tax rates explains corporate investment decisions with regard to FDI the best.

Influence of effective tax rates was studied on the example of all EU member countries and the countries of the EU12 and the EU15. Distribution of EU countries was carried out because of greater similarity to particular types ETR within these groups. The importance of this step was confirmed since the creation of homogeneous groups and application of effective tax rates in the model with its import value increased by 4.5 p b in the case of the EU15 and by 5 percentage points for the EU12 countries, while in the original model increased by only 3 percentage points.

The investigated models show that in the new EU member states are effective average and marginal tax rate more important for explanation of investment flows than for the old member states. This difference is the most visible in the case of FDI flows / GDP, this result supports the idea that the new member countries try to provide more favourable tax conditions to attract new investors (Kubátová, 2011). Tax incentives as a toll for FDI support are in those countries usually implemented in a relatively short time horizon. On the other side effective tax rate is more important for the FDI stock in the old member states. This suggests long-term impact of tax incentives for the creation of this stock, while the annual changes are less important. Important are also differences in the significance of average and marginal effective tax rates for investment decisions regarding the flow FDI / GDP. While in the case of the old member countries are these indicators not statistically significant, in the case of new member countries are mostly statistically significant at the 5% level of significance and explanatory power of the model increased by almost 9 percentage points.

By tested models was found negative impact of effective tax rates on FDI flows and stocks / GDP, especially in sub-groups of new and old member states. The negative impact of ETR on the indicator flows and FDI / capita has been demonstrated only in the group of old member countries.

The results of a work show that the commonly used indicators of effective tax burden are for FDI explanation in the investigated model not the best option; this result was confirmed in all sub-groups

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where it achieves below-average values. In all treatment groups were the most suitable values of marginal effective tax rates near its maximum. This indicates that these indicators were significant in all models examined. In contrast, the average effective tax rates at the forefront of reaching scoring were around 60 % of the possible maximum. Perhaps the best indicator for evaluating dependencies between explanatory variables and FDI are the average and marginal effective tax rate from intangible assets (*inatr / inmtr*). This conclusion is confirmed especially for a group of EU27 and EU15 for marginal ETR, where those values are significantly higher than all other variants. Also in the group EU12 are effective tax rate on intangible asset above-average, the differences when compared to better alternatives are negligible. In this group (EU12) is the best to clarify the investigated relationship effective marginal tax rate for financing of the potential investment by new property.

5. Acknowledgement

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A DEBT CRISIS OF THE STATE

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Abstract. It is generally known that many states all over the world have currently a big problem – a big debt of the state. There are a various approaches to this problem and there are also various options how to resolve it. Therefore, this article describes and evaluates the possibilities of solving the debt crisis of the state by empirical analysis of some relationships between debt of the state and other economic indicators. The debt level, often scaled by the country's GDP, is one of the most commonly used indicators of a country's ability to face its obligations. But in fact there is no certain percentage of GDP where the debt crisis occurs. This is the reason why is in the article also created and suggested a method how the debt crisis of the state can be measured. It concerns the hypothesis that the excessive interest payments which are connected with excessive debt means that the money are not returned to the economic cycle mechanism of the country which can be the cause of the crisis. The aim is to contribute to the discussion concerning the serious problem – the debt crisis of the state.

Keywords: debt of the state, revenue, expenditure, tax rate, inflation.

JEL Classification: H63, H50.

1. Introduction

Macroeconomic theory examines how economic subjects exploit scarce resources. It provides answer questions about how various economic systems works etc. But even in market economy co-exist a state (there is not only a private sector). It is an economic subject and it's role is to ensure activities which wouldn't be done by private sector (e.g. basic education, health care, safety of citizens etc.). But these activities have to be financed. That is the reason why any state needs some revenues. So there is a special budget known as a state budget. We know that every budget contains revenues and expenditures. But these two parts of budget are very different due to the budget itself. Macroeconomic theory knows four types of economic subjects: state, households, firms and foreign subjects. So structure of the budget of households will be quite different than budget structure of firms. The Table 1 shows the differences of the structure of the budget.

Table 1. Budget structure of economic subjects.

Economic subjects	Revenues	Expenditures
Households	wages, transfer payments (e.g. social contributions, rents...)	on goods and services, taxes
Firms	profits, transfer payments (e.g. grants...)	on inputs, wages, taxes
State	taxes	on goods and services, wages, transfer payments
Foreign subjects	import	export

Source: own creation.

Households get wages and other incomes thanks hiring their factors. It is paid them by the other subjects (firms or foreign firms or state). Firms make a profit. It is due to the fact that their product is demanded by households, foreign subjects or by state. Revenues of the state are mainly various types of taxes. The state doesn't get wages and if there were no state firms based on profit making, there are no profits. Foreign subjects can be foreign households, foreign firms and foreign state as well. This is quite complicated, but it is obvious. Foreign subjects make a demand which is in statistical records called export while import represents domestic demand of foreign goods and services. There are many relationships between these subjects and in macroeconomic theory it is known as macroeconomic cycle of state. By the view of budget structure is important that revenue of one

subject is exactly expenditure of other subjects. In our economy, characterized as it is by borrowing and lending based upon margins of safety for both the borrowers and lenders, positions of firms in capital assets, which are expected to yield cash flows as they are used in production, are financed by combinations of equity shares and debts. Similarly, positions in collections of financial instruments owned by commercial banks, insurance companies, savings banks, and so forth are financed by combinations of capital and surplus and debts. (Minsky, 2008)

In other words the expenditure of one's is exactly revenue of other's. In fact this is also known as a cycle. If something was wrong the cycle mechanism wouldn't work. In case of a state debt it means that revenues in budget state are not returned to the economic cycle. It can be caused by excessive interest payments which are connected with excessive debt. Therefore, debt crises are multifaceted. They can be triggered by diverse factors, such as social, political, economic and financial developments. Large imbalances in the net external debt and large net interest payments are a credible early warning signal of rising risks concerning the ability of the economy to successfully meet its external financial obligations, particularly in periods of economic distress or when hit by an external shock. (Dias 2010) In fact, there is a limit to how much debt can be piled on. But there is not a fixed limit for debt or some certain percentage of GDP where it all breaks down. (Mauldin and Tepper, 2011) Thanks to Keynesianism some nations found a new means of stimulating economic growth. Others are intransigent clinging to the Keynesian ways. These nations will be forced to devalue their currencies, restructure their debts, or eventually adopt more severe austerity measures that lead to a muddle through economic growth path that perpetuates stagnation for the sake of liquidating debt, all of which put at risk a nation's productivity, the essential element that defines a nation's standard of living and the quality of life of its citizens. (Crescenzi, 2012) Between the EU countries there a is substantial debate about the appropriate fiscal policy measures - they have to decide whether to provide yet more fiscal stimulus to the economies or to start curbing government debt and deficit through cuts in public expenditures. The economic crisis has given us a valuable lesson: even if we are individuals or companies or governments we have to spend very carefully our money because otherwise we have to pay a price in the future and maybe we cannot afford to pay it. (Inceu, 2011) In an economic slowdown, the government would find that the burden of interest on the national debt would, in effect, fall below expectations. It would thus have more resources available to deal with the crisis. That is fundamental risk management, applied on a national scale. (Shiller, 2008) The key parameters are the size of the debt, the interest rate, nominal growth (GDP plus inflation) and the primary deficit. (Wignall, 2012)

2. Measuring a debt crisis of the state

In connection to above mentioned, we assume that it would be useful to create an indicator which would tell us whether situation about budget of any state is critical or not. Currently we can see various opinions and some policy makers evaluate the situation as critical while others find the same high of state debt not "so much critical". But there are exact numbers and we should be able to evaluate the situation exactly. In fact we can make a scale when measuring a debt crisis of the state.

The starting point is the idea mentioned above. If something was wrong the cycle mechanism wouldn't work. In case of a state debt it means that revenues in budget state are not returned to the economic cycle of particular state. It can be caused by excessive interest payments which are connected with excessive debt. The situation in which all revenues are exactly equal to the interest payments (connected with state debt) could be seen as a break even point. There are three possibilities:

1) state revenues > interest payments connected with a debt of the state
2) state revenues = interest payments connected with a debt of the state
3) state revenues < interest payments connected with a debt of the state.

The first situation mentioned above means that there is a good chance to pay interest payments connected with debt of the state and debt itself as well. Of course, it depends on how much are state revenues higher than interest payments.

The second situation we called break even point represents the fact that all state revenues have to be paid to cover interest expenditures concerning the debt of the state. If all state revenues has to be paid to cover interest expenditures either the state pay it (and than couldn't pay another state expenditures) or pay another payments (and than couldn't pay interest expenditures). This means that this situation can be called a debt crisis of the state. It is only a theoretical construction, because it is obvious that state has various other important or even compulsory expenditures which are established by laws. It means that real debt crisis occurs even before that point and it depends on how high are the compulsory expenditures of the state.

The third situation when state revenues are lower then interest payments connected with a debt of the state is even worse. This is a serious debt crisis of the state. Now we can see that it is possible to create the scale and exactly measure the debt crisis of the state: the more state revenues are lower than interest payments connected with a debt of the state, the worse debt crisis it is. Therefore we should compare the interest debt costs and revenue of states (see Table 2 and 3).

Table 2. Interest debt costs and state revenue in the Czech Republic (billion CZK).

	2007	2008	2009	2010	2011
Debt interest costs	39, 821	39, 449	47, 436	51, 083	52, 613
State revenue	1 476, 428	1 498, 574	1 462, 139	1 484, 362	1 534, 241
Debt interest costs as percentage of state revenue	2,70	2,63	3,24	3,44	3,43

Source: Ministerstvo financí (2012), own calculation.

Table 3. Interest debt costs and state revenue in Greece (billion EUR).

	2007	2008	2009	2010	2011
Debt interest costs	9,8	11,2	12,3	13,2	16,4
State revenue	54	57,7	50,5	53,9	54,7
Debt interest costs as percentage of state revenue	18,15	19,41	24,36	24,49	29,98

Source: Ministerstvo zahraničních věcí (2012), own calculation.

When we compare debt interest costs as percentage of state revenues in the Czech Republic and in Greece we can see the significant difference. In Greece there are debt interest cost nearly 25-30% of state revenue and in the Czech Republic it is nearly 3.5% only. It is generally known that currently the Greece is in a serious debt crisis so 20-30% debt interest costs (as percentage of state revenue) can be thought as an alarming number. Contrary, debt interest costs as 2.5 – 3.5 % of state revenue in the Czech Republic seems to be a satisfying.

When we compare annual changes in debt interest costs and annual changes in state revenues, we obtain also interesting information (see Fig. 1 below).
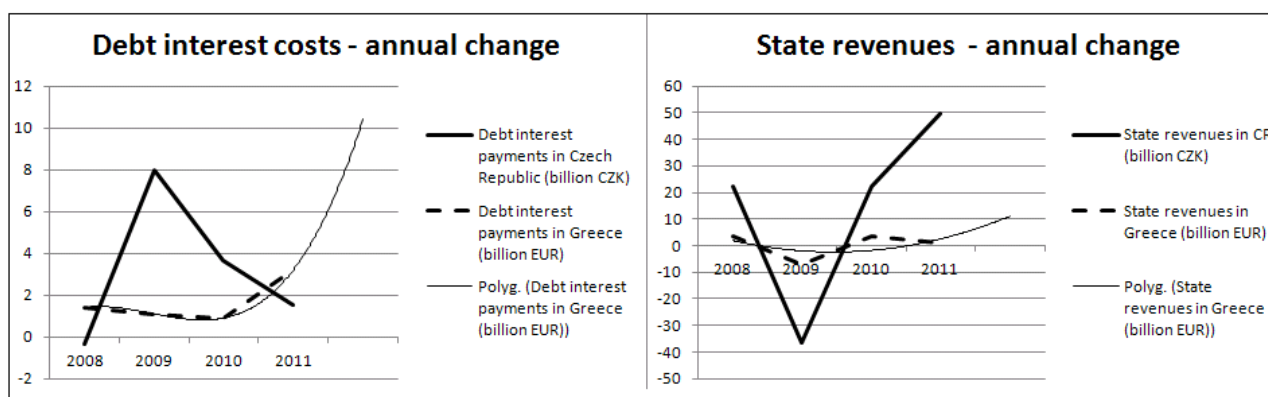
Fig. 1. Debt interest costs and state revenue in the Czech Republic and Greece - annual change (Source: own calculation based on OECD, 2012).

When we compare annual changes of growth of debt interest costs and annual changes of growth of state revenues in Greece, we can see that the annual changes of growth of the debt interest cost are much more distinct. Contrary, in the Czech Republic the debt interest costs are growing but slower (since 2009). In addition to this, the growth of state revenues in Greece is much slower than in the Czech Republic.

3. A debt of the state – how to resolve it

This situation is a result of acting policy makers and progress in economy. It is obvious that any debt come into being when revenues are lower than expenditures. In case of the state it means that taxes are lower than transfer payments and state expenditures on goods and services, wages payed to state employees etc. This simple fact leads to simple idea that a debt can be removed by increasing revenues (especially taxes in case of the debt of the state) or by decreasing expenditures (especially transfer payments or state expenditures on goods and services in case of the debt of the state). Indeed, the debt can be removed this way. But there is not only this one way. There are at least four another options how remove a debt of the state:

1) increasing government expenditures (which leads to increasing aggregate demand and increasing of production and employment rate and which leads to increasing tax revenues),
2) loans from other subjects (private sector or foreign subjects...),
3) monetary expansion (e.g. printing new banknotes),
4) inflation creating (while debt is fixed, prices and wages increase and taxes on wages or profits increases too).

Decrease / increase government expenditures
The first option concerning increasing government expenditures in order to decreasing debt o the state can be seen as paradox. Why should state increase expenditures while there is problem with a state debt? The mechanism was already described: increasing government expenditures leads to increasing aggregate demand and increasing of production and employment rate and this leads to increasing tax revenues. But here it is absolutely necessary to decide about the form of increasing government expenditures. Maybe there is even no need to increase government expenditures but more important is the purpose of expenditures. There are two purposes: consumption and investment.

When increasing government expenditures leads to increasing consumption the debt of the state won't be probably much better. The situation is shown in the Fig. 2.
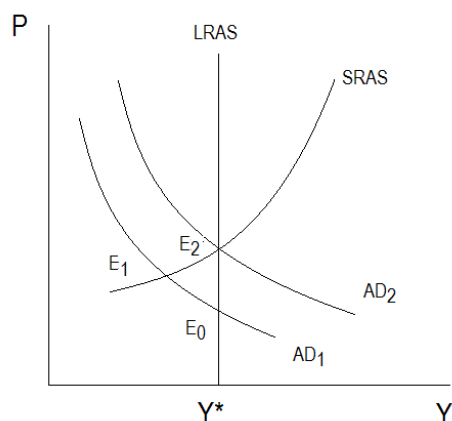
Fig. 2. Increasing government expenditures (Source: own creation).

The figure shows that aggregate demand (AD) increases (AD2) when increasing government expenditure. In a short run (SR) there can be reached higher productivity (form equilibrium point E1 to new equilibrium point E2 and corresponding Y on horizontal axis). But in the long run (LR) there is no effect on potential product (Y*). In the long run there is only impact on price level (P) (form E0 to E2 and corresponding P on vertical axis).

But when increasing government expenditures represents investments, it means, that potential product will be extended (moving long-run aggregate supply – LRAS in figure above to the right). This action should be well-considered because it is necessary to search for good investment opportunities and to be creative. But in history we have already seen examples of such approach. On May 18, 1933, President Roosevelt signed the Tennessee Valley Authority Act. Prior to the Tennessee Valley Authority Act, the region was one of the most disadvantaged. The TVA was given an assignment to improve the economic and social circumstances of the people living in the river basin. In October 1933, construction began on Norris Dam. The TVA engaged in one of the largest hydropower construction programs ever undertaken in the United States. Sixteen dams and a steam plant were constructed by the TVA between 1933 and 1944. At its peak, a dozen hydroelectric projects and the steam plant were under construction at the same time, and design and construction employment reached a total of 28,000 workers. The TVA dams served another purpose as well. They were a popular destination for tourists. During the depression, 1000 people a day visited Wilson, Wheeler, and Norris dams. Today, the TVA ranks as America's largest public power company. The electricity can be produced with a low costs. The TVA has become a major recreation provider as well. The reservoirs behind its dams provide opportunities for fishing, sailing, canoeing, and many other activities, while some 100 public campgrounds provide facilities close to the water's edge.

Loans
Loans from other subject are used in economic reality very often. States borrow to pay their expenditures when their revenues are not high enough. In fact, this is the way how state debt swells much more. It depends on how much are interest rates. It is also important from who the state borrows. Typically it is foreign sector (ECB, IMF, another state etc.). State can borrow from central bank of particular state as well. But macroeconomic theory warns against this solution known as debt monetization. When state issues bonds and sell them to central bank it leads to inflation. That is the reason why the central banks should be independent on government. According to the macroeconomic theory is the best solution when state borrows from their citizens.

Monetary expansion

Monetary expansion (e.g. printing new banknotes) - it is not recommended solution because it leads to inflation. Printing new banknotes means that money base (money supply) increases. Cheap money leads to increasing money demand (increasing wages) and as a result of this (ceteris paribus) is higher price level.

Creating inflation

Inflation creating - while debt is fixed, prices and wages increase and taxes on wages or profits increase too and make the total debt burden smaller. This happened for example in Brazil, which is one of examples of hyperinflation. In the late 1980s and 1990s, it very successfully got rid of most of its debt. In 1993, Brazilian inflation was about 2000 % and four years later was about 7 %. The debt almost disappeared as it has all been inflated away. Brazilian economy is booming and people trust the central bank. (Mauldin and Tepper, 2011)

Many countries have high inflation and hyperinflation is a very special case in which inflation rate is higher than 100 percent. After looking at inflation across all countries and analyzing hyperinflationary history, we can see following:

- Metallic standards like gold or silver show much smaller inflationary tendency than discretionary paper money standards.
- Paper money standards with central banks independent of political authorities are less inflation based than those with dependent central banks.

High inflation destroys the purchasing power of private and public savings. No one wants to hold paper money, so it leads to higher consumption. Investors face uncertainty and do not invest and unemployment increases. It means that in fact inflation would erode the real value of debt.

The conclusion is that there are two main problems when trying to use inflation to get rid of the value of real debt:

- Investors recognize inflation policy and do not invest.
- Pensions and other transfer payments are tied to inflation measures so government expenditures would rise with inflation.
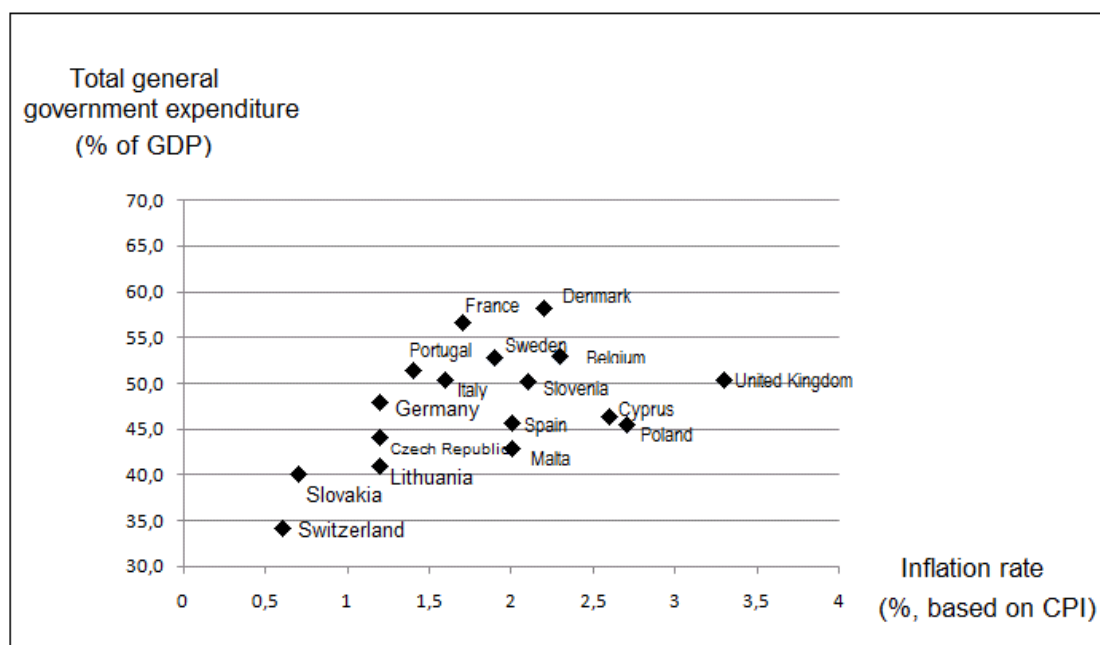
Fig. 3. Government expenditure and inflation rate in 2010 in selected European countries (Source: own caclulation based on Eurostat, 2011).

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The Fig. 3 confirms that government expenditures rise with inflation. The correlation is obvious. That means creating inflation will not resolve the problem of debt of the state.

Effectiveness

Effectiveness is another way how to decrease the debt of the state. It concerns not only expenditure side of the budget but also fight against a gray economy. The action that would help is to increase the efficiency of using public funds is more rigorous checking made by independent institutions.

4. Conclusion

It is generally known that the world is drowning in too much debt. There are several options how to resolve it. It is unlikely that households and governments will be able to pay down that debt. Of course, in some cases it may be possible while in other cases it will condemn people to live in many hard years to be debt-free. Inflation, by comparison, appears to be the easy way out for many policy makers. But in fact inflation would erode the real value of debt. Better idea how to remove the debt of the state is to issue bonds and sell it rather to the private sector than central bank. Another option is to increase government debt and support aggregate demand. When increasing government expenditures leads to increasing consumption the debt of the state won't be probably much better. But when increasing government expenditures represents investments, it means, that potential product can be extended and there will be more production (and better employment rate).

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INTELLECTUAL PROPERTY RIGHTS: REDUCING TRANSACTION COSTS?

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Abstract. Difference of opinions on system of Intellectual property rights (IPR) start with the logic of state-guaranteed protection of intangible assets continue to effectiveness of these regulations and ends at the proposals and rules that should be implemented. Aim of this article is to discuss the foremost question – whether the IPR should be state-guaranteed or not - which is done through deductive-based approach focused on transaction costs issues. Various theoretical approaches to intangible assets market regulation are presented. The current state of IPR protection in the Czech Republic is revised in view of theoretical approaches as well as description of real data on patent registrations. Gradual increase of IPR protection, with respect to patents, can be observed in Czech Republic over the previous years.

Keywords: intellectual property rights, transaction costs, innovation incentives, economic policy.

JEL Classification: O34, D23, K11.

1. Introduction

Are intellectual property rights just a political issue or its shape affect real economy? Is it better to protect ideas and creation of mind by law regulations or leave it institutionally unprotected? Who benefits from intangible assets protection? Those questions and many others arise while debating IPR.

Various points of view exist and affect the way the debate is led. It is interesting to note the shift from derogatory emphasized word privilege to much more positive word property in the context of historical debates. Philosophical point of view deals human being as its own master and pushes the regulation of thoughts ad absurdum, which is also vital for realizing the elusiveness of nowadays ideals. Economists use above mentioned and other approaches to foster their position in understanding and explaining the IPR issue but they hardly agree.

This paper is a modest contribution to the debate. The point of view to the topic is affected by emphasizing transaction costs and institutional point of view. First part of the paper explains the transaction costs theory and its application on IPR issue. Second part deals with intangible assets, their definition and classification. Consideration of development of IPR as an institution is subject of the next section. Above mentioned parts are theoretically based and the methods of exploration and deduction were mostly used.

Fifth part of this paper gives brief description of form of IPR protection of Czech republic, it also bring some statistics on patent protection which were obtained from annual reports of Intellectual property office of the Czech Republic. This part is minor and is incorporated to illustrate the growing extent of IPR protection in Czech Republic.

2. Market Mechanism and Transaction Costs

The term Transaction Costs is associated with R. H. Coase´s article (1937) in which he defines the firm through determinants of its size. At that time does economic theory attributed to market price coordination mechanism the ability to coordinate economic subject. Theory, until Coase´s brilliant paper, was not able to sufficiently explain existence of entities (firms), within which was the market price coordination mechanism suppressed and the factor of production was organized by commands of entrepreneur.

Coase explained this paradox by putting two forces against each other. The first affected the extend of firm positively and it originate in costs of using the price mechanism. Second force work in

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revers and stems from diminishing returns to the entrepreneur function. Contradictory effects result in optimal size of the firm. Entrepreneur incorporates those transactions, which would be costly to realize trough market, there are mainly repetitive transactions.

Costs of using market mechanism – Transaction Costs - are of various types. Discovering relevant prices and identification of sellers and buyers is first point made by Coase (1937). This issue was further developed by Stigler (1961). Cost of negotiation and concluding contracts must also be taken into account. Akerlof (1970) pointed out quality uncertainty and its implications for the market mechanism. We may find other examples of costs of using market mechanism as well as different approaches to incorporation of transaction cost to economic theory Allen (2000).

Transaction costs vary by the market structure and type of commodity and all of them encourage the establishment of institution which aims to lower them. Institution, weather it is formal or informal, private or public, is successful if it reduces transaction costs. However, there are costs associated with the functioning of institutions. These costs counteract the transaction costs and therefore the optimum should be achieved.

The institution should develop till the transaction costs exceed cost of institution existence and in the other hand if the costs of institution existence exceed transaction costs than there should be grounds to diminish institution or to develop other institution. The basis of this assertion lies in the fact that the entities are involved in the market transaction and also contribute to creation of institutions. This conceptual framework is difficult to undergo to empirical evidence. Although there are attempts to measure this types of costs. Different communities would create different institutions. Ostrom (2011) provides meaningful and coherent approach to institutional analysis.

Each category of transaction costs effects on formation of institution; let's briefly mention some of them. The transaction costs caused by quality uncertainty may result in institution which guarantees some level of quality. In the sense of private type of institution we can expect producers to create their brands to develop the perception of quality of the product by individual (for example local butcher can be well known because of his high quality ham), or some group of producers might be formed to set their own standards which should be kept by the members and therefore the consumer will know what quality standard she/he should expect (more butchers agree on marking their top quality products by a certain mark to distinguish their products form other e.g. imported ones). In the sense of public institution are those minimal standards set by law (government sets by law minimal share of meat in products which are claimed to be ham). These three institutions aim to lower the transaction costs caused by quality uncertainty. Further examples of institution can be found in connection with other types of transaction costs. Type of institution which arises should be percept within given framework and can be explained via different theories and verified trough specific models. Let´s shift our focus to the market with intangible assets which are ground for intellectual property rights.

3. Intangible assets

Both tangible and intangible assets are strived for because they are used in the belief of fulfillment, preservation or extension of human being. Economics use a variety of classifications. Assets in the concept of resources are divided to renewable and nonrenewable. In the concept of origin it is distinguished between natural resources and produced. Some assets are determined to consumption and others are used as intermediates for further production. Assets in term of goods can be classified to goods, bads and neuters. We would find more ways of asset classification but let´s focus on the essential and somewhat controversial - intangibles.

According to physical appearance can be distinguished between tangible and intangible assets. Tangibles are capable of being touched or felt and they have a real substance. Intangibles on the other hand cannot be perceived by the senses until they are expressed in a perceptible form. Tangibles are usually used as carriers for intangibles. Novel (intangible) is written (captured in perceptible form) on

the paper or computer, or perhaps filmed on video camera and then distributed through books, e-books, DVD-s, Blu-Rays and other means. Controversy lies in the fact, that tangibles are used in order to distribute intangibles and therefore are tangibles and intangibles often not distinguished. This distribution can be temporary or permanent. You can listen to music on a radio or concert or you can listen it from your CD trough hi-fi in your living room. Transfer of knowledge can be done through the lecture room or book. Once someone ingests intangible asset it is not possible to exclude him or her from further use by physical means. If you hear a song in a radio, you are able to sing it or at least hum it (which in my case excludes other transfer of intangible, but it still brings me some joy). If you read a good cookbook carefully you should be able to cook a dish and also to transfer this ability to someone else.

Most of intangibles are part of so-called public domain which is consisted of intangibles created by our predecessors (most of them are unknown) and considered as general knowledge. This public domain gradually expands as new intangibles are created. Some intangibles though are not becoming part of public domain immediately as their diffusion is controlled by creator. As mentioned above, the diffusion cannot be controlled trough physical means, so the person can pick potential beneficiaries by conclusion of contract and secure protection for his intellectual property. Set of legal regulation, known as intellectual property rights, standardize and adjust rules for dealing with intellectual property nowadays. It states what types of intangibles can and cannot be protected and under which condition. It is not desirable to protect all types of intangibles and to secure ability to exclude from their use (through licensing) forever – in this case we would pay a fee for using the idea of living inside buildings instead of caves, or to pay a fee for proper use of toothbrush. But why it is desirable to protect diffusion of intangibles at all? Economics answer this question trough profit incentives. If the creator of intangible is able to exclude potential beneficiaries from its use, he or she creates scarcity of this asset and is able to gain income. Whether the exclusion should be done exclusively through individual freely entered into contracts of within institutionally guaranteed intellectual property framework is a commonly referred as "Grand question" as noted by Merges (1995), Menell (2000) and Šíma (2004).

Intangibles vary a lot and it is useful to distinguish between those which are intended for consumption and those which are intermediates. Music is played and stories are told to be listened – these kinds of intangibles are intended for consumption. The idea of efficient way to organize production, the idea of the way to enhance product, or the idea of new product to produce – those intangibles are intermediates. Use of the latter should result in more efficient use of factors of production – increase in productivity. If it is successful it is called innovation. Prospect of profit can be understood through uniqueness deriving from intangible. This uniqueness creates barrier for competitors and the creator (user) of the intangible can gain profits until is this barrier overcome (innovation is diffused).

Difficulty of excluding potential beneficiaries is next to subtractability of use. Ostrom (2010) uses these two characteristics to derive four types of goods: common-pool resources, private goods, public goods, and toll goods. Intangibles are non-subtractable which means that doesn't matter how many users are using it at the time, they all can use it. Of course it is matter of interest for the band to know how many audience they have, but the quality of music is not affected with the number of listeners. As it is physically impossible and contractually difficult (as shown in following text) to exclude potential beneficiaries of intangible assets and as intangibles are nonrivalrous (they subtractability of use is low) they fall into category of public goods. Aspect of low subtractability is persistant, but the aspect of difficulty of excluding potential beneficiaries might be shifted from high to low, which would shift the intangible assets from public goods category to toll goods category. Technological progress can change the means of these exclusion possibilities and therefore it is possible.

4. Intellectual Property Rights as an Institution

Libertarians consider scarcity as fundamental justification for existence of property rights. Hayek (1988) - perhaps the most influential libertarian theorist of 20th century - raised doubts on equation of tangible and intangible resources. Czech professor Šíma (2005) considers intellectual property rights as obstacle to prosperity and suggest, as other Austrian school libertarians, model of intangible assets exchange in contractual freedom based society.

Influential legal thinker of modern times - Richard A. Epstein - who advocates minimal legal regulation, asserts analogies between tangible and intangible property rights (Epstein 2001). His point of view was probably too simplified and misinterpreted by Menell (2007) which triggered Epstein´s (2008) reaction. Misunderstanding might arise from assumption that property rights relies on absolutist conceptions. Property rights absolutism, which is sometimes associated with libertarians, omits societal foundations of property as emphasized by Talmadge (2000). Intangible assets are of various type, as well as material goods (Epstein, 2001, 2008), and it is not completely feasible to lump them together, although it is desirable for necessary simplification.

The market mechanism - as mentioned above in part 2 - does not operate without existence of transaction costs. Their omission is sometimes exploited to simplify explanation of the basic economic principles by mainstream (Zajíček and Zeman, 2007), but this simplification in area of intellectual property rights may lead to misunderstanding of the issue. The exchange of intangible assets would work perfectly in the idealized world without transaction costs – but this model is far from reality. The problem of "trading secret" without transaction costs is like trading a pig in a poke. Buyer cannot find out if the secret is good or bad until he knows it. Parallel to Akerlof (1970) article the good assets may be driven out of the market by the bad assets.

There are uncertainties about potential benefits of the secret for the buyer and risk of disclosure to third parties for the seller who reveals secret before trade happens. This risk can be lowered by contracts, but performance of the contracts should be checked. Every step taken to negotiate contract, to check its observance and to solve disputes in case of its violation might be extremely costly which encourages development of institution which can take a various form. Researcher can keep its secret and start his own business; secret in this case serves as barrier to entrance the new market and provides the monopoly profit. Others want to break the barrier and to get a share of the market. Monopoly tends to tighten rules for keeping the secret to avoid breaking the barrier. But this might increase the deadweight loss[27] or end up with no exchange of intangible assets at all.

The nature of intangible assets leads to their protection by various means. Present form of their protection can be perceived as institution which helps to the owner of IPR to create or maintain barrier and to control the use of intangible assets. Although the historical development of this institution is complicated and sometimes considered as erroneous outcome of the situation influenced by the lobby (Menell, 2000; Šíma, 2004), the current state helps to lower the cost of using market mechanism trough developing rules or general framework for exchange of certain types of intangible assets. My idea would be misunderstood if someone interprets it as the current situation is ideal. I just want to point out, that regulation of market with intangible assets leads to reduction of transaction costs and the intangible exchange without any institutional (private or public) arrangements is not possible.

The most obvious outcome of nowadays IPR arrangement is right to exclude others from unlicensed use of intangible. The essential questions are what intangible should be protected and under what condition should this protection last. The current state of IPR in EU is described in 5th part. The IPR protection is based on assumption of profit impulses of intangible creators. The profit can be gained through licensing right to use intangible or in broader conception by gaining reputation etc… It is expected, that institutional arrangement will encourage creating new ideas, which might

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[27] Some arithmetic on this monopoly creation and destruction can be found in Acemoglu (2009, chapter 12).

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cause increase of productivity and therefore the benefits are enjoyed by the society. Problem is to set ideal level of protection (Posner, 2005) which provides sufficient incentives and avoids ineffective use of resources which might result in infestation of industry by number of IPR and disable cumulative innovation (Shapiro, 2001).

Well known Garrett Hardin´s (1968) article shows various ways to solve the Tragedy of the commons. The tragedy of the commons can be avoided by privatization or by keeping them public and allocating right to use them. Society faces the symmetric tragedy of anticommons (Buchanan and Yoon, 2000) with existence of multiple rights to exclude – which needs to be taken into account while discussing pros and cons of current IPR arrangement. Heller and Eisenberg (1998) point out, that *Privatization of biomedical research must be more carefully deployed to sustain both upstream research and downstream product development. Otherwise, more intellectual property rights may lead paradoxically to fewer useful products for improving human health.* Aoki and Schiff (2010) introduce concept of intellectual property clearinghouses which may prevent the tragedy of anticommons. The effect of these clearinghouses varies according to the market size and other variables. Argue that too much protection is just as undesirable as insufficient protection is usual utilitarian approach which emphasizes difference among intangible assets.

It is difficult to test hypothesis on effects of IPR due to insufficient data. For example Branstetter, Fisman and Foley (2005) tried to tackle the effect of intellectual property rights to international technology transfers, and their results speak in favor of stronger IPR, but are not related to welfare enhancement in technology importing countries. Fiedler and Welpe (2010) examined antecedents of cooperative commercialization to understand collaboration-based commercialization in the context of an emerging technology. Mathematical models were developed to grasp IPR issues. Acemoglu (2009) shows the effect of IPR as entrance barrier on the single market equilibrium model. Landini (2012) introduced the model of software development under the open-source and closed-sources regimes and he explains existence of both. Already mentioned IPR clearinghouses (Aoki and Schiff, 2010) are also explained trough algebraically means. Mentioned models results in existence of optimum under given condition. It is desirable to use IAD framework introduced by Ostrom (2010) to analyze IPR issues in complex way.

5. Intangible assets protected in the Czech Republic

Some types of intangible assets are protected by law. This group of law is called intellectual property law (IPR)[28]. Regulations are not homogenous and they differ according to type of intangible asset. IPR can be divided into copyrights and the area of industrial property rights. Copyright protection covers author´s work (including software in form of source code) and database and it have various forms known as personal property and copyrights.

Industrial property right covers:
   a) technical solutions that are new to the world and industrially applicable – which are protected by patents and utility models (known as small patents);
   b) new solutions to the appearance of products and the results of creative activites in the area of industrial design – which are protected trough entry of industrial designs into the register;
   c) visual and graphical solutions which serve to distinguish products or services of the same type from different producers – they are protected by trademarks;
   d) other specific intellectual rights such as protection of plant varieties, and appellations of origin and geographical indications.

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[28] If we consider also the human personality as an intangible asset – we have to mention that another set of law is intendet to its protection (e.g. Charter of Fundamental Rights and Freedoms).

Each segment of IPR is specific. Segments differ mainly in conditions necessary for the establishment of protection, and length and conditions for the duration protection. Intellectual property rights are of territorial nature but trend to harmonize them is backed up by world intellectual property organization (WIPO).
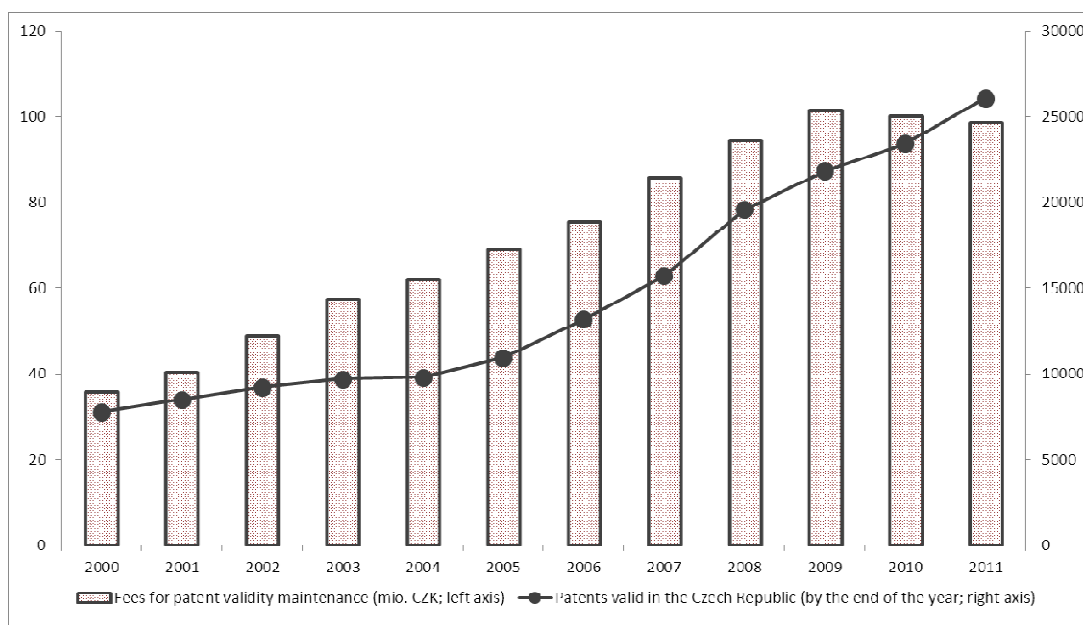
Fig. 1. Extent of patent protection in the Czech Republic during 2000 – 2011 (Source: Industrial Property Office of the Czech Republic, 2000 – 2011; own adaptation).

Extend of patent of patent protection is increasingly growing in the Czech Republic in recent years as we can see in Fig. 1. Maintenance fees paid to Industrial Property Office of the Czech Republic are shown for CZ patents. The amount of patents valid in the Czech Republic more than tripled during past decade. The average annual growth rate was 11.6 %. In the end of 2011 were 26081 valid patents in the Czech Republic.
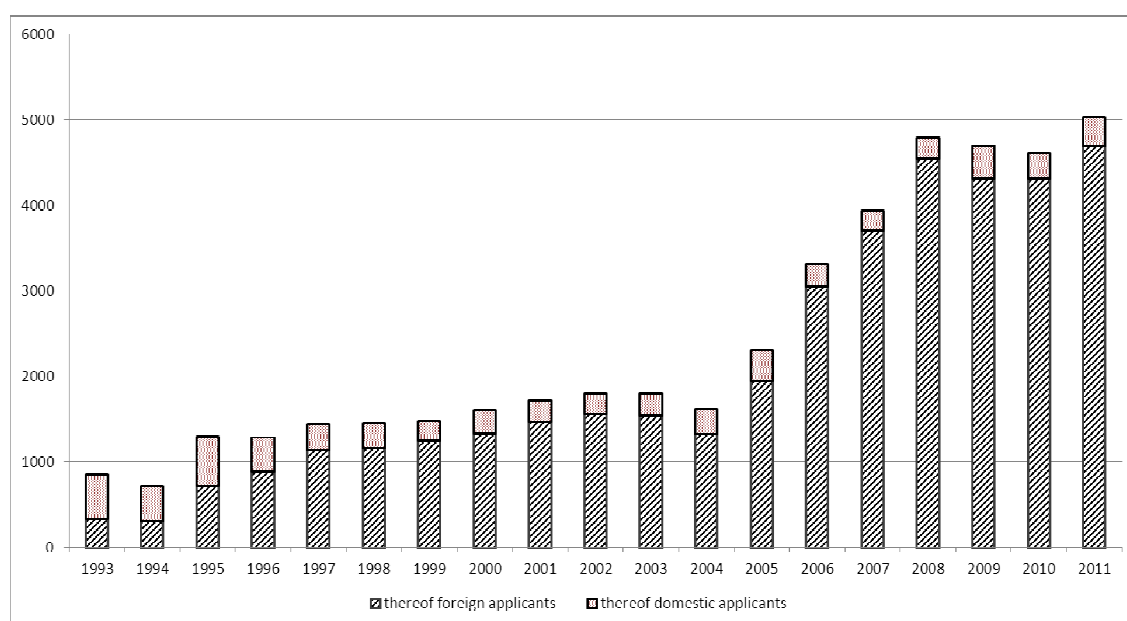
Fig. 2. Granted national patents and granted European patents having effect in the Czech Republic (Source: Industrial Property Office of the Czech Republic, 2000 – 2011; own adaptation).

Applicant for patent protection is appropriate to let the patent validated in all states that represent potential outlets. For each country in which the invention is protected is additional fee paid. Maintenance fees are paid well for each country separately. In the last two decades we can observe a significant increase in applications of foreign entities and patents granted. This is due to the harmonization of IPR and market integration.

In 1993 and 1994 the share of domestic applicants who were granted a patent on the total number of patents granted 61% and 58%. In subsequent years, however, dramatically increased the number of foreign patents (average growth rate for the period is 16.5%). While the number of domestic applicants in the period fell by an average 2.5% annually. In 2011 was awarded a total of 5035 patents which have effect in the Czech Republic, only 339 of them were granted domestic applicants. The largest increase can be observed in Fig. 2 in the context of 2004 EU enlargement.

It is hard to tell whether the extent of IPR is beneficial for the Czech Republic or not. It might influence innovation activities in two channels. First - the developing system of IPR protection gives confidence in the protection of inventor's inventions from unauthorized use – which might create positive incentives. Second – as current knowledge stands on the shoulders of our ancestors the overprotected IPR might slower the development and lead to inefficient allocation of resources – which might cause R&D activities ineffective and produce another type of transaction costs – in this case the costs of dealing with IPR. Rules for public domain use – especially for government funded research, as well as idea of IPR clearinghouses as introduced by Aoki and Shiff (2010) might be given special attention.

6. Conclusion

If we understand IPR protection as an institution which arises to reduce transaction cost among inventors, entrepreneurs, producers and other entities which are included in transaction of objectively materialized intangible assets, we might see the reduction of transaction costs of the "first wave" inventions, but also the increase of the transaction costs of "second and other waves". To produce new technologies are the previous one needed – usually combination of most of them. In this case, where the multiple rights to exclude exist can the tragedy of anticommons occur - to produce new Smartphone one need to purchase license to multiple patents, utility models and industrial designs from various IPR holders. The way they set a price might result in case, that new producer will give up, because all those licenses create entrance barrier in form of production cost.

In the case that IPR are protected strongly, can situation of anticommons happen – no one would want (would be able) to buy multiple rights. On the other hand in case that IPR wouldn't be protected, thy symmetric tragedy could occur. If secret (invention) to be told cannot be sold, than it might not be told at all. Both above mentioned are extremes, which would not arise in real world, because relation among individual motives is not linear.

Basically introducing IPR into the legal framework solves "one" problem and creates "another". The intangible assets should not be homogenized, and the IPR problem should not be taken as state vs market as the question shouldn't be put in a way: IPR – yes or not. More likely we should ask how to do it more effectively.

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ECONOMIC FREEDOM AND NATIONAL COMPETITIVENESS: EVIDENCE FROM THE VISEGRAD COUNTRIES

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Abstract. The main goal of this paper is to verify whether economic freedom and economic growth tend to increasing national competitiveness. Competitiveness of nations is a framework that has become one of the most used words by economist and politicians. Nonetheless there are lots of definitions and approaches. Authors apply comprehensive and established indicator the Global competitiveness index published by the World economic forum. Since the time of Adam Smith economic freedom is one of the crucial factors for economic progress. Economic freedom is measured by comprehensive indicator the Index of economic freedom provided by the Heritage Foundation. Visegrad countries were included to panel data model used to investigate the influence. We found out economic freedom and one period lagged growth rate of real GDP foster national competitiveness.

Keywords: economic freedom, national competitiveness, economic growth, panel data model.

JEL Classification: O47, C23.

1. Introduction

National competitiveness is a framework that has become one of the most used and vogue word in today's globalized world during the last thirty years. Nevertheless there are many definitions and concepts of national competitiveness and hence there is not only one approach. Scott and Lodge (1985) refer competitiveness as country's ability to create, produce, distribute, and service products in international trade while earning rising returns on its resources. Interesting attitude has Krugman (1994), who likened competitiveness of nations to a dangerous obsession. According to Porter (1998) the only meaningful concept of national competitiveness is national productivity (e.g. Schwab, 2011 is based on that approach). Önsel et al. (2008) and Oral (1999) refer to internal company capacity while national competitiveness relates to the relative position to its competitors. Some authors link national competitiveness with economic growth, e.g. Beneš (2006) or Hančlová et al. (2010). Aiginger (1998) summarizes that defining the competitiveness of nations is a controversial issue.

Cultural norms and institutions are often believed to explain why certain countries grow and other remain poor (Landes, 1998). Since the time of Adam Smith economists have pointed out that the freedom to choose and supply resources, competition in business, trade with others and secure property rights are fundamental factors for economic progress (North and Thomas, 1976).

There is a lot of literature about the relationship between economic freedom and economic growth. The studies generally confirm the positive link, e.g. Barro (1994), Gwartney, Lawson and Holcombe (1999), Haan and Sturm (2001), Adkins, Moomaw and Savvides (2002) find that positive changes in economic freedom lead to economic growth, notwithstanding the level of economic freedom in the beginning of the growth period does not contribute significantly to explaining growth. Haan and Siermann (1998) argued that the link between economic freedom and economic growth depends upon the measured use. Haan and Sturm (2000) have constructed their own indicator based on below mentioned indices. They found out greater economic freedom fosters economic growth; however the level of economic freedom is not related to growth. The main lack of these studies is applying correlation analysis only without influence other variables. Doucouliagos and Ulubasoglu (2006) confirmed already mentioned positive and statistically significant association between economic

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growth and economic freedom by means of panel data analysis. They also show that specification issues matter. Herciu and Ogrean (2011) argue that economic freedom, knowledge economy and global competitiveness are three of the many and very different dimensions which characterize the level of a country's performance.

The aim of this paper is to verify the link from economic freedom and economic growth to national competitiveness. Competitiveness expresses the ability, activity; whereas gross domestic product covers output of the economy. Hence competitiveness fosters economic growth; however economic growth promotes competitiveness in next periods. The evaluation will be carried out by means of panel data analysis.

The remainder of the paper is structured as follows. Section 2 deals with practical measuring of economic freedom and competitiveness of nations. Section 3 shows examined data and evaluating procedure, while section 4 presents our estimation results, the final section sum up the main results.

2. Measuring economic freedom and national competitiveness

There are lots of possibilities to measure economic freedom and national competitiveness. We focus on some provided by international institutions. The Fraser Institute and The Heritage Foundation deal with economic freedom. The Fraser Institute by means of Gwartney, Lawson and Block (1996) defines economic freedom for individuals when property they acquire without the use of force, fraud, or theft is protected from physical invasions by others and they are free to use, exchange, or give their property to another as long as their actions do not violate the identical rights of others. Hence, an index of economic freedom should measure the extent to which rightly acquired property is protected and individuals are free to engage in voluntary transactions. Furthermore Gwartney, Lawson et al., (2011) emphasize the crucial factors of economic freedom: (i) personal choice, (ii) voluntary exchange coordinated by markets, (iii) freedom to enter and compete in markets, (iv) protection of persons and their property from aggression by others. The Fraser Institute has published its annual report since 1996 every year.

The Heritage Foundation defines the economic freedom similarly to previous one (Miller, et al., 2012) is the fundamental right of every human to control his or her own labor and property. In an economically free society, individuals are free to work, produce, consume, and invest in any way they please with that freedom both protected by the state and unconstrained by the state. In economically free societies, government allows labor, capital and goods to move freely, and refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself. The Heritage Foundation has calculated index of economic freedom and published its annual report with studies about economic freedom since 1995. Index consists of ten components:

- property rights,
- freedom from corruption,
- fiscal freedom,
- government spending,
- business freedom,
- labor freedom,
- monetary freedom,
- trade freedom,
- investment freedom,
- financial freedom,

which are grouped into four categories: (i) rule of law, (ii) limited government, (iii) regulatory efficiency and (iv) open markets (for more details see Miller, et al., 2012). The range of the index is from 0 to 100, where 100 represent the maximum economic freedom.

Countries with an index of economic freedom between:

- 0 – 49.9   are repressed,
- 50 – 59.9   are mostly unfree,
- 60 – 69.9   are moderately free,
- 70 – 79.9   are mostly free,
- 80 – 100   are free.

According to index of economic freedom Visegrad countries are moderately free in period except for the Czech Republic in the last year (mostly free, 70.4).

In time of economic growth a lot of economists will agree with principles of economic freedom, the key question is, what should economists suggest and policy makers do in time of economic stagnation or recession. The recent recession should be appropriate example. Should government regulate economy, it does argue Krugman (2012) or Šikula (2011). The government of the United States performed measures that correspond to Keynesian approaches (Švejnar, 2009). On the contrary, the other group of economists argues that government and central bank should minimize their efforts into the economy (Mises, 2006).

The index of economic freedom decreased, especially in government spending in V4 countries in 2009. The decline is related to V4 countries' government proposals and regulation.

There are some institutional approaches to national competitiveness, e.g. The Institute for Management Development or the well-known World Economic Forum (WEF). WEF has published its annual Global competitiveness report since 1979 which analyzes and evaluates competitiveness. WEF (Schwab, 2011) define national competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country. Index consists of twelve pillars which involve over than 300 criteria.

3. Data and econometric methodology

The Heritage Foundation Index of economic freedom was used as a proxy variable of economic freedom, Global competitiveness index of national competitiveness and annual growth rate of gross domestic product at constant prices (2005) as a proxy of annual growth rate of real gross domestic product (GDP). We employ annual data for Visegrad countries (Czech Republic, Hungary, Poland and Slovakia) between 2005-2011. The starting year is limited because of global competitiveness index was set up.

The Global competitiveness index was standardized according to formula (1) to range 0 – 1 thus we can express the value in per cent:

$$x' = \frac{x_j - {}_{min}x_j}{{}_{max}x_j - {}_{min}x_j} \tag{1}$$

where x' denotes the new value of the global competitiveness index, x initial value, ${}_{min}x$ the minimum value, i.e. 1 and ${}_{max}x$ the maximum value, i.e. 7.

To examine the above mentioned relationship we perform panel data analysis. Panel data (or longitudinal data) cover both a time series and a cross-sectional dimension compared to pure time series or cross-sectional data (Wooldridge, 2002). Panel data models have become more and more popular among researchers because of their capacity for capturing the complexity of human behavior as contrasted to cross-sectional or time series data models (Hsiao, 2003). Klevmarken (1989), Hsiao (2003) and Baltagi (2005) list a number of panel data's benefits, e.g. (i) controlling for individual heterogeneity, (ii) give more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency, (iii) are better able to study dynamics of adjustment, (iv) are better capable to identify and measure effects that are simply not detectable in pure

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cross-section or pure time series data, (v) allow to construct and test more complicated behavioral models than purely cross-section or time series data and thus allow a researcher to analyze a number of important economic questions that con not be addressed using one dimensional data, and limitations, e.g. (i) design and data collection problem, (ii) distortions of measurement errors or (iii) selectivity problem.

A panel data set is formulated by a sample that contains N cross-sectional units (individuals, firms, households, countries etc.) that are observed at different time periods T (Asteriou and Hall, 2007), i.e. $N = 4$ and $T = 7$ in our case. Simple linear panel data model can be written as (2):

$$y_{it} = \alpha + \beta X'_{it} + u_{it} \qquad (2)$$

where y represents the dependent variable, X vector of explanatory variables and subscript i denotes cross-section dimension (V4 countries) whereas t time series dimension (2005-2011), α, β are coefficients and u is a random disturbance term. In general, three different methods can be used to estimate linear panel data models by means of ordinary least squares: (i) common constant as in equation (2), (ii) fixed effects and (iii) random effects. The common constant method implies that there are no differences among variables of the cross-sectional dimension, so-called homogenous panel. Fixed or random effects allow us to capture the differences among units; hence the random disturbance term u is given by (3):

$$u_{it} = \mu_i + v_{it} \qquad (3)$$

where μ_i denotes unobservable individual-specific effect which is time-invariant and is responsible for any individual-specific effect that is not contained in the regression. The random disturbance term u from (2) is sometimes expressed as so-called two-way error component (4):

$$u_{it} = \mu_i + \lambda_t + v_{it} \qquad (4)$$

where λ_t represents individual-invariant and it accounts for any time-specific effect not included in the regression. In case of fixed effect it is assumed to be fixed parameters to be estimated whereas in case of random effect it is assumed to be random and v_{it} denotes remainder disturbance which varies over individuals and time (Baltagi, 2005; Hsiao, 2003). But the question, which model is more appropriate still remains. For common constant and fixed effect model we can apply standard F-test under the null hypothesis (H_0 thereinafter) that all the constants are the same (Asteriou and Hall, 2007). In random effect model we assume zero correlation between explanatory variables and the unobserved effect. Hausman test (1978) is employed to find out if this assumption is fulfilled under H_0: random effects are consistent and efficient.

Moreover, it should fulfill the assumptions for standard ordinary least squares error terms, i.e. the remained disturbance is homoskedastic, serially and spatial uncorrelated. In particular, to avoid spurious regression and misleading conclusions we need to find out, if the panel data are stationary or non-stationary. There are a few methods to find out the data stationary or non-stationary. For homogenous panel data we employ Levin, Lin and Chu (2002) under the H_0: each individual time series contains unit root (non-stationary) against alternative hypothesis that each time series is stationary. Maddala and Wu (1999) proposed alternative approach for panel data based on Fishers's (1932) results. This method tests H_0: each individual time series contains unit root against the alternative hypothesis for at least one time series is stationary. All necessary tests are performed at the 5 per cent significance level.

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4. Empirical results

In this section we present and discuss the results from balanced panel data regression model in the case of Visegrad countries. At first we estimate step by step all three models by means of least squares method. In compliance with goal of this paper we examine the relationship among economic freedom and lagged growth rate. According to above mentioned tests the fixed effect model seems to be the most appropriate model to identify the link among economic freedom (*ef*) and annual growth rate of real GDP (*gdp*) as the explanatory variables and competitiveness (*compet*) as a dependent variable (5):

$$compet_{it} = \alpha + \beta_1 ef_{it} + \beta_2 gdp_{it_{-1}} + \mu_i + \nu_{it} \tag{5}$$

The coefficient of determination (R^2) = 0.57, annual growth rate of real GDP and economic freedom explains about 57 per cent of the variation in competitiveness for V4 countries (adjusted coefficient of determination = 0.47). The regression model and coefficients are significant at 5 % significance level. The remained disturbance ν_{it} fulfills the assumptions for used methods. The Maddala and Wu (1999) test for unit root was carried out and at least one of time series is stationary, thus all of panel data are stationary.

When we estimate (5) for each country we get (6) for the Czech Republic, (7) for the Hungary, (8) for the Poland and (9) for the Slovakia. The unobservable country-specific effect μ_i is represented by changes in intercept.

$$compet_{CZ,t} = 27.74 + 0.46.ef_{CZ,t} + 0.19.gdp_{CZ,t-1} \tag{6}$$

$$compet_{HU,t} = 25.11 + 0.46.ef_{HU,t} + 0.19.gdp_{HU,t-1} \tag{7}$$

$$compet_{PL,t} = 26.25 + 0.46.ef_{PL,t} + 0.19.gdp_{PL,t-1} \tag{8}$$

$$compet_{SK,t} = 22.93 + 0.46.ef_{SK,t} + 0.19.gdp_{SK,t-1} \tag{9}$$

The estimated coefficients and signs are in accordance with expectations. The intercept represent the differences among countries. Signs indicate positive link of economic freedom and growth rate of GDP to competitiveness. Increasing in economic freedom about 1 percentage point will cause increasing in competitiveness about 0.46 percentage points in the Czech Republic (ceteris paribus). Similarly, 1 more percentage point of growth rate from previous period is associated with raising the national competitiveness about 0.19 percentage points in the Czech Republic (ceteris paribus).

5. Conclusion

This paper dealt with the national competitiveness, economic freedom and economic growth rate. Its goal was to verify the positive link of economic freedom and growth rate to competitiveness at national level. We employed index of economic freedom as a proxy of economic freedom, global competitiveness index as a proxy of national competitiveness and annual growth rate of real gross domestic product of Visegrad countries from 2005 to 2011. We applied panel data model using least squares method. The cross-section fixed effect model seemed to be the most appropriate model to identify the link among economic freedom and annual growth rate of real GDP as the explanatory variables and competitiveness as a dependent variable. The investigation process was performed in accordance with economic theory and model assumption. We found out economic freedom and one period lagged growth rate of real GDP foster national competitiveness in all of the Visegrad countries.

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THE ISSUE OF USING TAX QUOTA IN THE GROWTH EMPIRICISM

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Abstract. Tax quota is one of the most applied indicators of tax burden in macroeconomic models, especially in the models of long-term economic growth. Its use, however, has a number of shortcomings. Thus the aim of the paper is to show whether the tax quota is a suitable approximator of tax burden or not. For the comparison, the World Tax Index (WTI) is used, which is an overall multicriteria indicator that combines hard and soft data to express the real tax burden of economic entities. The results of panel data estimations show that the tax quota is not suitable for tax burden approximation, especially in case of corporate taxes and value added type taxes. They also show that corporate tax burden negatively influence long-term economic growth, as suggested by economic theory.

Keywords: tax quota, World Tax Index (WTI), corporate income tax, value added tax, economic growth, panel data estimation.

JEL Classification: O40, H20, C50.

1. Introduction

In modern society, the existence of redistribution processes is essential. However, the rate of taxation, which reflects it, varies considerably in different countries, both in absolute terms and particularly in the tax structure. The size of taxation or government spending is regularly incorporated in growth theories, as long-term economic growth significantly affects a key economic characteristic: the standard of living of the population. Properly adjusted tax environment creates a positive climate for achieving key goals of economic policy which also includes optimal economic growth (Kotlán, 2001).

By far, the most widely used approximator of the tax burden is the tax quota, i.e. the percentage of tax revenues in nominal product. Implicit tax rates, e.g. at the European Union level, are another option. However, they are fundamentally similar to the tax quota. Alternative indicators, such as effective tax rates calculated in different ways play a rather marginal role. The fundamental problem of indices such as the tax quota is the use of tax revenues as a reflection of the tax burden. Even simple tax theory, however, postulates that the line between the tax burden and tax revenues may not be unambiguous and a higher tax burden may not lead to higher tax revenues. The approximation of the tax burden through the tax quota may, therefore, not be realistic. A high tax burden can result, as shown by the Laffer Curve, in lower tax revenues.

Current growth theory, which integrates the size of taxation through its effect on growth variables, especially on savings or investments, the size of capital or technological progress, is often challenged in empirical verification and presumed hypotheses about the negative impact of taxation on long-term economic growth are not confirmed, nor is the negative effect of certain taxes. One of the most problematic taxes in this area is corporate tax. The use of more appropriate tax burden approximators than the tax quota seems necessary.

The aim of this paper is to evaluate the impact of taxation on long-term economic growth using not only the tax quota but also an alternative tax burden indicator - the World Tax Index (WTI), and to show whether the tax quota is a suitable approximator of tax burden or not.[29]

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[29] From the methodological point of view, an ontological approach is used, as described in Kotlán (2008).

2. Taxation in growth theories

The development of growth theories is particularly due to the massive empirical verification of the late 1980s and 1990s. Nevertheless, it can be connected mainly with earlier pivotal studies of Solow (1956) and Swan (1956), who were developing the neoclassical growth model. This model presumes that sooner or later, the economy reaches a steady state in which GDP growth per worker (that is, in essence, the living standard) is only affected by exogenous factors such as technological progress and population growth rate. According to the conclusions of the neoclassical growth model, economies that are already in the steady state are faced with a situation whereby the tax or fiscal policy are unable to influence the growth rate per capita. Consequently, such a policy affects the standard of living only temporarily in the period between steady states. Assuming that particularly developed economies are in the steady state, the tax policy may only have a negligible effect on the rate of output growth per worker in these models. For more details, see e.g. Barro and Sala-i-Martin (2004).

In endogenous growth models that were developed, especially by Lucas (1988) and Romer (1986), a different mechanism is used, according to which the tax policy may affect the growth of output per worker not only between permanent states, but also in the steady state. Therefore, the mechanism has a tier as well as a growth effect. Aschauer (1989) suggests that, in a steady state, taxation can have a demonstrable impact on long-term growth. Kneller, Bleaney and Gemmell (1999), on the other hand, believe that taxation has no significant effect on steady state growth.

If we integrate taxation in the growth models, this is done through its impact on the individual growth variables. A key neoclassical growth factor is the rate of savings, investment and the subsequent capital accumulation. The impact on final investment activities can be seen in several ways. In particular, it is the negative effect of taxation on investment activities, with special attention to FDI. Corporate tax and dividend taxation are of particular importance. Recent studies include Buettner and Wamser (2006), Keuschnigg (2009), or Santoro and Wei (2009). A very important factor affecting investment is the taxation of labour, which leads to a decline in investment activity due to pressures on corporate profits (e.g. Alesina et al., 1999). Indirect taxes seem to be equally important. Higher consumption tax through VAT or selective excise taxes has similar negative effects as labour tax (e.g. Salanié, 2003).

In the extended neoclassical growth model, the size of human capital is a very important variable that modifies the conclusions of the original Solow model (1956). It is the influence on convergence to a steady state in a particular country as well as in economies to each other, and thus on long-term economic growth. Most studies agree that the effect of taxation on human capital is negative, subject, however, to different effects of individual taxes, as well as to the varying influence of specific public expenditure (investment) in human capital. There is a clear link between the amount of investment in human capital and the rate of labour tax, or its progressiveness. The time period also seems to be of importance. For longer-term investment decisions in human capital, the effect of taxation is more pronounced. With increasing taxation of labour or a higher degree of progression, the return on investment in human capital declines and taxation is thus shown to be negative (e.g. Erosa and Koreshkova, 2007, or Hendricks, 2004). The relation between the taxation of labour and common capital seems to be of particular importance. The problem pertains in particular if labour income is taxed at a higher rate than capital (e.g. Jacobs and Bovenberg, 2010).

3. The structure of the alternative indicator of tax burden

The use of alternative indicators of the tax burden allows capturing the impact of increased tax burden on long-term economic growth and living standard in a more realistic manner. A particular advantage seems to be the fact that they eliminate the problematic relationship between the burden and tax quota. Among the disadvantages are a rather difficult structure and shorter time series, which may

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limit the number of degrees of freedom in econometric analyses, and therefore the credibility of the statistics tested.

3.1 Tax quota and its specifications

The tax quota is the basic indicator used to measure the tax burden. It is expressed as a percentage share of tax revenues to nominal gross domestic product. It can be followed either as an overall ratio, or separately for individual taxes. The primary advantage is the simplicity of its design and the accessibility for a wide sample of countries over a relatively long period. For these reasons, it is almost exclusively used in comparative studies as well as econometric analyses.

The fundamental, although not frequently mentioned, disadvantage is that the tax quota may in fact say nothing about the real level of the tax burden. That is due to the fact that there may be no demonstrable correlation between the effective tax burden and tax returns. As follows from the elementary Laffer curve (Laffer, 2004), the relationship between the level of the effective tax burden, as described, e.g. by the nominal tax rate on the one hand and tax revenues on the other hand, changes dramatically over time and, in addition, is obviously non-linear. At a relatively low tax burden, there may be a direct proportion between the level of the tax quota and tax revenues; however, with decreasing marginal return when further increasing the tax rate. From a certain taxation level, however, the proportion changes and the link become inversely proportional. Increasing the tax burden does not increase tax revenues (and, in turn, the tax quota). Conversely, it reduces them. Another, rather marginal, disadvantage of the tax quota is that it uses the GDP indicator, which may be statistically unreliable or to varying degrees include the grey economy in different countries, etc. Rather than an indicator of the tax burden, the tax quota is seen as the part of the GDP, which is redistributed through taxes. The issue of the tax quota and its use in macroeconomic models is dealt with in more detail in, inter alia, Szarowska (2010), Johansson et al. (2008), or Arnold (2008).

Implicit tax rates which do not relate tax revenues to GDP, but to the type of activity and commodities associated with the taxes, seem to supplement the tax quota, rather than represent an alternative. It is therefore an analysis of the impact of the tax burden on activities according to their function (capital, labour and consumption). The drawback of implicit tax rates is that they are credibly and comparably collected only for EU countries, thus being irrelevant for the analysis of the OECD as a whole. The above disadvantages of the tax quota apply to the implicit tax rates as well. For more information on the issue of implicit tax rates, see, e.g. Zechner and Swoboda (1986), or Walden (1996).

3.2 Alternative tax burden index - the WTI

The World Tax Index (WTI) is an overall multi-criteria indicator of the tax burden, combining data on tax conditions available from internationally-recognized data sources, with data expressing a Qualified Expert Opinion (QEO). The index value indicates the overall tax burden in relation to other countries under coverage, with higher WTI values representing a higher tax burden.[30]

The concept of the tax burden, with regard to the WTI, does not apply only to the amount of taxes collected and links to the GDP, as is the case for the aforementioned tax quota. It seeks to expand its scope by incorporating other important aspects associated with, e.g. tax progression, the administrative difficulty of tax collection from the perspective of the payer, the range of tax exemptions, options concerning the tax deductibility of expenses, etc.

4. Methodology for constructing the WTI

In the countries under coverage, the WTI as a whole represents more than 95 % of the OECD tax mix, while the remaining part of the tax mix relates to other taxes that are so specific in each country that

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[30] The WTI was constructed by team led by authors.

their comparison is virtually impossible. The WTI thus covers a substantial part of the tax burden in each country and can be considered an overall tax index.

The WTI is composed of the following five sub-indices:

- Corporate Income Tax (CIT, the relative level of tax burden with respect to corporate taxation),
- Personal Income Tax (PIT, the relative level of tax burden with respect to household taxation),
- Value Added Tax (VAT, the relative level of tax burden with respect to a VAT-like tax),
- Individual Property Taxes (PRO, the relative level of tax burden with respect to property taxes),
- Other Taxes on Consumption (OTC, the relative level of tax burden with respect to other excise taxes).

Each of the individual sub-indices is also the result of several factors; therefore, the sub-indices also further break down into several components, as shown in Table 1.

Table 1. WTI sub-indices and their components.

A) Corporate Income Tax (CIT)	D) Individual Property Taxes (PRO)
A1) Nominal Tax Rates	D1) Net Wealth Tax
A2) Progressivity	D2) Real Estate Tax
A3) Incentives	D3) Inheritance Tax
A4) Tax Deductibility of Costs	D4) Gift Tax
A5) Administration	D5) Other Property Taxes
B) Personal Income Tax (PIT)	E) Other Taxes on Consumption (OTC)
B1) Nominal Tax Rates	E1) Beer
B2) Progressivity Rate	E2) Wine
B3) Personal Deductions	E3) Alcohol
B4) Social Security Contributions	E4) Tobacco
B5) Administration	E5) Mineral Oils
C) Value Added Tax (VAT)	
C1) Standard Tax Rate	
C2) Reduced Tax Rate	
C3) Registration Duty	
C4) Exemptions	

Source: own elaboration.

As already mentioned, both hard and soft data from the QEO are used in the calculation of the WTI. It was obtained through an extensive questionnaire survey, carried out among tax specialists[31] from all OECD countries. The aim was to find out the weight of individual sub-indices and their components for further calculations. The survey respondents had to distribute 100 % for each sub-index among its components, depending on their contribution to the tax burden in each country, with a higher percentage meaning a higher tax burden. The average percentage given to the component for each country determined, in turn, its weight in the respective sub-index.

The hard data (e.g. tax rates, progression rate, number of hours required for filing the tax declaration form, etc.) which was used for the calculation, varied significantly as to scales, and was therefore standardized prior to the calculation, i.e. converted to a scale from 0 to 1 according to the following equation:

$$X_s = \frac{X_i - X_{min}}{X_{max} - X_{min}}, \tag{1}$$

where X_s is the standardized value, X_i is the value for the i-th country, X_{min} is the minimum value and X_{max} the maximum value of the values from the countries covered. Zero was then assigned to the

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[31] The respondents' selection criterion was the number of publications and citations related to the issue of taxation in Scopus database or the recommendations of these authors.

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figure representing the lowest value before the standardization, and one was assigned to the highest value of all the values in the group before standardisation.

The individual sub-indices were then calculated as:

$$S_k = \sum_{i=1}^{N} \left(X_{S_i} \frac{QEO_i}{100} \right),$$ (2)

where S_k is the value of the k-th sub-index, X_{si} is the standardized value of the i-th component of the sub-index and the QEO weight resulting from the QEO for i-th component. N is the number of components of the sub-index.

The weights of the actual sub-indices were determined on the basis of the Saaty method of pair-wise comparisons (see e.g. Saaty, 2008) carried out by the survey respondents. The method is based on comparing all pairs of criteria with regard to the defined objective according to their importance. The respondents thus compared all pairs of sub-indices with regard to their importance to the tax burden in the country, where greater importance also indicated a higher tax burden, using a three-point scale to express the degree of importance.

The summary index of WTI was then calculated from 5 sub-indices as:

$$WTI = \sum_{k=1}^{5} \left(S_k \frac{QEO_k}{100} \right),$$ (3)

where QEO_k is the weight defined on the basis of the QEO for the k-th sub-index.

For more details on the construction of the WTI, see Kotlán and Machová (2012a).[32]

4.1 WTI data

The resulting values of WTI for individual OECD countries are summarized in Table 2. These are average values for the years 2005-2010. The indicator ranges on a scale from 0 to 1, where 0 is the minimum tax burden and 1 the maximum tax burden on businesses. With regard to this index, the lowest tax burden was found in Ireland, Switzerland and Australia, where the WTI does not exceed 0.3. They are followed by countries such as Canada, the United Kingdom, Estonia, and also the Czech Republic, where the WTI value is 0.36. On the other hand, the highest tax burden was seen in Turkey, Belgium, Norway, Denmark and the Netherlands. Table 2 also shows the level of the tax quota in each country, which demonstrates the ratio of tax revenue to GDP. In this case, Ireland and Switzerland are the countries with a relatively low tax burden and, conversely, Belgium or Norway are among the countries with a higher tax burden.

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[32] For the input data, methodology, calculation of the WTI including its sub-indices, see World Tax Index – WTI (2012).

Table 2. WTI values and tax quota (% GDP).

Country	WTI	Tax quota	Country	WTI	Tax quota
Australia	0.29	28.31	Japan	0.55	27.79
Austria	0.51	42.13	Korea	0.38	25.44
Belgium	0.63	43.90	Luxembourg	0.43	36.48
Canada	0.32	32.47	Mexico	0.38	18.40
Chile	0.52	21.75	Netherlands	0.55	38.72
Czech Republic	0.36	36.23	New Zealand	0.34	33.99
Denmark	0.58	48.95	Norway	0.62	43.27
Estonia	0.33	32.39	Poland	0.36	33.55
Finland	0.48	43.06	Portugal	0.44	31.65
France	0.50	43.48	Slovak Republic	0.37	29.50
Germany	0.53	36.12	Slovenia	0.50	37.79
Greece	0.36	31.23	Spain	0.35	34.21
Hungary	0.54	38.76	Sweden	0.43	47.25
Iceland	0.46	38.27	Switzerland	0.26	29.29
Ireland	0.26	29.63	Turkey	0.96	24.61
Israel	0.46	34.24	United Kingdom	0.31	35.54
Italy	0.49	42.70	United States	0.39	26.36

Source: own elaboration.

For some countries, however, their status, as shown by the two indicators, is completely different. These are primarily Turkey, Chile, Japan, but also Sweden or the United Kingdom. In all cases, the differences are mainly due to the different results of the tax burden on corporations, as expressed by the CIT sub-index or the corporate tax quota. In other words, the inclusion of such factors affecting the tax burden on corporations, such as administrative difficulty of taxation or the options concerning the tax deductibility of costs (see Table 1), seems to fundamentally impact the resulting tax burden. The values of CIT and the corporate quota are shown in Table 3. It also summarizes the average values of PIT and the relevant tax quota in the reference period. In this case, unlike the CIT, the position of countries in terms of the relevant indicators is not fundamentally different. Similarly, this was also the case for the other sub-indices and the relevant quotas (see below).

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Table 3. Values of selected sub-indices and the relevant tax quota (% GDP).

Country	WTI CIT	CIT quota	WTI PIT	PIT quota	Country	WTI CIT	CIT quota	WTI PIT	PIT quota
Australia	0.05	5.93	0.14	10.69	Japan	0.36	3.84	0.12	5.32
Austria	0.06	2.15	0.23	9.46	Korea	0.22	3.80	0.05	3.77
Belgium	0.03	3.16	0.29	12.41	Luxembourg	0.04	5.32	0.27	7.52
Canada	0.06	3.49	0.25	11.70	Mexico	0.14	.	0.06	.
Chile	0.02	.	0.11	.	Netherlands	0.07	3.10	0.25	7.62
Czech Republic	0.08	4.27	0.08	4.00	New Zealand	0.07	4.76	0.17	13.79
Denmark	0.05	3.42	0.30	25.17	Norway	0.07	11.20	0.10	9.70
Estonia	0.04	1.56	0.15	5.71	Poland	0.03	2.53	0.12	4.76
Finland	0.05	3.10	0.20	13.14	Portugal	0.06	3.10	0.09	5.52
France	0.08	2.49	0.12	7.55	Slovak Republic	0.07	2.80	0.14	2.53
Germany	0.11	1.82	0.27	8.93	Slovenia	0.04	2.53	0.22	5.71
Greece	0.08	2.68	0.10	4.86	Spain	0.06	3.24	0.17	6.88
Hungary	0.04	2.23	0.22	7.16	Sweden	0.04	3.41	0.18	14.28
Iceland	0.03	2.04	0.23	13.47	Switzerland	0.03	3.07	0.17	9.53
Ireland	0.01	3.06	0.14	8.19	Turkey	0.41	1.73	0.10	3.86
Israel	0.04	3.76	0.13	7.26	United Kingdom	0.02	3.34	0.19	10.50
Italy	0.09	3.29	0.27	11.22	United States	0.16	2.65	0.15	9.38

Note: . = missing values.
Source: own elaboration.

4.2 Correlation of WTI and tax quota

The WTI values calculated for each country were used in further analysis as input values for the correlation analysis with the tax quota, aimed to verify the suitability of the tax quota as an indicator of the tax burden. However, the correlation was determined for both the WTI as a whole and for its sub-indices in relation to the tax quotas.

The correlation analysis was performed using the Spearman's rank correlation coefficient, which allows working with variables whose values are on different scales, as instead of the actual values, it uses the ranking of countries under comparison with regard to these values. It can be calculated as:

$$r_s = 1 - \frac{6\sum_{i=1}^{n} d_i^2}{n(n^2-1)}, \tag{4}$$

where d_i represents the differences in the order of pairs of values of the quantities, n is the number of these pairs of values and r_s is the Spearman's rank correlation coefficient. The coefficient ranges between <-1, 1>, where $|r_s| = 1$ means a complete dependence of the order, $r_s \in (0, 1)$ represents corresponding order and $r_s \in (-1, 0)$ means an inverse order of values. $r_s = 0$ expresses non-correlated values.

In the case of the WTI as a whole, a positive correlation with the tax quota has been demonstrated with a correlation coefficient of 41.4 %, where the correlation is statistically significant at a 5 % significance level. Further analysis focused on which of the WTI sub-indices causes the relatively low degree of correlation, and which increase the correlation.

It was found that PIT, VAT, or PRO show positive correlation with the relevant tax quotas (share of revenue from personal income tax, VAT, or property taxes on the GDP) at a significance level of

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1 %, with the correlation coefficients reaching 64.5 %, 55.8 %, and 47.4 %, respectively. A statistically significant correlation (at 5% significance level) was also found for OTC, where the correlation coefficient reached a value of 36.1 % (see Table 4).

Table 4. Spearman's rank correlation coefficient (r_s) with a tax quota for the WTI and individual sub-indices.

	WTI	CIT	PIT	VAT	PRO	OTC
r_s (%)	41.4**	-0.5	64.5***	55.8***	47.4***	36.1**

Note: ** Statistically significant at 5% significance level, *** statistically significant at 1% significance level.
Source: own elaboration.

Completely different results, however, have been achieved when calculating the correlation between the CIT and the respective quota, as previously suggested by the input descriptive analysis. In this case, even a negative, however statistically insignificant, correlation has been demonstrated. Further investigation then focused on what correlation with the overall tax quota would have been reached if corporate quota had been used for the calculation of the WTI instead of the CIT sub-index. The correlation analysis was thus performed again using the recalculated WTI. The resulting correlation coefficient reached a value of 51.4 % in this case, at a significance level of 1 %.

Given this result, the WTI was similarly recalculated so as to remove another negative effect of low correlation in the case of the OTC. The CIT and OTC sub-indices were then substituted with the relevant tax quotas. The resulting correlation coefficient thus amounted to 50.8 % at a 1 % significance level.

4.3 The issue of corporate taxation

The previous sub-section describes the correlation between the tax quota as a whole or its sub-components for individual taxes and the relevant WTI or its sub-indices. As indicated, the situation appears to be most problematic in the area of corporate taxation, where even a negative, however statistically insignificant, correlation was found. One can thus assume that it is in the corporate tax burden that the tax quota as its approximator is very problematic. In principle, we can say that raising the effective tax burden is not reflected positively in the tax quota. For this reason, its use in growth theories is counterproductive. When looking for potential links between the level of the tax burden and the tax quota, several other models were used. In addition to linear, also exponential or parabolic. In terms of statistical verification, the use of a parabola appeared to be the most convenient, which had been previously implied by the aforementioned Laffer curve[33]. The highest coefficient of determination (see Table 5) thus presumes that, with a low tax burden, there is a positive link to the tax quota and with a higher tax burden (nominal corporate tax rate higher than 30 %) the dependence becomes negative.

Table 5. Laffer curve for corporate income tax.

	CIT quota		Corporate income tax revenue per cap.	
function	R^2 (%, combined tax rate)	R^2 (%, CIT)	R^2 (%, combined tax rate)	R^2 (%, CIT)
Linear	0.06	0.0008	3.8	1.2
quadratic	3.5	2.3	6.9	1.5

Source: own elaboration.

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[33] The correlation was performed for 2009 (last year with complete data) for all OECD members. The correlation with average values for the reference period (2005-2010) demonstrated similar findings.
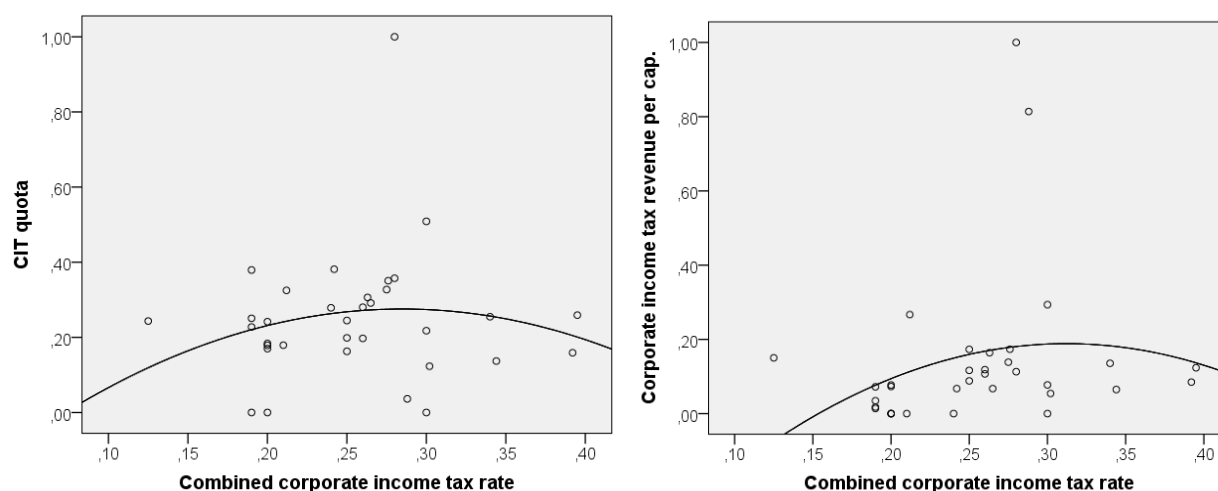
Fig. 1. Laffer curve for corporate income tax (Source: own elaboration).

When substituting the combined tax rate with the CIT, which is a WTI sub-index, similar conclusions were made. Therefore, there is no linear or directly proportional relationship between the effective tax burden (CIT) and the tax quota. This relationship is rather non-linear and with the nominal rate in excess of 30 % (or CIT greater than 0.2), the correlation between the effective rate and the quota is inverse (see Fig. 1). The tax quota is not a suitable approximator of the effective corporate tax burden. The above may be due to the fact that corporations react more sensitively to an increase in the tax burden than entities subject to personal income tax, and resort to tax optimization or tax evasion.

5.   The effect of taxation on economic growth: panel data estimation

5.1 Methodology and data

In the regression analysis performed, the extended neoclassical model was used in its basic form, as recommended by Mankiw, Romer and Weil (1992), or Barro (1996, 2001). The dependent variable was the real GDP per capita in USD converted by purchasing power parity (RGDP) and the independent variables were the standard growth variables, such as the level of real investment relative to real GDP (RINVESTMENT), the rate of population growth (POPULATION), and an approximation of the level of human capital[34] (HUMAN). In accordance with the hypothesis of conditional convergence in OECD countries,[35] the initial level of GDP in 1984 (GDP84) was also included as the independent variable. As in the study of Mankiw, Romer and Weil (1992), the rate of technological progress and depreciation of capital (in the summary as a 5% increase/year) was included as an exogenous variable.

The size of taxation is measured using a standard tax quota (TQ). The influence of individual taxes according to OECD classification OECD (2011) is also separately studied. They include, in particular, personal income taxes (classification 1100), corporate taxes (classification 1200), social insurance (Classification 2000), and also indirect taxes on consumption (VAT - classification 5110, and selective excise taxes - classification 5120). Finally, the influence of property taxes was studied (classification 4000).

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[34] Approximated using a share of the population with at least secondary education on the labour force (aged 15-64).
[35] Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

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A substantial part of this paper is focused on the inclusion of an alternative index of the tax burden of our own design (WTI), which is also decomposed into individual taxes, in accordance with the above OECD classification. The decomposition is performed separately for personal income tax, which also includes social security contributions (PIT), corporate income tax (CIT), value added tax (VAT), other taxes on consumption (OTC), and property taxes (PRO).

The integration of taxation into growth models is carried out according to the hypothesis of its influence on individual growth variables described in the previous chapter as an induced component (see part 1).

Most data on the level of taxation (tax quota and its sub-components) was taken from the OECD Factbook Statistics (OECD, 2012a). The WTI index and sub-indices were constructed based on the data from OECD Tax Database (OECD, 2012b) and OECD Tax Statistics (OECD, 2012c). Data on the GDP per capita and the investment to GDP ratio were obtained from the Penn World Table database (see Heston, Summers, Aten, 2006), designed on the basis of data from the system of national accounts of the economies from around the world, as described in the study by Heston et al. (Heston, Summers and Aten, 2006). As an additional source of data on the size of human capital, the OECD database (see OECD, 2012a) was used. The period analysed was 1995-2010, for which it was possible to guarantee a nearly complete and reliable time series (especially with regard to the post-socialist OECD members) and in particular the period 2005-2010, which was used to design the WTI index.

The method used was panel data estimation that uses significantly more degrees of freedom with individual assessment of potential impacts (i.e. existence of cross-country heterogeneity), as compared to cross-country analysis. Due to the relatively small number of countries and relatively short time series, a combination of time and cross-sectional data is necessary. This makes the presented statistics more reliable. The software used was E-Views, version (7), which allows making estimates on panel data.

The aim of these estimations was to verify a hypothesis about existence of the impact of taxation and particularly the individual taxes on long-term economic level and possibly also on economic growth. However, the main aim was to determine whether the tax quota can be used as a good approximator of the tax burden, and whether the use of an alternative tax burden index of our own design does not modify the conclusions about the impact of taxation on long-term living standard and growth.

In the panel data estimation, the amount of real GDP per capita was used as the dependent variable. Independent variables were the aforementioned growth variables and also the different tax quota and WTI index sub-components. In the first phase, the tests for stationarity were performed using the panel unit root test according to Levin, Lin, Chu (2002). Only WTI, VAT and OTC were found to be non-stationary variables. Their stochastic instability was eliminated in the subsequent analyses by using first differences- d(WTI), d(VAT), d(OTC), where the unit root tests rejected the non-stationarity. The test according to Levin, Lin, Chu (2002) proved stationarity of the RGDP; however, according to alternative tests by Im, Pesaran, Shin (2003), or Maddala, Wu (1999), this variable was verified as non-stationary. Therefore, RGDP's first differential - d(RGDP) - was used in subsequent analyses.[36]

The problem of autocorrelation and heteroscedasticity was eliminated by using a robust estimator which, when calculating the covariance matrices, ensures the correctness of the results of standard deviations of parameters and hypothesis tests with regard to autocorrelation and heteroscedasticity.[37]

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[36] Which allows us to study the impact of independent variables on the growth rate of GDP.

[37] A white period method provided by the econometric software E-Views, version (7).

The tests used a model with fixed effects, which is, according to Wooldridge (2009), more suitable in the case of macroeconomic data as well in a situation where the cross-sectional units are countries. This procedure also relied on the support of a Hausman test.[38]

5.2 The tax quota: panel data estimation, 1995-2010

The following Table 6 summarizes the estimation results for the period 1995-2010, where individual sub-components of the tax quota according to the OECD methodology were used to express the tax burden. This does not include variables that were excluded from the model due to its statistical insignificance during initial testing (GDP84, HUMAN, POPULATION). The statistically insignificant variables which were retained in the model include only variables indicating the level of the tax burden due to the fact that their exclusion did not lead to any substantial changes in estimates, and with regard to other analyses, they are presented for reference only.[39]

Table 6. The effect of tax quota components, 1995-2010.

Dependent variable	d(RGDP)
Number of observations	360
C	-0.02 (-1.68)*
1100+2000	-0.002(-1.61)*
1200	0.001(1.69)*
4000	-0.002(-1.64)*
5110	0.002(2.18)**
5120	0.001(0.38)
RINVESTMENT	0.002(3.52)***
@INGRP(G7)*1200	1.51E-06(1.69)*
Adj. R2	0.22
F-statistic	7.33***

Note: In parentheses are the t-statistics that are corrected for heteroscedasticity and autocorrelation; standard deviations are computed using robust estimations; *, **, *** indicate a significance level of 10 %, 5 %, 1 %, respectively, the method of fixed effects; "d" before a variable in the parentheses indicates the use of a difference.
Source: own elaboration.

The analyses performed show that with an acceptable coefficient of determination and a model with a 1% level of significance, a statistically significant negative impact of personal income tax, together with social contributions (classification 1100 +2000) and the negative impact of property taxes (classification 4000) was demonstrated in OECD countries in 1995-2010. The variable of other taxes on consumption (classification 5120) was not confirmed as statistically significant. Conversely, contrary to theoretical concepts, the negative effect of corporate taxation was not confirmed. At a 10% level of significance, the positive effect of corporate taxes on long-term economic growth was confirmed as statistically significant. The conclusions on the issue of corporate taxation are in line with earlier analyses found in Kotlán, Machová and Janíčková (2011), however on a different sample of OECD countries and in a different period. They can be therefore considered relatively stable and credible. Statistically significant positive influence of VAT (classification 5110) was proved as well, also contrary to theoretical concepts.

Further focus concerned the relation being studied in selected, more homogeneous groups of countries. In accordance with the hypothesis of convergence (see Barro and Sala-i-Martin, 2004),

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[38] Random effects were not to be used according to Hausman test; see Hausman (1978).
[39] This also applies to other tables with the results of individual tests.

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which recommends following the conclusions of growth theories, particularly in countries with similar institutional characteristics, production functions, etc., the EU15[40] and G7[41] groups were analysed in more detail. For both these groups of countries, the statistics showed essentially comparable results. Table 6 presents the effect of the membership in G7 group (the coefficients of which were verified at higher levels of significance) expressed as a product of dummy variable and corporate tax (@ INGRP(G7)*1200). The corporate taxation was studied mainly due to controversial results, which do not comply with the tax theory, which postulates the negative effects of corporate taxation on long-term economic growth. At a 5% significance level, the influence of membership in the G7 (and, as the case may be, also in the EU15) on the positive relationship between corporate tax and long-term economic growth was shown. Developed, homogeneous countries that are close to a steady state thus show the positive effects of corporate taxation more profoundly than in the OECD as a whole. The influence of VAT was not proved as significant in this case. Therefore it is not presented in the Table 6.

5.3 The tax quota: panel data estimation, 2005-2010

With regard to the length of the WTI time series (2005-2010) and the limit of its reverse construction, an analysis in a narrower period (2005-2010) was separately performed for panel data estimation, including the tax burden, which will form the basis for comparison described in the following text.

Table 7. The effect of tax quota components, 2005-2010.

Dependent variable	d(RGDP)
Number of observations	192
C	-0.05 (-2.25)**
1100+2000	-0.01(-1.92)**
1200	0.002(1.68)*
4000	-0.001(-1.01)
5110	0.003(1.65)*
5120	-0.001(-0.23)
RINVESTMENT	0.003(4.71)***
@INGRP(G7)*1200	4.11E-06(1.71)*
Adj. R2	0.19
F-statistic	6.02*

Note: In parentheses are the t-statistics that are corrected for heteroscedasticity and autocorrelation; standard deviations are computed using robust estimations; *, **, *** indicate a significance level of 10 %, 5 %, 1 %, respectively, the method of fixed effects; "d" before a variable in the parentheses indicates the use of a difference.
Source: own elaboration.

In this shorter period, using about half the observations, previous findings were essentially confirmed with lower coefficient of determination. Nevertheless, the models are not aspiring to include all the factors that the growth may be affected by. The aim is just to show the direction and significance of tax variables. That is why coefficients of determination of about 20 % are acceptable. The positive impact of corporate taxation and VAT, and the negative impact of other taxes were proved (see Table 7), except for the statistically-insignificant impact of other taxes on consumption and property taxes. The influence of the membership in the more homogeneous group of G7 countries is greater in the period.

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[40] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.
[41] Canada, France, Germany, Italy, Japan, United Kingdom, United States.

5.4 WTI: panel data estimation, 2005-2010

The aforementioned positive effect of corporate taxation (resp. VAT), which is inconsistent with the tax theory, can probably be attributed to using the tax quota indicator, which may not be at all reflective of effective taxation of corporations. The positive link between the tax burden and tax revenues represented by the tax quota is therefore most likely lost. The goal of the following analysis was to determine whether the use of the alternative tax burden index of WTI will alter the conclusions in the existing empirical analyses.

Table 8. The effect of WTI components, 2005-2010.

Dependent variable	d(RGDP)
Number of observations	204
C	-0.06(-2.82)***
PIT	-0.06(-1.72)*
CIT	-0.04(-1.69)*
PRO	-0.08(-1.75)*
d(VAT)	-0.18(-1.77)*
d(OTC)	0.68(0.45)
RINVESTMENT	0.004(7.03)***
@INGRP(G7)*CIT	-0.007(-1.88)*
Adj. R2	0.24
F-statistc	5.65***

Note: In parentheses are the t-statistics that are corrected for heteroscedasticity and autocorrelation; standard deviations are computed using robust estimations; *, **, *** indicate a significance level of 10 %, 5 %, 1 %, respectively, the method of fixed effects; "d" before a variable in the parentheses indicates the use of a difference.
Source: own elaboration.

As shown in Table 8, the negative impact of corporate taxation (resp. VAT) on long-term economic growth was proved at the 10% level of significance. This probably confirms the hypothesis that the tax quota is not a suitable approximator of the actual tax burden, particularly in the area of corporate taxation or taxation via VAT. Tax burden on corporations, consistently with the tax theory, negatively affects long-term economic growth, which is not so significant in the G7 countries.

Finally, we need to mention that analyses of the effect of the tax quota as a whole and the WTI as a whole were also carried out, but the findings were statistically insignificant, with a coefficient of determination of up to 5 %.

6. Conclusion

In an effort to approximate the tax burden for the purpose of comparison or its integration into macroeconomic models, the indicator of tax quota, i.e. the ratio of tax revenue to nominal GDP, is most frequently used. Although it is a relatively simple indicator in terms of its construction, and therefore also more readily available in a sufficiently long time series and for a large sample of countries, the use of this indicator implies a number of shortcomings that have been described above. The aim of this paper was therefore to evaluate the impact of taxation on long-term economic growth using alternative tax burden indicator - the World Tax Index (WTI), and to show whether the tax quota is a suitable approximator of tax burden.

The WTI is a multicriteria tax burden index, which combines both hard data from available databases as well as soft data from a questionnaire survey conducted among tax experts from all OECD countries. The WTI consists of five sub-indices, which reflect the tax burden with respect to

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corporate taxation, personal taxation, VAT, other taxes on consumption, and property taxes. In addition to the tax rates, the individual sub-indices also consider e.g. tax progression, administrative difficulty of taxation, tax deductible costs, tax incentives, etc.

The positions of each of the countries being studied with regard to the tax burden do not show significant differences when expressed as the WTI and tax quota, which was also confirmed by the correlation analysis. The corporate tax burden or taxation via VAT is the exception.[42] The Laffer curve designed e.g. for the corporate tax quota furthermore indicates that this is not a suitable approximator of the corporate tax burden. A subsequent regression analysis then showed that, when expressing the tax burden through the tax quota, the negative effect of corporate taxation on long-term economic growth, as suggested by economic theory, cannot be confirmed. On the other hand, if the tax burden is approximated through the WTI and its components, the statistically-significant negative effect of corporate taxation on economic growth is clearly provable, as well as the negative effect of all other types of taxes being studied (with exception of statistically insignificant OTC).

We can conclude by saying that WTI is a good indicator for the approximation of the tax burden, and as such it is applicable not only for comparing the tax burden for individual countries, but also as an indicator of the tax burden in macroeconomic models, particularly in models of long-term economic growth. Using the WTI can also modify the conclusions not only in growth models, but also in other econometric models, which examine the impact of institutional or economic variables on key variables such as level of corruption (Kotlánová and Kotlán, 2012), the degree of financial integration (Kučerová, 2009), or institutional aspects of the functioning of the labor market (Tvrdoň, 2008). Tax quota, especially in measuring the tax burden on corporations, or VAT burden, apparently fails.

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[42] For more on corporate taxation in relation to economic growth, see Kotlán and Machová (2012b).

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TRANSATLANTIC FREE TRADE AGREEMENT IN GOODS

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Abstract. The idea of creating a free trade area between the European Union and the United States to liberalize trade is not new. Trade and investment between the EU and US are significant and presented the largest bilateral economic relationship in the world. From a strict merchandise trade volume perspective, China is now competing with the two at the top. But in bilateral economic relations, trade is only one of the factors behind the extent of cross-border integration. Creating a free trade area in goods between big economies has bigger effects than between smaller economies. Most of the free trade agreements signed in the past are between two smaller economies, or between a big economy and a small economy. The aim of this paper is to define possible impacts of creating the transatlantic free trade agreement in goods between the EU and US.

Keywords: free trade area, liberalization, merchandise trade, integration.

JEL Classification: F15, 051, 052.

1. Introduction

When two of the biggest economies in the world, representing more than 40 % of global GDP and with 600 billion USD in total bilateral trade, eliminate tariffs in their bilateral trade, it will have a clear effect on competition. Had they also reduced non-tariff measures ambitiously, the effect would be far higher.

Discussion about closer cooperation based on creating a free trade area between the EU and US began in 90 years. This project was named TAFTA – Transatlantic Free Trade Agreement. But this effort has not been implemented because the timing and arguments were not sufficient. As the first argument of this failure can be identified the fact, that 90 years was the period associated with a dispute in which US intervened. As an example can be included two Iraq wars and the NATO intervention in Kosovo. Second, there has been a lack of solid economic arguments in the debate over initiatives. Many studies analyzing the costs and benefits of various free trade initiatives have been elaborated but never of them have been completed. The next argument was the critic of TAFTA from the World Trade Organization (WTO) based on idea, that such initiative would kill an ongoing round of negotiations, since there has been a round ongoing or in preparation in the past 30 years. An example of this is the Doha round which was launched in 2001 and till now has not been completed. And last but not least, there have not been many strong friends of this form of cooperation between these partners. The aim of this paper is to define possible impacts of creating the transatlantic free trade agreement in goods between the EU and US.

2. Theory of the free trade area

Theory of the international economic integration mostly begins with a theory of the customs union, while the customs union is widely regarded as the second degree of the international economic integration. The theory of the first degree of the international economic integration – a free trade area (FTA) – can be found for example in the studies by Shibata (1998), Palmeter (1998), El-Agraa (1999), Mirus and Rylská (2003), Grinols and Silva (2003) who developed a modern theory of a free trade area.

2.1 Definition of the free trade area

Free trade area represents the lowest and the least developed degree of international economic integration (in practice often limited only to trade in industrial commodities). This form of the

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economic integration is preferred, especially by countries that are unwilling or unable to engage in higher level of economic integration (for example customs union, common market etc.).

Varadzin (1997) characterizes the FTA as the lowest degree of macro-integration[43], in which barriers to the free movement of goods were removed by the member countries. This includes a removal of both tariff and non-tariff barriers, including quantitative quotas and administrative restrictions (regulations, standards etc). In the free trade area, each country retains its own external trade policy towards non-member countries.

Shibata (1998) states as examples of the free trade area a definition from Article 4 of the Stockholm Treaty (1960), which established the European Free Trade Association (EFTA), and a definition from Article 3 of the Montevideo Treaty (1960), which established the Latin American Free Trade Association (LAFTA). Article 4 states that the goods is considered eligible for the tariff treatment of a free trade area if it was sent to the importing member states from another member states and if the following conditions are satisfied in the area of origin: a) the goods was wholly produced in the FTA, b) it was designated in accordance with the terms and conditions set out in Article 9 of the General Agreement on Tariffs and Trade (GATT, 1986). Article 2 of the Montevideo Treaty states that during the defined period, the parties have to eliminate customs duties, fees and other restrictions applied to imports of goods originating in the territory of the contracting parties.

WTO[44] defines the free trade area as a group of two or more customs territories in which customs duties and other restrictive measures on all trade between the territories of those products which have their origin in these areas are removed. Such regional agreements have to facilitate mutual trade within FTA and not create barriers to trade between these countries and the rest of the world (third countries). Therefore, they should not to be a tool for discrimination against third countries.

As the basic characteristic of the FTA can be considered (Zlý, 2006):
- removal of tariff and non-tariff trade barriers, especially quantitative restrictions that impede the free movement of goods between two or more countries concerned,
- maintaining the national customs territory of the members,
- maintaining autonomous tariff and trade policies toward third (non-members) countries,
- necessity to prove the origin of goods, whose movement of the market is fully liberalized.

2.2 Trade creation and trade diversion effect

Using the following example inspired by Shibata (1998), two effects connected with creating a free trade area will be explained. Namely, trade diversion and trade creation will be discussed. As the initial assumptions, consider two open economies (the European Union – EU and the United States – US) producing completely identical product. The starting situation is shown in Fig. 1.

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[43] Varadzin (1997) distinguishes between micro-integration and macro-integration. Micro-integration means that the integration processes are a matter of particular subjects. Macro-integration then expresses a process that relates to the economy as a whole.
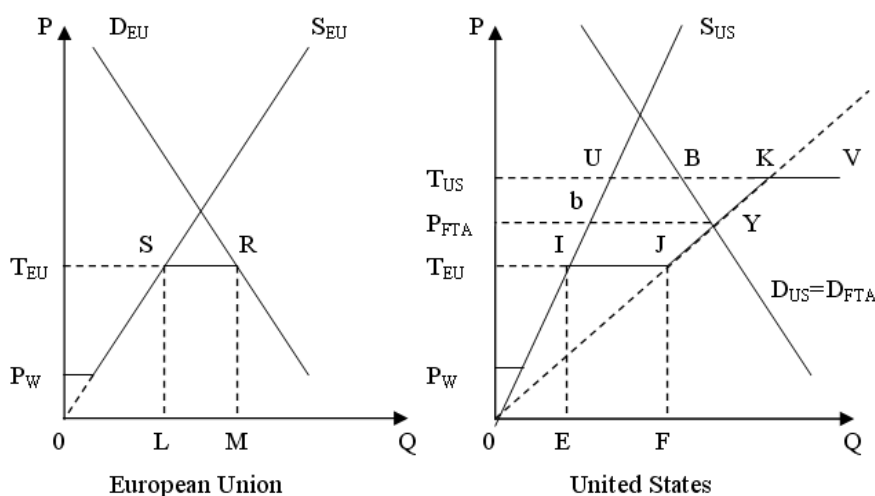[44] Same as above.

Fig. 1. Trade creation and trade diversion effect in the free trade area (Source: self-elaboration by Shibata, 1998).

These model economies have different amounts of duties. The EU has lower duties T_{EU} and the US has higher duties T_{US}. The price of the EU's products (assuming the adoption of zero transaction costs and perfect competition) equals the sum of the world price P_W and duty T_{EU} ($P_W + T_{EU}$). Analogously, the price of the US's products equals the sum of the world price P_W and duty T_{US} ($P_W + T_{US}$). Before creating the FTA the price of the EU's products is lower than the US. After creating the FTA three possibilities to state the price P_{FTA} exist. It will be on the level of the EU's or US's price or between them. Now let´s assume that the P_{FTA} is between the EU's or US's price stated. Total supply of the FTA (T_{EU}IJKV) consists of the EU and US supply and it is not perfectly elastic. Total demand of the FTA ($D_{US}=D_{FTA}$) consists of the US demand and it is not perfectly elastic too.

After creating the FTA, the quantity of goods which was initially imported from third countries, is completely replaced by imports from the EU (line segment bY). The gross effect of trade creation is the line segment T_{EU}S respectively IJ (in the figure of the United States).The gross effect of trade diversion is the line segment UB. The net effect depends on whether UB (trade diversion) is longer than IJ (trade creation).

3. Reasons for creating a free trade area between the EU and US

It can be distinguished at least three aspects that are important to creating the first degree of economic integration between the European Union (EU) and Unites States (US). The first reason is *size*. A free trade area between big economies has mostly bigger effects that between smaller economies. There were signed in the past mostly free trade areas between two smaller economies, or between a big economy and a small economy. The gains for a big economy in the latter form of agreements are typically small. For example, an estimate of the gross domestic product (GDP) effects on the EU from the EU-Korea Free Trade Agreement put the result at 0.08 % (Decreux, Milner and Péridy, 2010). Another example is the US full tariff elimination in the trade with Korea which put the GDP effect on the US in the value of 0.1 % (United States International Trade Commission, 2007). The size of the effect of an agreement is to a large extent a reflection of the size of the partnering economy.

The EU and the US present the biggest importer and exporter of goods in the world economy. The share of EU exports on world exports is steadily between the 15 – 20 %. The same indicator for the US is between 10 – 20 %. For example the share of both economies on world exports was 27.4 % in 2010. Fig. 2 presents the EU and the US export share on world exports.

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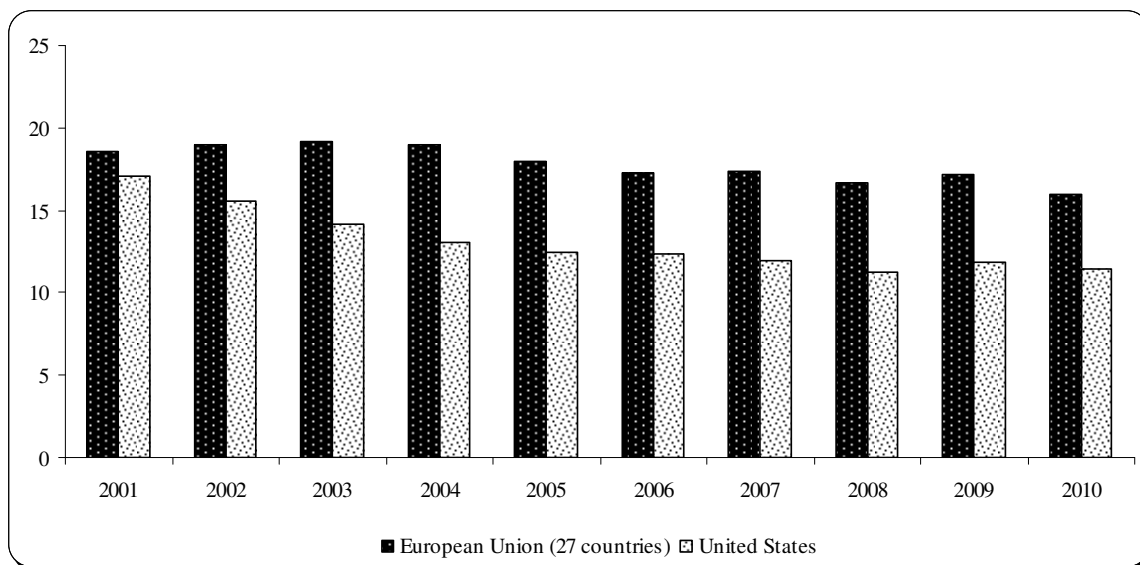
Fig. 2. The EU and the US export share on world exports (%) (Source: Eurostat, 2012).

Analogy can be analyzed the EU and the US import share on world imports (Fig. 3). The EU import share on world imports is between 15 – 20 % and the US import share is between 15 – 26 %. The share of both economies was 34.2 % in 2010.
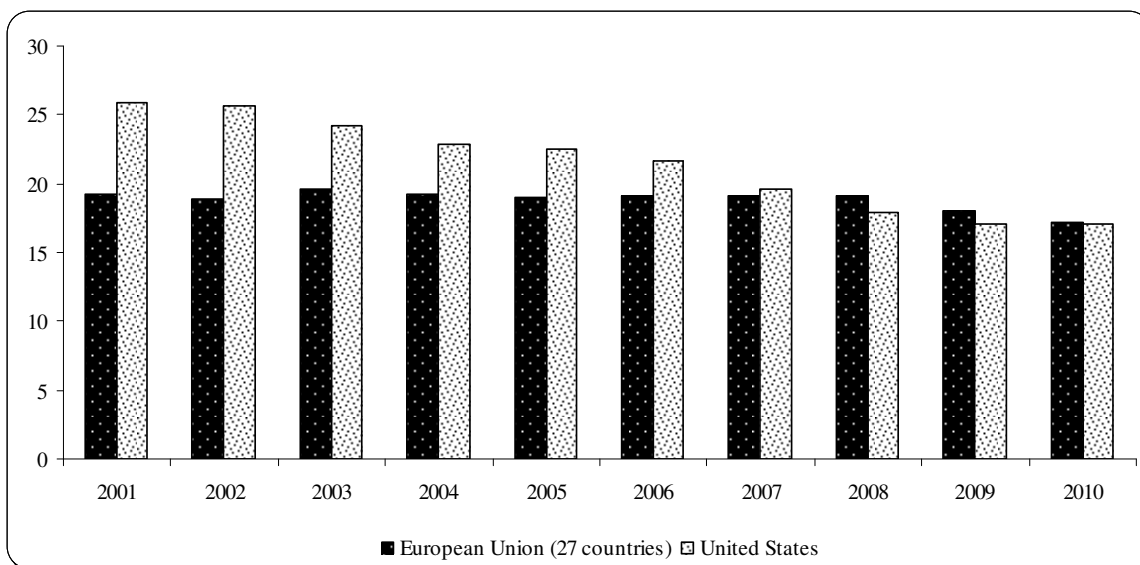
Fig. 3. The EU and the US import share on world imports (%) (Source: Eurostat, 2012).

It can be observed, that the EU has bigger share on the world exports than the US and the US has bigger share on the world imports than the EU. And the common share of both economies on the world imports is bigger than the common share of both on the world exports.

The EU has long-term surplus in trade in goods with the US (Table 1). In the years 2005 – 2011 was the surplus the biggest in 2006, when the value was 93.6 billion euro. It can be observed decline of the surplus due to the recent global financial and economic crisis. Since 2010, the surplus grows again.

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Table 1. EU's trade in goods with the US (billion euro).

flow/year	2005	2006	2007	2008	2009	2010	2011	I.12	II.12
export	252.7	269.1	259.2	247.6	203.4	242.3	260.7	22.2	23.7
import	163.5	175.5	174.1	179.5	151.9	170.4	184.3	17.1	16.8
balance	89.2	93.6	85.1	68.1	51.5	71.9	76.4	5.1	6.9

Source: Eurostat, 2012.

The biggest export share from the EU countries on the total exports of goods to the US in January 2012 had *Germany* in the value 31 % (Fig. 4). High share had also United Kingdom (15 %), France (10 %), Belgium (8 %), Italy and Netherlands (both 7 %). Germany, United Kingdom and France represented more than 55 % total export of the EU to the US. In the Annex 1 are presented export shares of all EU countries on total EU exports to the US in 2005 – 2010 (and in January and February 2012).
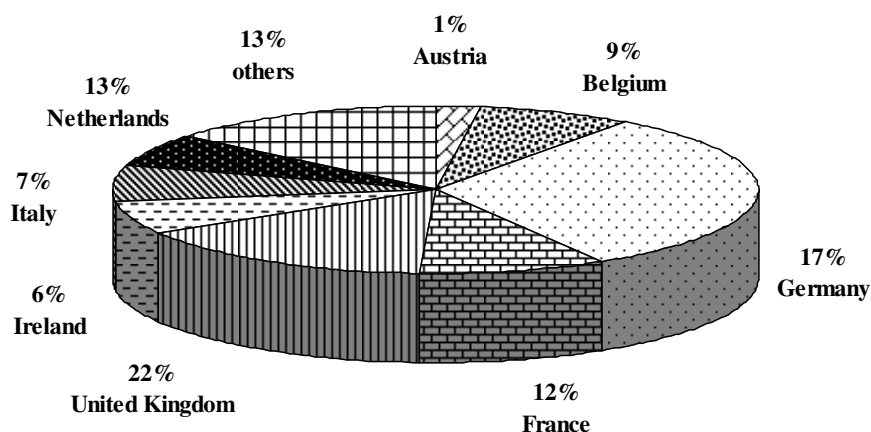
Fig. 4. Export shares of selected EU countries on total EU exports to the US in January 2012 (Source: self-elaboration by Eurostat, 2012).

The biggest import share from the EU countries on the total imports of goods from the US in January 2012 had *United Kingdom* in the value 22 % (Fig. 5). On the second place was Germany with value 17 %. The share between 12 – 13 % had Netherlands and France. United Kingdom, Germany, Netherlands and France created more than 64 % total imports of the EU from the US. In the Annex 2 are presented import shares of all EU countries on total EU imports from the US in 2005 – 2010 (and in January and February 2012).
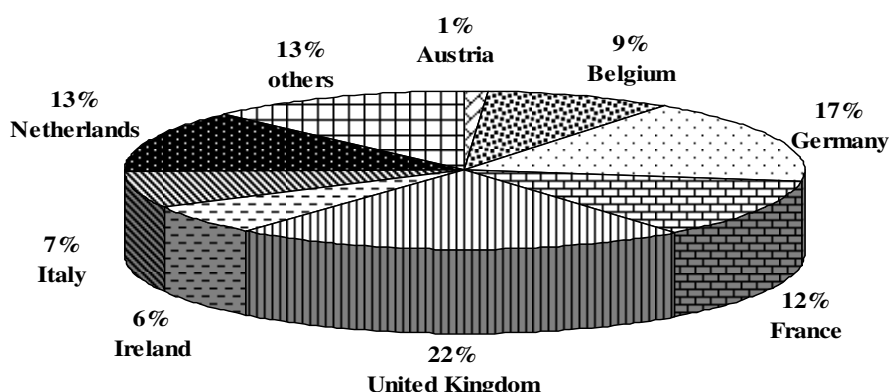
Fig. 5. Import shares of selected EU countries on total EU imports to the US in January 2012 (Source: self-elaboration by Eurostat, 2012).

The second reason is *the high degree of intra-firm trade driven by foreign affiliates*. Why is a high degree of foreign affiliates an important factor for trade? Erixon and Bauer (2010) states, that there is a high degree of intra-firm trade between foreign affiliates, and even if tariffs are low they represent an international "tax" on what would otherwise be a normal intra-firm transfer and require administrative costs to manage. We know from several studies that such administrative trade costs can be significant – representing up to four or five percent of the value of trade, if not more. Half of all US foreign affiliates are in Europe and 60 % of the assets held by US foreign affiliates are in Europe. Estimates have suggested intra-firm trade to represent a third of total transatlantic trade.

Annex 3 contains number of enterprises, number of persons employed and turnover in million Euros of foreign affiliates in the US owned by EU enterprises in 2009. United Kingdom (from the EU countries) had the most affiliates in the US in 2009 (4 210), which employed 1 352 129 persons and had total turnover in value 323 818 million Euros. The Czech Republic had 8 affiliates in the US in 2009, which employed 73 persons and had total turnover in value 32 million Euros. The most US affiliates was in 2009 in United Kingdom (5 743), which employed 1 031 034 persons and had turnover in value 55 235 Euros per enterprise. The second biggest US affiliates country was Germany with 3318 affiliates which employed 478 284 persons and had turnover in value 56 209 Euros per enterprise. Interestingly, Czech Republic had 1149 US affiliates in 2009 which employed 111 234 persons and the turnover was 15 686 Euros per enterprise.

The third reason is *intra-industry trade (IIT)* – that is inward and outward trade in the same sector (Erixon and Brandt, 2011). A high degree of IIT suggests that the competition effect of an elimination of tariffs can be significant. As there is competition between firms in those sectors, the dynamic effect could be considerable once tariffs are eliminated. A higher degree of competition is one of the key dynamic effects from trade liberalization: liberalization forces firms to behave more productively. Sectors with a high degree of IIT get another competition boost – and it is such effects that leave a clear imprint on the larger economy.

4. Free trade area between the EU and US

Erixon and Bauer (2010) estimated the gains from transatlantic free trade agreement in goods by the general equilibrium model in the time period 2010 - 2015. They distinguished between two effects of a full elimination of tariffs on goods traded between the EU-25 and the US. The first are static effects which usually resulting from an improvement of allocative efficiency. The second are dynamic gains

which generally linked to expanded capital accumulation, expansions of investment and productivity effects. Specification of scenarios using in this study are presented in Table 2.

Table 2. Specification of scenarios.

Scenario 1 (static effects)	Full elimination of tariff on goods
Scenario 2 (dynamic effects)	Full elimination of tariff on goods
	Reduction of trade facilitation costs by an amount equivalent to 3 % of the value of trade in non-commodity goods sectors
	Increase in labor productivity by 2 % in goods sectors
Scenario 3 (dynamic effects)	Full elimination of tariff on goods
	Reduction of trade facilitation costs by an amount equivalent to 3 % of the value of trade in non-commodity goods sectors
	Increase in labor productivity by 3.5 % in sectors with high levels of intra-industry trade, increase in labor productivity by 2 % in all other goods sectors

Source: self-elaboration by Erixon and Bauer (2010).

The presentations of the results will also follow the three scenarios, allowing for comparisons between the results of different scenarios. It is worth adding the reminder that the model and the scenarios are based on assumptions. The results are simulations, not determinations of what the result should be. Effects on gross domestic product (GDP) for above mentioned scenarios are presented in Table 3.

Table 3. Estimated GDP gains.

	Scenario 1		Scenario 2		Scenario 3	
	%	mill. USD	%	mill. USD	%	mill. USD
EU-25	0.01	1 644	0.32	46 450	0.47	69 287
USA	0.15	20 470	0.99	135 236	1.33	181 893

Source: self-elaboration by Erixon and Bauer (2010).

Scenario 1, assuming full elimination of tariff on goods, should bring increase GDP of the EU-25 in 0.01 % (1 644 million USD). The same scenario for the US is connected with 0.15 % growth of US gross domestic product. The scenario 2 and 3 are very similar, but the scenario 3 also includes increase in labor productivity by 3.5 % in sectors with high level of intra-industry trade as an assumption. By the second and third scenario will EU-25 increase its GDP in value about 46 450 – 69 287 million USD, that is GDP in 2015 would be 0.32 – 0.47 % higher than it would be without elimination of tariffs. Similarly, the US will increase its GDP in value about 135 236 – 181 893 million USD, or 0.99 – 1.33 % in the same scenarios.

Besides the impact on GDP study also includes the impact on individual sectors of the EU and US economy. With using the above mentioned scenarios will total sectoral output rise to up to 140 billion USD in the EU and 93 billion USD in the US. The effect on total sectoral output should be significantly higher if non-tariff barriers are removed progressively. In the Annex 6 and 7 are presented estimated EU and US sectoral output by individual branches. The estimated welfare gains – measured as national income effects – are more evenly distributed between the two economies. The static effect of tariff elimination is 3bn USD for the EU-25 and 4.5bn USD for the United States. The dynamic welfare gains are estimated to be 58-86bn USD for the EU-25 and 59-82bn USD for the US.

The estimated change in EU-25 exports to the US is 7 % (or 28bn USD) in a static scenario and around 18 % (or 69bn USD) in the dynamic scenario. The US is estimated to increase its exports to the UE-25 by 8 % (or 23bn USD) in the static scenario and 17 % (or 53bn USD) in the dynamic scenario. (Erixon and Brandt, 2011)

5. Conclusion

In this paper are presented three aspects that are important to creating a closer economic integration based on the first degree of international economic integration – a free trade area – between the European Union and United States. Subsequently, the benefits from the creating of the free trade area between these economies are evaluated.

The first argument is size. A free trade area between big economies has mostly bigger effects that between smaller economies. The European Union and the United States are the biggest importer and exporter of goods in the world economy. The share of EU exports on world exports is between the 15 – 20 %, the share of US exports on world exports is between 10 – 20 %. The share of these economies on the world imports is greater then export. The EU import share on world imports is between 15 – 20 % and the US import share is between 15 – 26 %. Both economies are also the largest trading partners of each other. The second argument is the high degree of intra-firm trade driven by foreign affiliates. Only in 2009 had the member states of the EU almost 15 106 foreign affiliates in the United States which employed more than 3 millions persons and the turnover was about 876 241 millions euros. More then half of all these affiliates is owned United Kingdom (4 210), Germany (3 474) and France (2 626). The US enterprises had 24 854 foreign affiliates in the EU countries in the same year. The most US affiliates was in United Kingdom (5 743), Germany (3 318), France (2 907), Italy (2 225) and Hungary (2 129). The third argument is intra-industry trade.

The benefits of creating the free trade area in goods between the EU and US are from Erixon and Bauer study presented. The full elimination of tariff on goods should bring increase GDP of the EU-25 in 0.01 % in value 1 644 million USD and increase GDP of US in 0.15 %. This was the characteristic of the first scenario. The second and third scenarios include apart from the full elimination of tariff on goods also the reduction of trade facilitation costs by an amount equivalent to 3 % of the value of trade in non-commodity goods sector and increase in labor productivity by 2 % in goods sector. And in scenario 3 is the increase in labor productivity by 3.5 % in sectors with high level of intra-industry trade. The benefits from the second and third scenarios are the increase GDP of the EU-25 in value about 46 450 – 69 287 million USD and the US will increase its GDP in value about 135 236 – 181 893 million USD. Besides the impact on GDP study also includes the impact on individual sectors of the EU and US economy. With using the above mentioned scenarios will total sectoral output rise to up to 140 billion USD in the EU and 93 billion USD in the US. The effect on total sectoral output should be significantly higher if non-tariff barriers are removed progressively.

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Annex 1. The EU countries share on the EU exports of goods to the US.

state/year	2005	2006	2007	2008	2009	2010	2011	I.12	II.12
Austria	2.32	2.35	2.26	2.14	1.94	2.03	2.36	2.31	2.43
Belgium	6.82	6.74	7.02	6.34	7.07	7.32	6.68	7.57	8.21
Bulgaria	0.11	0.13	0.12	0.10	0.09	0.09	0.10	0.07	0.09
Cyprus	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00
Czech Republic	0.66	0.65	0.67	0.71	0.64	0.72	0.87	0.98	0.98
Denmark	1.74	1.70	1.77	1.72	2.02	1.87	1.85	1.82	2.12
Estonia	0.08	0.19	0.13	0.16	0.13	0.14	0.29	0.27	0.34
Finland	1.23	1.49	1.62	1.68	1.73	1.52	1.12	1.65	1.38
France	10.50	9.66	9.60	9.67	9.66	9.25	9.03	9.52	9.68
Germany	27.22	28.29	28.16	28.71	26.63	26.79	28.00	31.50	28.87
Greece	0.29	0.27	0.27	0.36	0.35	0.27	0.47	0.29	0.47
Hungary	0.60	0.61	0.63	0.68	0.67	0.63	0.66	0.62	0.66
Ireland	6.45	6.03	6.10	6.56	8.59	8.47	8.17	6.45	5.74
Italy	9.48	9.12	9.36	9.30	8.41	8.39	8.77	6.76	8.34
Latvia	0.04	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.03
Lithuania	0.18	0.18	0.12	0.21	0.17	0.18	0.20	0.12	0.06
Luxembourg	0.12	0.14	0.12	0.12	0.15	0.11	0.15	0.09	0.12
Malta	0.10	0.10	0.09	0.07	0.07	0.08	0.06	0.05	0.05
Netherlands	5.50	6.12	6.73	6.76	6.93	7.02	6.55	6.56	6.60
Poland	0.59	0.63	0.58	0.68	0.87	0.91	1.02	0.93	0.81
Portugal	0.65	0.78	0.69	0.54	0.50	0.55	0.57	0.85	0.84
Romania	0.34	0.24	0.23	0.23	0.17	0.23	0.31	0.20	0.31
Slovakia	0.32	0.40	0.41	0.33	0.21	0.30	0.34	0.22	0.41
Slovenia	0.12	0.15	0.13	0.11	0.11	0.12	0.13	0.12	0.11
Spain	2.51	2.78	2.85	3.02	2.78	2.69	3.03	2.74	2.87
Sweden	4.38	4.05	3.61	3.31	2.95	3.62	3.27	2.76	3.04
United Kingdom	17.61	17.18	16.69	16.43	17.10	16.66	15.95	15.53	15.41

Source: self-elaboration by Eurostat (2012).

Annex 2. The EU countries share on the EU imports of goods to the US.

state/year	2005	2006	2007	2008	2009	2010	2011	I. 12	II.12
Austria	1.40	1.40	1.52	1.25	1.08	1.22	1.33	1.14	0.98
Belgium	8.38	8.73	9.58	9.80	9.65	9.97	10.08	8.79	10.23
Bulgaria	0.22	0.21	0.14	0.15	0.09	0.08	0.11	0.07	0.10
Cyprus	0.05	0.05	0.04	0.07	0.06	0.05	0.04	0.04	0.03
Czech Republic	0.56	0.58	0.64	0.65	0.56	0.75	0.75	0.68	0.61
Denmark	1.01	1.13	1.32	1.27	1.27	1.13	1.03	1.63	1.27
Estonia	0.08	0.07	0.08	0.06	0.06	0.05	0.07	0.07	0.05
Finland	0.80	0.79	0.77	0.70	0.62	0.64	0.84	0.65	0.58
France	12.52	11.24	11.47	11.48	12.58	12.16	11.96	12.09	11.89
Germany	19.56	19.23	19.97	19.14	18.51	19.13	19.38	17.33	19.02
Greece	0.92	0.51	0.72	0.92	0.94	0.69	0.45	0.23	0.26
Hungary	0.54	0.50	0.55	0.58	0.58	0.60	0.71	0.73	0.67
Ireland	4.65	3.82	3.94	3.67	5.01	3.72	3.40	6.12	2.36
Italy	6.56	6.10	6.26	6.51	6.23	6.54	7.07	7.30	6.78
Latvia	0.05	0.05	0.07	0.06	0.04	0.03	0.04	0.06	0.03
Lithuania	0.15	0.14	0.23	0.21	0.10	0.11	0.14	0.11	0.11
Luxembourg	0.34	0.34	0.42	0.29	0.26	0.39	0.59	0.24	0.31
Malta	0.10	0.10	0.11	0.04	0.05	0.05	0.09	0.06	0.05
Netherlands	13.57	14.74	15.09	16.42	16.27	15.93	14.28	12.80	14.06
Poland	0.60	0.75	0.89	1.13	1.00	1.31	1.20	1.23	1.02
Portugal	0.65	0.44	0.55	0.57	0.57	0.50	0.60	0.35	0.38
Romania	0.55	0.56	0.40	0.46	0.34	0.31	0.34	0.25	0.32
Slovakia	0.13	0.13	0.13	0.18	0.15	0.13	0.15	0.16	0.12
Slovenia	0.09	0.11	0.16	0.24	0.22	0.17	0.28	0.57	0.14
Spain	3.75	4.02	4.80	5.33	4.40	4.68	4.85	3.41	4.53
Sweden	1.97	2.01	2.00	2.01	2.15	2.11	2.07	2.05	1.90
United Kingdom	20.81	22.24	18.13	16.81	17.22	17.57	18.15	21.86	22.20

Source: self-elaboration by Eurostat (2012).

Annex 3. Foreign affiliates of EU enterprises in US in 2009.

state/indicator	Number of enterprises	Number of persons employed	Turnover - Million EUR
Austria	145	12 983	4 380
Belgium	161	53 923	16 967
Bulgaria	7	5	1
Cyprus	5	:	:
Czech Republic	8	73	32
Denmark	483	38 388	:
Estonia	6	:	:
Finland	180	28 674	10 243
France	2 626	477 526	134 059
Germany	3 474	602 270	258 595
Greece	8	442	444
Hungary	3	7	66
Ireland	:	:	:
Italy	1 852	152 877	30 656
Latvia	1	1	:
Lithuania	1	:	:
Luxembourg	19	3115	:
Malta	0	0	0
Netherlands	1 395	234 207	74 828
Poland	29	5 572	240
Portugal	31	1 000	405
Romania	1	1	0
Slovakia	:	:	:
Slovenia	:	:	:
Spain	461	66 184	21 507
Sweden	:	:	:
United Kingdom	4 210	1 352 129	323 818
EU-27	*15 106*	*3 029 377*	*876 241*

Source: self-elaboration by Eurostat (2012).

Annex 4. Foreign affiliates based in the EU countries owned by US enterprises in 2009.

state/indicator	Number of enterprises	Number of persons employed	Turnover per enterprise
Austria	452	44 125	37 970,4
Belgium	:	:	:
Bulgaria	530	17 111	3 040,0
Cyprus	12	645	22 669,5
Czech Republic	1 149	111 234	15 685,8
Denmark	397	31 779	28 201,3
Estonia	40	5 184	9 787,6
Finland	432	28 690	20 145,1
France	2 907	404 055	56 272,5
Germany	3 318	478 284	56 209,2
Greece	:	:	:
Hungary	2 129	75 727	8 490,1
Ireland	:	:	:
Italy	2 225	266 804	42 716,3
Latvia	264	4 932	2 450,9
Lithuania	:	:	:
Luxembourg	132	11 745	84 254,0
Malta	:	:	:
Netherlands	1 216	170 232	105 215,0
Poland	355	90 429	40 345,8
Portugal	321	24 669	20 040,8
Romania	887	57 270	5 471,8
Slovakia	86	22 193	34 933,1
Slovenia	73	4 218	14 296,1
Spain	993	146 285	41 535,5
Sweden	1 193	105 068	24 968,6
United Kingdom	5 743	1 031 034	55 235,3
EU-27	*24 854*	*3 131 713*	*729 934,7*

Source: self-elaboration by Eurostat (2012).

Annex 5. Estimated EU sectoral output.

	Scenario 1		Scenario 2		Scenario 3	
	in %	in mil $	in %	in mil $	in %	in mil $
Grains	-1.26	-636	-1.15	-577	-1.11	-559
Horticulture	-0.35	-778	-0.12	-261	-0.15	-336
Oil Seeds	0.13	20	-0.07	-11	-0.11	-16
Sugar	0.06	6	0.52	48	0.73	67
Natural Fibres	0.18	17	0.8	75	0.85	79
Dairy Products	-0.26	-174	0.22	146	0.38	254
Livestock and Meat Products	-0.11	-311	0.36	984	0.41	1 133
Fishing	-0.05	-16	0.1	33	0.15	50
Forestry	-0.05	-21	0.3	125	0.3	126
Mining and Extraction	-0.03	-32	0.01	14	-0.03	-40
Oil and Gas	0	-2	-0.05	-36	-0.07	-51
Processed Food	0.07	945	0.56	7 538	0.77	10 444
Textiles and Clothing	0.49	2 474	0.75	3 772	0.99	5 002
Wood Product	-0.03	-74	0.53	1 249	0.47	1 104
Light Manufacturing	0.29	1 325	0.78	3 551	1.06	4 810
Paper and Publishing	-0.03	-193	0.29	1 889	0.55	3 605
Petrochemicals	0.23	942	0.63	2 577	0.75	3 067
Chemicals, Rubber, Plastics	-0.04	-625	0.22	3 398	0.48	7 403
Mineral Products	0.34	1 240	0.86	3 099	1.15	4 141
Iron and Steel	-0.03	-363	0.42	4 614	0.81	8 995
Motor Vehicles	0.11	1 210	0.98	10 800	1.35	14 951
Electrical Machinery	-0.28	-1 401	-0.6	-2 998	-0.34	-1 713
Other Machinery	-0.03	-498	0.44	6 508	0.84	12 364
Transport Equipment	-0.66	-1 537	-0.99	-2 314	-0.66	-1 549
Utilities	0	-11	0.25	1 163	0.41	1 916
Construction	0.05	872	0.63	10 304	0.95	15 575
Trade	0.02	639	0.32	9 782	0.51	15 667
Transport	0.02	338	0.1	1 491	0.14	2 140
Communication	-0.02	-75	0.14	694	0.25	1 213
Insurance	-0.02	-81	0.07	238	0.13	452
Other Business Services	-0.01	-398	0.19	7 707	0.33	12 995
Other Services	-0.01	-343	0.2	10 649	0.31	16 541
SUM		*2 457*		*86 252*		*139 830*

Source: Erixon and Bauer (2010, p. 14).

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Annex 6. Estimated US sectoral output.

	Scenario 1		Scenario 2		Scenario 3	
	in %	in mil $	in %	in mil $	in %	in mil $
Grains	0.34	165	0.02	8	-0.24	-121
Horticulture	0.69	664	0.59	576	0.47	452
Oil Seeds	-0.56	-141	-0.5	-125	-0.73	-182
Sugar	0.07	2	0.38	10	0.39	11
Natural Fibres	-0.64	-122	-0.73	-140	-0.81	-154
Dairy Products	0.31	110	0.57	204	0.56	201
Livestock and Meat Products	0.03	70	0.37	1 012	0.31	837
Fishing	0.15	11	0.22	17	0.19	15
Forestry	-0.05	-12	0.05	11	-0.02	-5
Mining and Extraction	-0.06	-58	-0.01	-9	0.01	6
Oil and Gas	-0.05	-72	-0.13	-183	-0.18	-263
Processed Food	0.08	480	0.39	2 345	0.4	2 429
Textiles and Clothing	-0.36	-769	-0.26	-571	0.35	747
Wood Product	-0.08	-225	0.37	1 063	0.37	1 042
Light Manufacturing	-0.27	-263	0.58	573	1.33	1 308
Paper and Publishing	-0.12	-527	0.13	592	0.4	1 805
Petrochemicals	0	-6	0.15	617	0.25	1 010
Chemicals, Rubber, Plastics	0.19	1 655	0.34	2 982	0.52	4 491
Mineral Products	-0.46	-655	-0.31	-440	0.02	25
Iron and Steel	-0.12	-753	-0.13	-817	0.27	1 713
Motor Vehicles	0.36	2 022	0.36	2 036	0.69	3 869
Electrical Machinery	-0.49	-2 245	-1.12	-5 152	-1.57	-7 198
Other Machinery	-0.09	-907	0.3	2 972	0.85	8 501
Transport Equipment	0.48	1 164	2.45	5 928	3.16	7 630
Utilities	0	-23	0.23	1 350	0.37	2 165
Construction	0.13	2 244	0.9	16 127	1.24	22 080
Trade	0.01	176	0.3	8 366	0.44	12 541
Transport	-0.03	-286	-0.02	-234	0.01	63
Communication	-0.02	-95	0.16	793	0.26	1 272
Insurance	-0.05	-246	-0.02	-119	0	18
Other Business Services	-0.04	-765	0.04	801	0.1	2 131
Other Services	-0.01	-938	0.2	16 525	0.29	24 605
SUM		*-346*		*57 117*		*93 046*

Source: Erixon and Bauer (2010, p. 14).

FINANCIAL AND TRADE INTEGRATION IN THE EU COUNTRIES

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Abstract. Using a data sample of the EU member countries over the period 1993-2010 we analyse the relationship between financial and trade integration. We use quantity-based measures of financial integration derived from the countries' international investment positions with a view to the foreign trade. We conclude that the progress in financial integration was smaller in the EU10 countries compared to the EU16 countries, i.e. the pace of financial integration was higher in the EU16 countries than in the EU10 countries. The process of trade integration in all EU countries was not as fast as the process of financial integration. Financial and trade integration are interconnected processes and should not be assessed separately. However, world trade (and thus financial integration) can be undermined by limiting trade finance as a result of tightening financial regulation and supervision after a decade of loose regulation and supervision (e.g. by the implementation of the Basel III capital framework).

Keywords: financial integration, foreign trade, international investment position.

JEL Classification: C23, C36, E44, F36, F42.

1. Introduction

Economic theory and empirical studies confirm that the integration of financial markets allows the capital to be allocated more efficiently (Baele et al., 2004). Financial integration is an important factor in increasing the efficiency of a financial system and lowering the costs for business as well as for consumers. However, some negative effects can be linked with this process. Some capital may hinder the economy without barriers for capital movement, especially the so-called "hot money", which can be transferred from one country to another very quickly and without restrictions and major expenses.

But now we are facing the world financial crisis. By providing better opportunities for risk diversification and better access to funding, financial integration can contribute to financial stability. However, while the expected efficiency gains have materialised, the process of financial integration of the past decade was also associated with an unprecedented accumulation of risks. Investors tried to seek higher yields in riskier market segments and the national and supranational financial regulation and supervisory practices lagged behind the highly integrated, fast expanding and sophisticated financial sector. Thus, the crisis has not only undermined economic and financial stability, but has also led to cross-border financial disintermediation during the crisis (European Commission, 2011).

However, foreign trade (i.e. trade integration) is an important factor influencing financial integration. Lane and Milesi-Ferreti (2003, 2000) mention several important linkages between foreign trade and trade with foreign assets and liabilities. Firstly, a high volume of trade with goods and services evokes the corresponding financial transactions (the financing of exports, providing loans, export insurance, etc.). Moreover, foreign direct investments had a great impact on the external balance of the "new" EU member countries from Central and Eastern Europe; large trade deficits originating from the transformation process (the 90s of the 20[th] century) were compensated by investment inflows (i.e. by increasing financial integration). International trade and international financial flows are thus able to equilibrate the balance of payment (current and financial accounts are interconnected). Moreover, foreign direct investments bring new technologies, know-how or better corporate governance; these factors increase productivity and economic growth and foster the convergence process in transition or developing countries.

Secondly, a high share of bilateral trade linkages between countries leads to a willingness of economic agents to increase the number of financial transactions with these countries. Investors have

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a better knowledge of foreign companies from these countries and are thus more prone to buying the shares of these companies (in comparison with companies from other countries without foreign trade linkages). This phenomenon is known as the "familiarity effect". This behaviour reduces the home bias, when domestic investors prefer the allocation of financial resources into home assets, even if it is not optimal with respect to the country risk profile or expected return on these assets.

Thirdly, a high degree of trade openness of a country reflects the liberal approach of macroeconomic policy authorities not only in the area of foreign trade, but also in the area of cross-border capital flows.

The aim of the paper is to analyse the relationship between financial and trade integration in the EU member countries over the period 1993-2010. We use quantity-based measures of financial integration derived from the countries' international investment positions with a view to the foreign trade. The paper is structured as follows. First chapter is introduction. In chapter two, some remarks on the previous empirical research concerning the analysis of international investment positions are presented. In chapter three, the data, periods and countries and methods used in this paper are described. In chapter four, we describe the process of financial and trade integration in EU10, EU16 and EU26 countries by using various indicators of financial and trade integration. Chapter five contains a graphical analysis of financial and trade indicator. Chapter six summarises the results and brings conclusions.

2.   Previous research

A shortage of data was the main obstacle to analyses of international investment positions several years ago. Only some countries published reliable data about financial assets and liabilities stocks; data about balance of payments were better available. Thanks to the International Monetary Fund and its statistic databases we are now able perform new analyses concerning international investment positions.

The paper focuses on changes in a country's international investment position, especially in foreign assets and liabilities, with respect to foreign trade. Other authors have been interested in related questions.

Lane and Milesi-Ferretti (1999) created a methodology to produce a unique data set containing an estimation of foreign assets and liabilities for a large set of industrial and developing countries for the last three decades. This data set has enabled to analyse the behaviour of net foreign assets in a more complex way. Thus it is one of the first attempts to study the foreign assets and liabilities.

Lane and Milesi-Ferretti (2001) focus on variables influencing net foreign assets. They study the effects of changes in output, public debt, and demographic factors on net foreign assets. The results confirm that changes in these variables influence the direction of international asset trade and can thus explain the evolution of net foreign asset positions.

In another paper, Lane and Milesi-Ferretti (2003) examine the cross-country and time-series variation in the size of international balance sheets. They study the relation between foreign assets and liabilities on one side and a set of various regressors (GDP per capita, trade openness, external liberalisation, financial depth, stock market capitalisation, privatisation revenues etc.) on the other side. They find that international trade and stock market capitalisation are the two most important variables influencing international balance sheets.

Three years later Lane and Milesi-Ferretti (2006) explore the net foreign assets in Central and Eastern European countries for the last ten years, taking into account the composition of their international investment positions. They estimate to what extent the financial integration of these countries has changed compared to developed countries and other emerging countries; they concentrate especially on foreign direct investments, portfolio investments, and external debt financing. They find that the highest share of financial assets is created by foreign direct investments

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and that the main source of investments are the Euro Area countries (in the case of portfolio investments also the USA and the United Kingdom).

Goldberg (2005) explores patterns in the international exposures of U.S. banks, regressing changes in foreign assets and liabilities (the dependent variable) and changes in domestic and foreign real interest rates and real GDP in the United States (independent variables). The author finds that cyclical variables explain very little of the movements observed in cross-border claims.

Buch et al. (2005) analyse whether foreign bank assets react to macroeconomic shocks as the economic theory predicts and how valuation effects influence changes in foreign banks assets. They find that changes in macroeconomic variables do not explain changes in cross-border lending, and that there is significant variability in the response of foreign bank assets to macroeconomic developments.

Kose et al. (2009) analyse the impact of selected macroeconomic variables (the depth of financial markets, trade openness, real GDP per capita, macroeconomic policies stability, institutional quality, and the regulation of an economy) on a country's financial openness (the sum of financial assets and liabilities relative to nominal GDP) in 84 countries from 1975 to 2004. They conclude that foreign direct investments and cross-border flows of equity securities are safer for the economy than cross-border flows of debt securities especially in the case of a low level of a country's financial openness and quality of institutions.

3. Data, period and countries

Data

The data used to calculate the measures of financial integration are from the International Monetary Fund (IMF) International Financial Statistics (IFS) online database, specifically a category called the international investment position (IIP).

An economy's IIP is a balance sheet of the stock of external financial assets and liabilities. In other words, these data summarise the total holdings of financial claims by domestic residents on the rest of the world (financial account total assets) and nonresidents' claims on the domestic economy (financial account total liabilities).[45]

Foreign assets and liabilities include several categories, listed below (including the numbers of rows in the IMF IFS).

Foreign assets (79aad) are divided into six categories:
1. Foreign direct investment abroad (79abd);
2. Portfolio investment equity securities (79add);
3. Portfolio investment debt securities (79aed);
4. Financial derivatives (79ald);
5. Other investment/sectors (79afd);
6. Reserve assets (79akd).

Foreign liabilities (791ad) are divided into five categories:
1. Foreign direct investment in the economy (791bd);
2. Portfolio investment equity securities (791dd);
3. Portfolio investment debt securities (791ed);
4. Financial derivatives (7911d);
5. Other investment/sectors (791fd).

---

[45] The coverage of the various components of IIP is similar to that of the corresponding components under the balance of payments. But the data are not the same. The IIP at the end of a period reflects not only the sum of balance of payments transactions over time, but also price changes, exchange rate changes, and other adjustments.

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Incomplete data for some countries and some years have been completed from the on-line database External Wealth of Nations Mark II (Lane and Milesi-Ferretti, 2007). This database contains data for the period 1970-2007 for 178 economies and for the Euro Area. The data are extracted from the International Monetary Fund, the World Bank, the Bank for International Settlements, and from databases published by individual countries.

Data concerning nominal exports and imports (in USD) are extracted from the on-line database IMF IFS. Data concerning real GDP per capita and nominal GDP (in USD) are extracted from the on-line database IMF World Economic Outlook (WEO) Database (September 2011).

Period and countries

This paper contains an analysis of 26 EU member countries (EU26) and selected subsamples named EU10 (the "new" member countries from Central and Eastern Europe, i.e. Bulgaria, the Czech Republic, Estonia, Hungary, Poland, Latvia, Lithuania, Romania, Slovakia, and Slovenia) and EU16 (the "old" member countries, i.e. Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Malta, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom). Luxembourg was dropped from the sample by reason of an extremely high level of financial integration measured by our indicator. The analysed time period is from 1993 to 2010.

4. Description of financial and trade integration

4.1 Financial integration

The variable $IFIGDP_{it}$ is an indicator of financial integration. It is *a quantity-based measure* of financial integration. This indicator is constructed as follows:

$$IFIGDP_{it} = \frac{(FA_{it} + FL_{it})}{GDP_{it}} \tag{1}$$

where FA_{it} is the stock of total foreign assets of country i in time t, FL_{it} is the stock of total financial liabilities of country i in time t and GDP_{it} is the nominal GDP of country i in time t. Absolute levels of any variable do not reflect the size of the economy properly, can be misleading and are thus not convenient for direct comparisons of different countries. Therefore, it is better to adjust the *IFI* indicator by including the nominal GDP of countries in order to take into account the size of the economy and reveal the true differences in the level of financial integration. The values of this indicator in the case of the EU10, EU16/17 and EU26/27 countries from 1993 to 2010 are illustrated in Fig. 1.
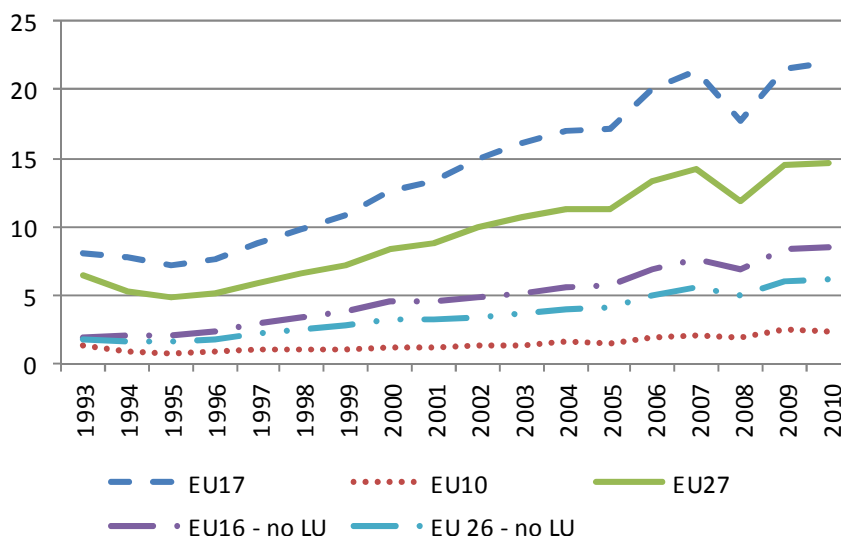
Fig. 1. The *IFIGDP* indicator in EU10, EU16/17 and EU26/27, 1993- 2010 (Source: International Monetary Fund, 2012a,b).

It is apparent that financial integration has been deepening (i.e. increasing) since the beginning of the analysed time period with the exemption of 2008 in all EU countries and also 1994, 2005, 2010 in the EU10 countries. Growth rates were extremely high several years before 2007, i.e. before the beginning of the financial crisis. Fig. 1 contains levels of the *IFIGDP* indicator with Luxembourg and also without Luxembourg ("no LU"). The reason is that the level of financial integration measured by this indicator is extremely high and distorts the illustrative value of this indicator. Therefore, this country was dropped from our sample. The level of the *IFIGDP* indicator is quite different when we compare the average values for the EU10 and EU16 countries. According to these results, it is useful to distinguish between these two subsamples in our analysis. Fig. 2 presents individual country averages of the *IFIGDP* indicator for the period 1993-2010.
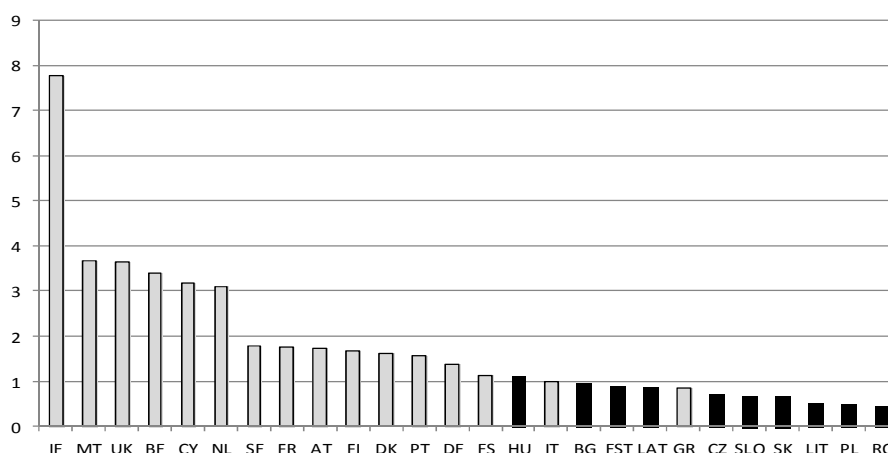

Fig. 2. The *IFIGDP* indicator in EU26 – individual country averages, 1993-2010 (Source: International Monetary Fund, 2012a,b).

The highest level of the *IFIGDP* indicator is in Luxembourg. However, this country is excluded from Fig. 2 again, because its level of this adjusted indicator is disproportionate (80.6) and does not allow a transparent comparison of countries. The second highest level of the *IFIGDP* indicator is in Ireland (15.6); it is more than twice as high as in Malta (7.3), the United Kingdom (7.2), Belgium

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(6.8), Cyprus (6.3), and the Netherlands (6.2). The average level of the *IFIGDP* indicator of the EU10 countries in this period (1.44) is much lower than the average level of this indicator of the EU16 countries (9.9 without Luxembourg, 83.1 with Luxembourg).

The second measure is *the investment-based measure* of financial integration (*GIGDP*): it contains only foreign direct investments and portfolio investments (equity and debt securities). The other categories were dropped from this measure because they are either volatile (other investments) or time series are not long enough (financial derivatives). The construction of this adjusted measure is as follows:

$$GIGDP_{it} = \frac{\left(FDIA_{it} + FDIL_{it} + PEQA_{it} + PEQL_{it} + PDEA_{it} + PDEL_{it}\right)}{GDP_{it}} \tag{2}$$

where $FDIA_{it}$ is the stock of foreign direct investment assets of country i abroad, $FDIL_{it}$ is the stock of foreign direct investment liabilities of the rest of the world in country i, $PEQA_{it}$ is the stock of portfolio equity assets of country i abroad, $PEQL_{it}$ the stock of portfolio equity liabilities in country i, $PDEA_{it}$ the stock of portfolio debt assets of country i abroad, and $PDEL_{it}$ is the stock of portfolio debt liabilities in a country i. The values of the *GIGDP* indicator in the case of the EU10, EU16 and EU26 countries from 1993 to 2010 are illustrated in Fig. 3.
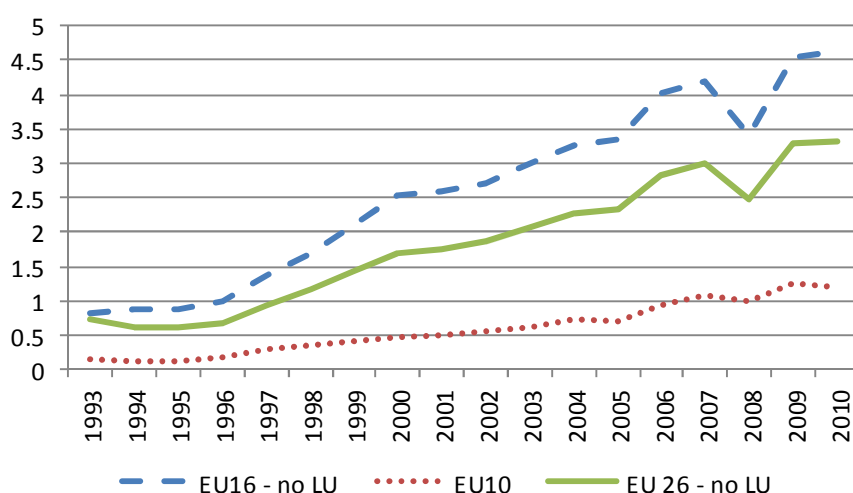

Fig. 3. The *GIGDP* indicator in EU10, EU16 and EU26, 1993- 2010 (Source: International Monetary Fund, 2012a,b).

The pattern of financial integration measured by the *GIGDP* indicator is similar to the pattern measured by the *IFIGDP* indicator. It is obvious, because the *IFIGDP* indicator also contains financial derivatives and other investments and the value of these two items is not too high. Again, the level of financial integration in the EU16 countries is much higher than in the EU10 countries. Fig. 4 displays individual country averages of the *GIGDP* indicator for the period 1993-2010.
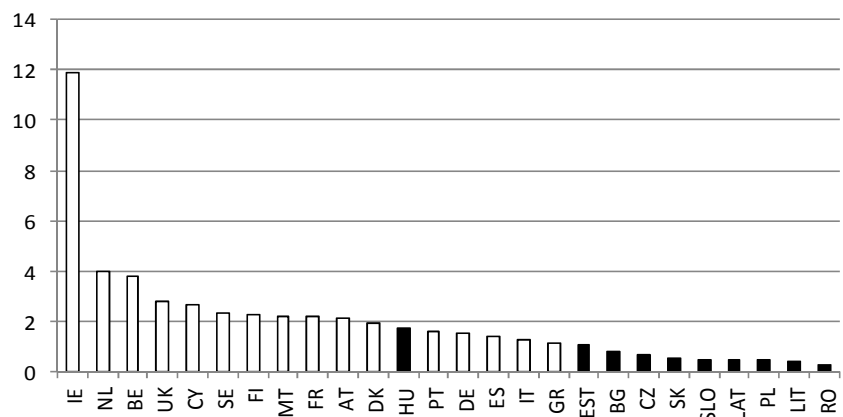
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Fig. 4. The *GIGDP* indicator in EU26 – individual country averages, 1993-2010 (Source: International Monetary Fund, 2012a,b).

The highest level of the *GIGDP* indicator is in Luxembourg (147.9). Again, this country is excluded from Fig. 4 because of the extraordinary values of the indicator. The second highest level of the *GIGDP* indicator is in Ireland (11.9); it is almost three times as high as in the Netherlands (3.9) and Belgium (3.8). The average level of the *GIGDP* indicator of the EU10 countries (0.67) is lower than the average level of this indicator of the EU16 countries (2.81 without Luxembourg).

A third possible measure of financial market integration – *the equity-based measure* of financial integration (*GEQGDP*) – is based solely on the equity cross-holdings – that is, flows of portfolio equity and foreign direct investments. As international trade in debt instruments can be sometimes influenced by special factors, it was omitted in this indicator:

$$GEQGDP_{it} = \frac{\left(FDIA_{it} + FDIL_{it} + PEQA_{it} + PEQL_{it}\right)}{GDP_{it}} \tag{3}$$

The values of the *GEQGDP* indicator in the case of the EU10, EU16 and EU26 countries from 1993 to 2010 are illustrated in Fig. 5.
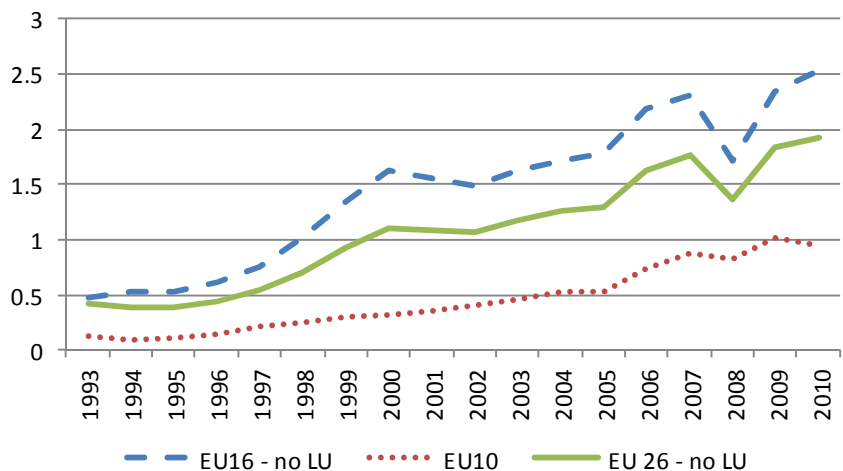

Fig. 5. The *GEQGDP* indicator in EU10, EU16 and EU26, 1993- 2010 (Source: International Monetary Fund, 2012a,b).

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The picture is slightly different compared to the previous two indicators. The average level of financial integration measured by the *GEQGDP* indicator has been increasing since 1993. However, we can see a drop in 2001 and 2002 in the EU26 and EU16 countries (not in the EU10 countries). As this indicator contains only foreign direct investments and portfolio equity assets and liabilities (and does not contain portfolio debt assets and liabilities), the decrease of the indicator (and increase of the *GIGDP* indicator) may reflect the fact that investors from the EU16 countries transferred their assets and liabilities from equity to debt instruments as a result of the collapse of the Internet bubble (the so-called dot-com bubble) and the subsequent crisis in this period.
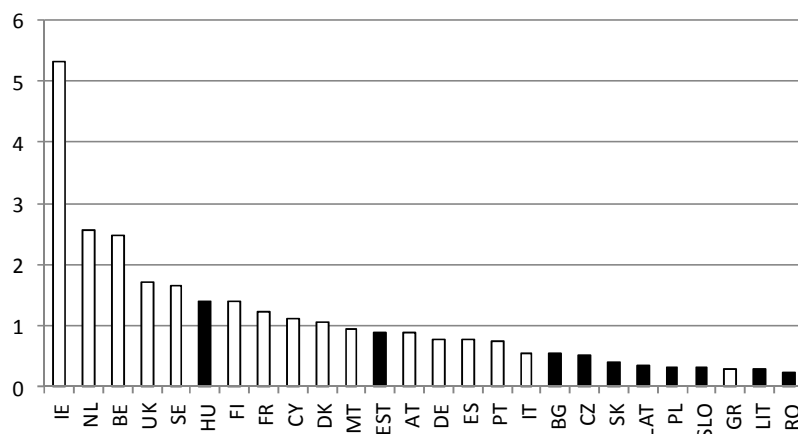

Fig. 6. The *GEQGDP* indicator in EU26 – individual country averages, 1993-2010 (Source: International Monetary Fund, 2012a,b).

Fig. 6 presents individual country averages of the *GEQGDP* indicator for the period 1993-2010. As in the previous two cases, the highest level of the *GEQGDP* indicator is in Luxembourg (85.7). The second highest level is in Ireland (5.3); it is twice as high as in the Netherlands (2.6) and Belgium (2.5). The average level of the *GEQGDP* indicator of the EU10 countries (0.51) is lower than the average level of this indicator of the EU16 countries (1.46 without Luxembourg).

4.2 Trade integration

Trade openness is expressed by using the *TRADEGDP* indicator and this indicator of trade integration is constructed as follows:

$$TRADEGDP_{it} = \frac{(EX_{it} + IM_{it})}{GDP_{it}} \qquad (4)$$

where EX_{it} is the total sum of exports of country i in time t, IM_{it} is the total sum of imports of country i in time t and GDP_{it} is the nominal GDP of country i in time t. The higher the value of this indicator, the higher the country's trade openness is. The values of this indicator for the EU10, EU16 and EU26 countries from 1993 to 2010 are illustrated in Fig. 7.
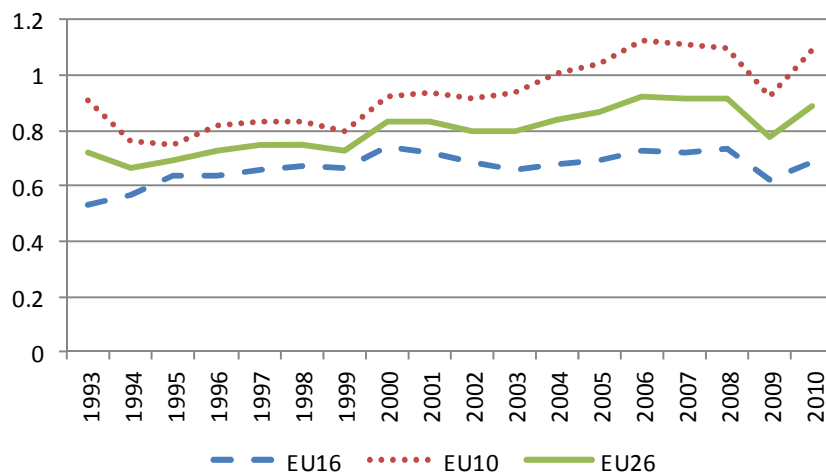
Fig. 7. The *TRADEGDP* indicator in EU10, EU16 and EU26, 1993-2010 (Source: International Monetary Fund, 2012a,b).

As well as financial openness, the average trade openness of the EU countries has been increasing since 1993 (except for 1994-1995 in the EU10 countries). The trade openness of the EU10 countries measured by our indicator is higher than the trade openness of the EU16 countries. Fig. 8 presents averages over the individual EU countries for the period 1993-2010.
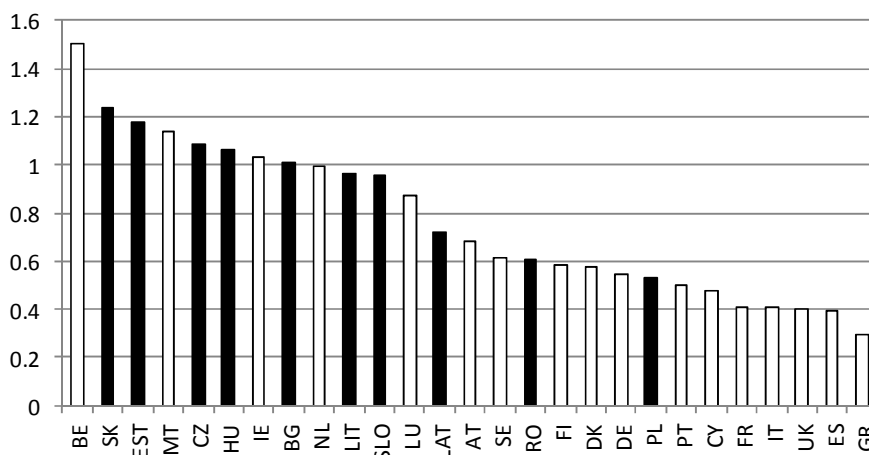

Fig. 8. The *TRADEGDP* indicator in EU26 – individual country averages, 1993-2010 (Source: International Monetary Fund, 2012a,b).

The highest rate of trade openness for the period 1993-2010 was in Belgium (1.5), Slovakia (1.23), and Estonia (1.18). On the other hand, the lowest rate of trade openness was measured in Greece (0.29), Spain (0.39) and the United Kingdom (0.40). According to these data, the average rate of trade openness in the EU10 countries (0.47) is higher than in the EU16 countries (0.33), i.e. these countries are highly dependent on foreign trade.

5. Analysis of financial and trade integration

This chapter contains a graphical analysis of the relationship between the financial and trade integration of the EU countries, i.e. between the *IFIGDP* and *TRADEGDP* indicators. According to results of our empirical studies, there exists a high and significant relationship between financial and trade integration; for a more detailed empirical analysis see Kučerová (2009) or Kučerová (2011).

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Fig. 9 is an illustration of this relationship in period 1993-2010 in the EU10, EU16 and EU26 countries.
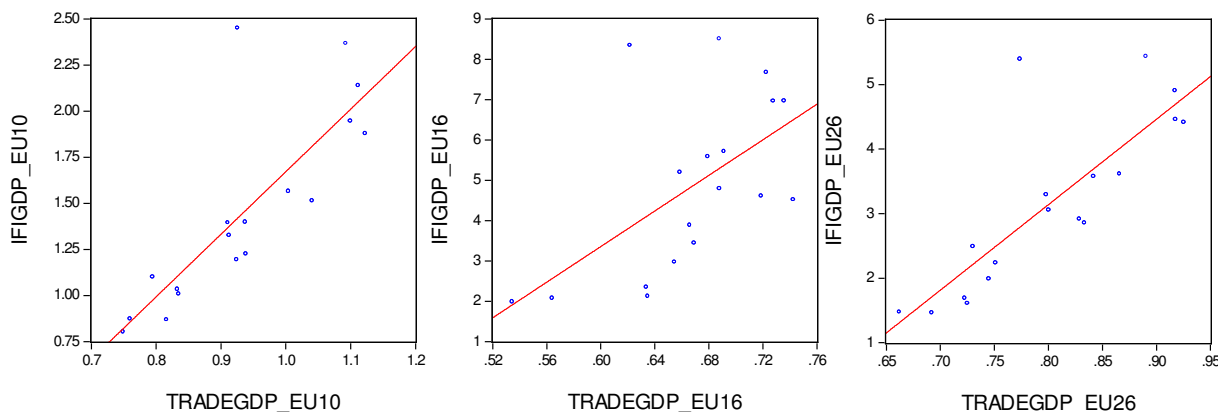

Fig. 9. The relationship between the *IFIGDP* and *TRADEGDP* indicators in EU10, EU16 and EU26, 1993-2010 (Source: International Monetary Fund, 2012a,b, author's calculations).

It is evident that there is a positive relationship between these two indicators. The fitted regression line is steeper in the case of the EU10 countries compared to the EU16 countries, i.e. the progress in financial integration was smaller in the EU10 countries than in the EU16 countries. The correlation coefficient between the financial and trade indicators in the period 1993-2010 is 0.810 in the EU10 countries, 0.573 in the EU16 countries and 0.816 in the EU26 countries, i.e. the degree of linear association is the strongest in the EU10 and EU26 countries. It can be explained by the convergence process of the EU10 countries which these countries underwent especially in the first half of the analysed time period. This process was accompanied by rising foreign trade as a result of finding new trading opportunities in developed European countries instead of former the Soviet Union countries. Financial integration started later than trade integration in these countries, only after the necessary transformation reforms. At the same time, the EU16 countries were preparing for the euro area launch (from 1999) and were pushing the process of financial integration forward. In 2009, the process of trade integration was broken as a result of the crisis but in 2010 was restored again.
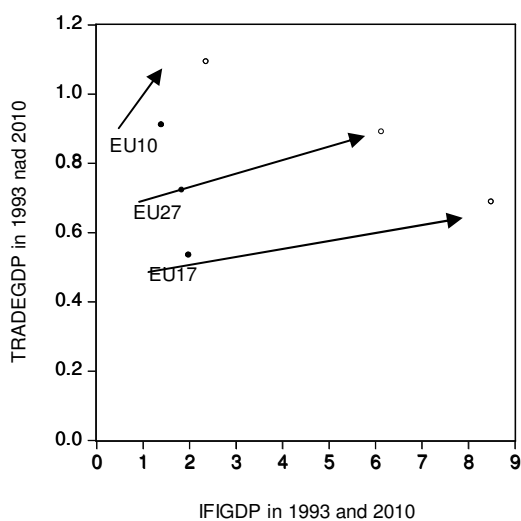

Fig. 10. The *IFIGDP* and *TRADEGDP* indicators in EU10, EU16 and EU26, 1993 and 2010 (Source: International Monetary Fund, 2012a,b, author's calculations).

Fig. 10 demonstrates the direction of financial and trade integration between 1993 and 2010 and confirms this hypothesis. Again, the direction of the change of the two types of integration is steeper and the length of the arrow indicator is much shorter in the EU10 countries, i.e. the pace of financial integration was higher in the EU16 countries than in the EU10 countries. In 1993, the value of the *IFIGDP* indicator was 1.39 in the EU10 countries, 1.83 in the EU26 countries and 1.98 in the EU16 countries. In 2010, the values were even more different: only 2.37 in EU10, 6.14 in EU26 and 8.50 in EU16 (see also Fig. 1). As far as the *TRADEGDP* indicator is concerned, the numbers are different. The average value of this indicator was 0.91 in EU10, 0.53 in EU16 and 0.72 in EU26 in 1993. In 2010, the picture was similar: 1.10 in EU10, 0.69 in EU16 and 0.89 in EU26 (see also Fig. 7).
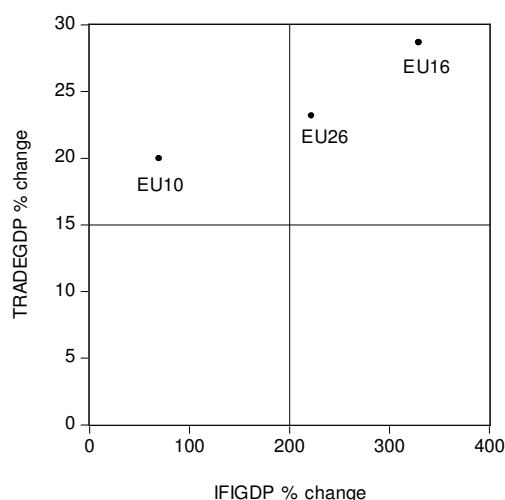

Fig. 11. The *IFIGDP* and *TRADEGDP* indicators in EU10, EU16 and EU26, 1993-2010, % change (Source: International Monetary Fund, 2012a,b, author's calculations).

Fig. 11 represents the average percentage change in the process of financial and trade integration in all three country groups in the period 1993-2010. The average percentage change of financial integration measured by the *IFI* indicator was only 69.7% in the EU10 countries (the EU10 countries are in the left half of Fig. 11), 329.7% in the EU16 countries and 222.2% in the EU26 countries (these two country groups are in the right half of Fig. 11). The level of the *TRADEGDP* indicator increased by 20% in the EU10 countries, 28.7% in the EU16 countries and 23.2% in the EU26 countries over the period 1993-2010. It is evident that the process of financial integration was incredible in the EU16 countries (compared to the EU10 countries) and that the process of trade integration in all EU countries was not as fast as the process of financial integration.

6. Conclusion

The process of monetary integration in Europe has to a great extent influenced the European financial markets because a single currency requires well-integrated financial markets. Financial integration is a substantial condition for introducing a single currency. However, foreign trade (i.e. trade integration) is an important factor influencing financial integration. This paper analysed the relationship between financial and trade integration in the EU member countries over the period 1993-2010. We used quantity-based measures of financial integration derived from the countries' international investment positions with a view to foreign trade

We concluded that financial and trade integration has been deepening since 1993. Both integration processes were only temporarily broken by the world financial crises (the process of financial integration in 2008 and the process of trade integration in 2009). The deepening integration trend was restored one year later in both cases. The progress in financial integration was smaller in the EU10

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countries compared to the EU16 countries, i.e. the pace of financial integration was higher in the EU16 countries than in the EU10 countries. On the other hand, the EU10 countries are more open as far as foreign trade (or trade integration) is concerned. The process of trade integration in all EU countries was not as fast as the process of financial integration. These integration processes are strongly interconnected, i.e. the more the countries trade the more financially integrated they are. It confirms a strong relationship between the two main balance-of-payment components: the current account and the financial account.

However, world trade can be undermined by limiting trade finance as a result of tightening financial regulation and supervision after a decade of loose regulation and supervision (e.g. by the implementation of the Basel III capital framework). Stronger regulatory framework may hinder the world economic growth by limiting trade finance and thus by limiting world trade. And it can negatively influence the process of financial integration not only in the EU. Therefore, tightening the financial regulation and supervision at any rate can be extremely harmful and can put the economic recovery behind.

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LINKS BETWEEN INEQUALITY OF HUMAN DEVELOPMENT AND REGIONAL IMBALANCES

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Abstract. This paper deals with the connection between inequality of human development and the economic development gap among regions. The hypothesis is defined as follows: the smaller difference between the HDI and IHDI is related to lower levels of regional imbalances. The Human Development Index (HDI) combines three dimensions: a long and healthy life, access to knowledge and a decent standard of living. The inequality of access to the available resources is measured by the new multidimensional inequality-adjusted human development index (IHDI) which is based on the same aspects as the HDI but also reflects the unequal distribution of each sub-factor in the population. IHDI is the real indicator of the level of human development, while HDI can be interpreted as the maximum level of IHDI, which could be achieved in the absence of inequalities in the distribution of wealth. An indicator dispersion of regional GDP per capita will be used to measure regional disparities.

Keywords: human development, region, regional disparities, inequality.

JEL Classification: E02, R12, R50.

1. Introduction

Economic inequality, also known as income inequality, the gap between rich and poor, wealth disparity, or wealth and income differences, distribution and redistribution of income, etc. comprises disparities in the distribution of economic assets and income within or between nations or individuals. The term usually refers to inequality among individuals and groups within a society, but can also refer to inequality among countries. In the classic text by Sen (1973), the theory of welfare economics was related to the study of economic inequality. A systematic treatment of the conceptual framework was presented there, as well as the practical problems of measuring inequality.

This article aims to identify and assess the connection between inequality of human development and the economic development gap among regions. To measure the inequality of human development, the Human development Index and Inequality-adjusted Human Development Index (IHDI) were selected. Although IHDI has been developed only recently and therefore does not yet provide long-term data, this index offers a real picture of human development. The regional inequalities are quantified by the index of variance (dispersion) of the regional GDP per capita.

2. Methods

Human Development Index (HDI) was first published in 1975 and since 1990 has been published in periodical Human Development Reports (HDR) within the United Nations Development Program (UNDP). The last comparison in November 2011 included 194 countries and territories, but only 187 to calculate the HDI values (7 countries lacked at least one indicator required for the calculation). The annual HDR in November 2010 brought a new methodology and a change in some of the index parameters:

- a partial factor approach to education was investigated using the education index, which is expressed using a new indicator of expected years of schooling (the expected number of

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years a five-year-old child is about to spend in school) and the average number of years of school attendance in the adult population (number of years spent in school by 25-year-old citizens);

- factors in life expectancy and level of health care were refined using the life expectancy index;
- new use of income index (calculated from Gross National Income per capita in PPP USD data) as an indicator of standard of living.

Individual sub-index values are calculated using both the maximum and minimum reported figure plus the actual reported figures for each country; longevity has an interval of 20 – 83.2 years; the education component intervals consist of: expected total years 0 – 20.6, average education period 0 – 13.2 years and a combined index ranging from 0 – 0.951. The interval for GNI is 163 – 108,211 USD per capita in purchasing power parity.

$$Subindex = \frac{actual\ value - minimum\ value}{maximum\ value - minimum\ value} \qquad (1)$$

The resulting sub-index value ranges from 1 (best outcome) to 0 (worst outcome) and there is a geometric mean value of the HDI (the original HDI was constructed as an arithmetic mean, i.e. without weights).

HDI classifications are relative – based on quartiles of HDI distribution across countries and denoted very high, high, medium and low HDI. Because there are 187 countries, the four groups do not have the same number of countries: the very high, high and medium HDI groups have 47 countries each, and the low HDI group has 46 countries.

An accompanying indicator of human development is the new multidimensional Inequality-adjusted Human Development Index (IHDI) which is based on the same principles as the HDI (i.e. life expectancy, education, and economic level), but also reflects the unequal distribution of each sub-factor in the population (the inequality of access to the available resources). It is calculated for 134 countries as a geometric mean of the whole population for each one of the sub-indices (inequalities in income, access to education, and health care). It can be concluded that IHDI is the real indicator of the level of human development, while HDI can be interpreted as an index of human development potential, or maximum level of IHDI, which could be achieved in the absence of inequalities in the distribution of wealth. The "loss" caused by the human development inequalities is responsible for the difference between IHDI and HDI, and can be expressed as a percentage. The average loss in the HDI due to inequality is about 23 percent – that is, adjusted for inequality, the global HDI of 0.682 in 2011 would fall to 0.525. Countries with less human development tend to have greater inequality in more dimensions – and thus larger losses in human development (UNDP, 2011b).

Norway, Australia, and the Netherlands lead the world in the 2011 Human Development Index (HDI), while the Democratic Republic of the Congo, Niger, and Burundi are at the bottom of the Human Development Report's annual rankings of national achievement in health, education and income, released today by the United Nations Development Program (UNDP, 2011a). The United States, New Zealand, Canada, Ireland, Liechtenstein, Germany and Sweden round out the top 10 countries in the 2011 HDI, but when the Index is adjusted for internal inequalities in health, education and income, some of the wealthiest nations drop out of the HDI's top 20: the United States falls from 4th to 23rd place, the Republic of Korea from 15th to 32nd, and Israel from 17th to 25th. The United States and Israel drop in the Report's Inequality-adjusted HDI (IHDI) mainly because of income inequality, though health care is also a factor in the US ranking change, while wide education gaps between generations detract from the Republic of Korea's IHDI performance. Other top national achievers rise in the IHDI due to greater relative internal equalities in health, education and income:

Sweden jumps from 10th to 5th place, Denmark climbs from 16th to 12th, and Slovenia rises from 21st to 14th (UNDP, 2011b).

Table 1. Inequality Loss in Human Development.

Country	HDI	IHDI	loss (L)	loss in %
Czech Republic	0.865	0.821	0.044	5.09
Slovakia	0.834	0.787	0.047	5.64
Slovenia	0.884	0.837	0.047	5.32
Finland	0.882	0.833	0.049	5.55
Denmark	0.895	0.842	0.053	5.92
Sweden	0.904	0.851	0.053	5.86
Hungary	0.816	0.759	0.057	6.96
Germany	0.905	0.842	0.063	6.96
Netherlands	0.910	0.846	0.064	7.03
Austria	0.885	0.820	0.065	7.34
Ireland	0.908	0.843	0.065	7.16
Estonia	0.835	0.769	0.066	7.90
Belgium	0.886	0.819	0.067	7.56
France	0.872	0.804	0.068	7.80
Luxembourg	0.867	0.799	0.068	7.84
United Kingdom	0.863	0.791	0.072	8.34
Poland	0.813	0.734	0.079	9.72
Spain	0.878	0.799	0.079	9.00
Lithuania	0.810	0.730	0.080	9.88
Portugal	0.809	0.726	0.083	10.26
Cyprus	0.840	0.755	0.085	10.12
Greece	0.851	0.765	0.086	10.11
Bulgaria	0.771	0.683	0.088	11.41
Latvia	0.805	0.717	0.088	10.93
Italy	0.874	0.779	0.095	10.84
Romania	0.781	0.683	0.098	12.55

Source: (UNDP, 2011b, calculation by authors).

The cause of uneven regional development is the occurrence of spatial variability in the socio-economic development leading to the emergence of spatial inequalities. Imbalance of spatial structures in different regions represents the regional disparity and signifies a dissimilarity or disproportion of phenomena or processes having a unique spatial distribution. In terms of a theoretical explanation, it is difficult to define the causes of uneven regional development. Factors such as the size of the country (Williamson, 1965), core-periphery models, technological equipment, and infrastructure affect the local allocation of private capital, and thus predetermine redistribution processes within the economy. Specific factors of regional inequality can be traced in the transition countries in connection with the change of the coordination mechanism (Petrakos, 2001; Ezcurra and Pascual, 2007). Globalization and liberalization was "supposed to be affecting economies positively, i.e. in favor of convergence tendencies" (Baráková, 2011). In the last twenty years, the ambiguous impact of liberalization and globalization of trade has been discussed in the context of regional development (Milanovic, 2002; Rodríguez-Pose and Gill, 2006). Models of "new economic geography" emphasize the relationships between the uneven spatial development and economic growth (Krugman, 1998; Fujita and Thisse, 2002).

Economic performance of the administrative unit (region) is characterized by creation of the gross domestic product. It represents the value of goods and services produced in all sectors in a given territory (state, region) and over a certain period of time (three months, year). The taxes on products are summed with the added gross value, while grants and subsidies are subtracted. GDP is the most comprehensive indicator measuring the macroeconomic performance, inclusive of estimates for the grey economy, non-market production of households, etc. For spatial comparisons of the regional

GDP, the comparison of the regional level to the national level is usually used, or, where appropriate, with transnational units. The comparison of the GDP per capita against the average level EU-27 measured by the purchasing power standards (PPS) is the most frequently provided one. Using of this indicator leads to the conversion of the values of all components of the GDP to the average price level within the EU, and thus to elimination of differences in price levels (or deformations related to the exchange rates of national currencies against the Euro).

European regions with the highest GDP per capita are situated in the south of the United Kingdom, in southern Germany, in northern Italy, and in Belgium, Luxembourg, the Netherlands, Austria, Ireland, and Scandinavia. To the highly developed regions, those in the surroundings of the capital cities are traditionally added: around Madrid, Paris, Prague, and Bratislava. The existence of one or a few economic centers in some of the countries is a natural fact with deep historic roots. At present, this fact is also supported by the tendencies towards centralization of public administration, or by, for example, concentration of local headquarters of transnational corporations. The weakest regions are assembled in the southern, south-eastern, and south-western periphery of the European Union: in eastern Germany and in the new EU member states, in Macedonia and in Turkey. The dispersion of the regional GDP per capita ranges from 28 % of the EU-27 average GDP (6,500 PPS) in the north-west of Bulgaria called Severozapaden to 343 % of the EU-27 average of GDP (85,800 PPS) in inner London in the UK, which is more than 13 times more than the lowest value from the 275 statistically measured EU regions (271 NUTS2 regions in the EU plus three regions of Croatia and Macedonia). The second highest rung was occupied by Luxembourg with 280 % of the EU-27average GDP (70,000 PPS) and Brussels with 216 % of the EU-27average GDP (54,100 PPS). Prague ranked on the 6th place with 173 % of the EU-27average GDP (43, 200 PPS), which is the highest value among the new EU member states. (EC, 2011)

The regional GDP of up to forty regions (19.4 % of the population) exceeded 125 % of the average GDP of EU-27. 56 % of the inhabitants live in regions with the performance of 75 % - 125 % of the average GDP of EU-27; sixty-seven regions (24.4 % of the population) reach less than 75 % of the GDP compared to an average GDP of EU-27. Twenty-seven regions with performance less than 50 % of the average EU-27 GDP are peopled by 9.3 % of the population. Among the regions of different countries there are also apparent significant differences of the economic performance. In thirteen out of twenty-three NUTS2 countries, the measurements revealed more than twice as high differences in the regional GDP per capita. In this group there are seven out of the nine new EU member states and only six out of the EU-15. The largest regional differences, characterized by the share of the most powerful and the least powerful regions, were recorded in Turkey (4.9), the United Kingdom (4.8), and Romania (3.9). The lowest values of dispersion, characterized by the share of the most powerful and the least powerful regions, belong to Slovakia (1.4), Ireland (1.6), and Sweden (1.6). The middle regional disparities with a factor of less than 2 between the highest and the lowest levels of the regional GDP per capita are recorded only in the EU-15, Slovakia and Croatia. (EC, 2011)

For assessment of the development in the regions within the member states, Eurostat has published an indicator of variance (dispersion) of the regional GDP per capita since 2007. The indicator is defined as the sum of absolute differences between the regional (level NUTS 2, respectively NUTS 3) and the national GDP per capita (measured at current market prices and weighted by the regional population share in total population). The indicator of the dispersion of the regional GDP is calculated as follows (Eurostat, 2011):

$$D = 100 \frac{1}{Y} \sum_{i=1}^{n} |y_i - Y| (p_i/P) \tag{2}$$

y_i is the regional GDP per capita of the ith region
Y is the average GDP per capita
p_i is the number of inhabitants of the ith region

P is the population of a country

n is the number of regions in a country

The value of the variance of the GDP per capita is zero if the values of the regional GDP are identical in all regions of the country or the economic zone (as EU27); it rises if the differences in the values of the regional GDP per capita between the regions are growing. For example, the value of 30 % of the variance means that the GDP of all regions of the country weighted by the number of inhabitants in regions varies from the national value by the average of 30 %.

Table 2. Dispersion of Regional GDP at NUTS Level 2.

Country	2009
Netherlands	10.6
Austria	15.1
Denmark	15.2
Germany	16.1
Sweden	19.0
Finland	15.6
Ireland	16.5
Croatia	19.3
Spain	18.5
France	23.1
Slovenia	18.7
Italy	22.3
Belgium	24.2
Poland	20.7
Portugal	23.6
Greece	23.9
United Kingdom	24.9
Romania	30.4
Czech Republic	26.9
Slovakia	33.2
Bulgaria	39.6
Hungary	39.8

Source: (Eurostat, 2011)

3. Results

Firstly, the authors do not deal with percentage loss in human development because they look for absolute loss in each individual country. For the purposes of the research the percentage loss distorts the uneven distribution of resources in the country. The same loss in percentage terms can mean different absolute loss of expression, ie the higher the human development index, the smaller the percentage loss.

Secondly, this paper introduces the initial part of the research, which works with the whole Human Development Index (HDI) and Inequality-adjusted Human Development Index (IHDI). The results for individual sub-index values are not available at the time of the deadline.

$$D = 1/(0.0584101 - 1.87188 \times L^2) \tag{3}$$

The authors of this paper described this relationship using a reciprocal-Y squared-X model to describe the relationship between the index of dispersion and inequality loss. The equation of the fitted model is (2). Since the P-value in the analysis of the variance table is greater than 0.005, there

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is not a statistically significant relationship between the index of dispersion and inequality loss at the 95.0 %. The R-Squared statistic indicates that the model as fitted explains only 8.93174 % of the variability in index of dispersion. The correlation coefficient equals -0.29886, indicating a relatively weak relationship between the variables.
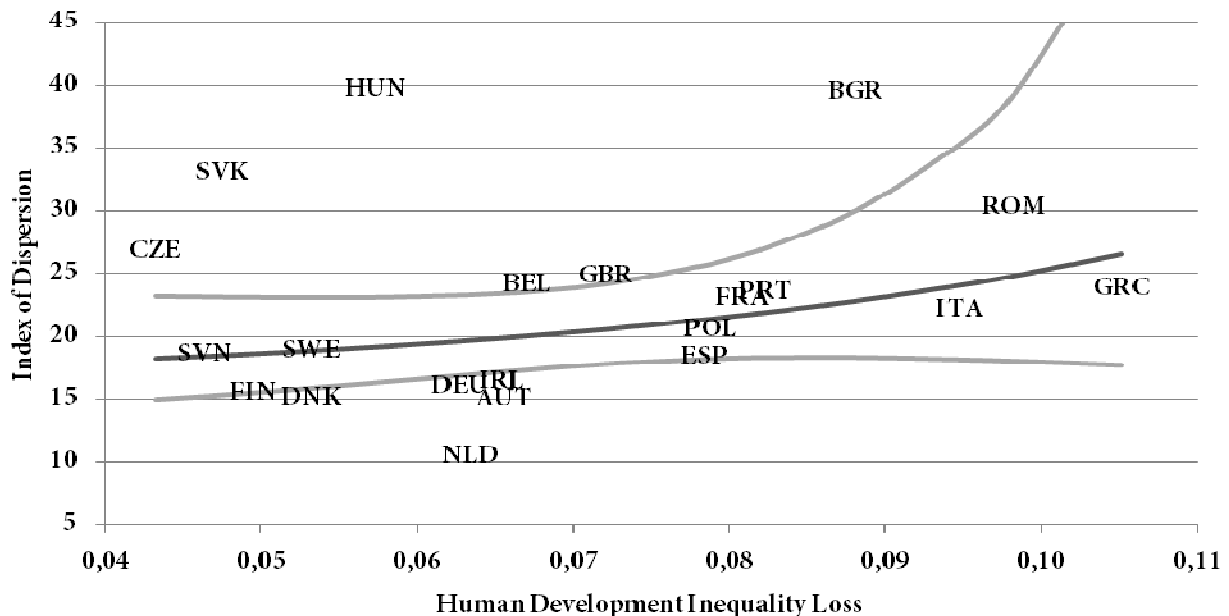

Fig. 1. Relationships between Inequality-adjusted Human Development Index of Dispersion (Source: Eurostat, 2011 UNDP, 2011a,b, calculation by authors).

4. Conclusion

As was shown above, there are very weak links between the inequality of human development and regional imbalances. The following conclusions can be deduced:

1) Regional GDP is often mistakenly seen as an indicator of economic well-being of the population in the regions without taking into account the impact of commuting to work and other limitations of this indicator, such as not accounting for price level differences among regions within countries (e.g. rent of flat etc.) or the effect of labour commuting on the total GDP (Kahoun, 2010). For the calculation of GDP at the regional level, the output approach is often used. The indicator represents the total value of goods and services produced and provided in the region by persons employed in the region. This kind of income is a subject to a number of inter-state transfers to households and redistribution however, which leads to the fact that only a limited extent is related to the population of the region. Regional GDP should be regarded as an indicator of the economic performance in a specific territory, whereas the net disposable income of households is the more representative indicator for the needs of demonstrating regional disparities. This indicator shows rather the level of material wealth of households permanently living in different regions. The main reasons for its marginal use is: a) a restriction for use in international comparisons given very different levels of degree of reallocation among sectors in the EU countries; b) the fact that, as opposed to GDP, the indicator does not serve as an instrument of financial transfers under the structural and regional policy of the European Union.

2) Generally, the provided research has brought further evidence that the standard of using the GDP per capita is too narrow and ignores the importance of other, especially qualitative characteristics of economic development.

3) An alternative indicator to measure regional dispersion has not appeared in available literature yet. Behrens has tried to bring a new regional indicator instead of GDP (see Behrens, 2003), which shifts the positions among the EU regions, but does not measure the imbalances.

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THE REBIRTH OF FISCAL ACTIVISM: HYPE OR HOPE?

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Abstract. The paper focuses on the Great Recession and the related revival of fiscal activism in the United States and other countries. It compares the discretionary fiscal policies with the rules-based ones and discusses the pros and cons of the short-run fiscal stabilization policy measures using both theoretical and empirical arguments. In addition, the paper compares the U. S. fiscal approach with the EU one and speculates on their similarities and distinct features. It is argued that despite the fact that during the recent recession there were very strong objections among a number of reputed economists against the fiscal stimulus, this intervention probably contributed to prevent advanced economies from a long and painful depression. On the other hand, many such economies face the threat of expanded public debts as a consequence of pursued activist policies.

Keywords: fiscal activism, Great Recession, rules-based policies, discretionary policies, United States, EU.

JEL Classification: E62, E65.

1. Introduction

According to the National Bureau of Economic Research (NBER) and its Business Cycle Dating Committee, in December 2007 the U. S. economy went into a profound recession that lasted for 18 months. Similarly, the Centre for Economic Policy Research (CEPR) and its Euro Area Business Cycle Dating Committee identified that the Eurozone entered a recession in January 2008 and remained depressed for 15 months. The „Great Recession" of 2008 – 2009 was a direct consequence of the global financial crisis that emerged in 2007 and this dramatic economic downturn vigorously terminated the „Great Moderation Debate" on the post-war cyclical development of advanced market economies. Also, following this unprecedented and worldwide slump in economic activities the mainstream economics profession once again began to be heavily criticised for producing macroeconomic and financial models not capable of predicting crises, as well as for relying too much on the obsolete neoclassical methodology and assumptions.

Beside the attacks on the prevailing (macro)economic theories and models, the dynamic stochastic general equilibrium (DSGE) framework in particular, the dominant approaches to both the monetary and fiscal policies came under harsh criticism. It was argued by a number of academic economists, policy-makers, and practitioners that the currently popular, rules-based policies were improper vis-a-vis the severe economic problems calling for a sweeping action. As a consequence, along with the debates on the unconventional monetary policy of quantitative easing, the discretionary fiscal policy was revived and the „New Fiscal Activism" entered the scene.

This paper deals with the present revival of fiscal activism reflecting the Great Recession, with a particular emphasis on the implementation of expansionary fiscal policy in the United States and the fiscal policy measures in the European Union (EU). The paper proceeds as follows. The next section gives a comparative overview of the discretionary and rules-based approaches to fiscal policies and discusses the pros and cons of the short-run fiscal stabilization policy measures using both theoretical and empirical arguments. Section 3 presents two major U.S. fiscal stimuli in 2008 – 2009 and surveys existing evidence on their macroeconomic impact. Section 4 briefly describes the EU fiscal approach during the recent recession and speculates on its distinct features. Section 5 concludes the paper.

2. Two Contrasting Approaches to Fiscal Policy

In line with the theory of public economics and finance by Richard A. Musgrave, there are three main economic functions of a modern government in a market economy. These functions are: allocation function, (re)distribution function, and stabilization function (Musgrave, 1959).

As for the stabilization function, the government is expected to use the public budget as a tool for actively managing aggregate demand in order to eliminate or mitigate business cycle fluctuations. While the recessions quite naturally cause budget deficits due to a temporal increase in transfer payments, as well as decrease in tax revenues, the stabilization function requires government to change its behaviour and intentionally stimulate a depressed economy by spending more on goods and services and/or reducing taxes. In other words, the stabilization function does not rely only on the automatic (built-in) fiscal stabilisers, but calls for discretionary counter-cyclical spending and tax measures. Albeit the stabilization fiscal policies were much praised in the post-war era of economic development, they lost a lot of their appeal in the 1970s and 1980s due to the changes in macroeconomic environment and new theoretical progress in economics.

2.1 Discretionary Fiscal Policy

In the spirit of John Maynard Keynes, a discretionary fiscal policy aims at stimulating aggregate demand and employment when an economy is under its potential (or „full-employment") level of output. In a similar fashion, a restrictive fiscal policy attempts to cool an overheating of the demand and tame the inflationary pressures. During the business cycle, this means that an extra government spending and/or tax cuts are required when the economy faces a demand-driven recession, and spending reductions and/or tax increases are introduced in times of boom and prosperity. The rationale for this counter-cyclical demand manipulation lies in the fact that under some circumstances, private consumers and investors do not spend the socially optimal amount of money due to either their „animal spirit", or price rigidity and inflexibility.

For instance, in the liquidity trap the monetary policy can be powerless because the individuals prefer to hoard money rather than spend it. If this situation occurs, fiscal policy appears to be a very efficient way out of recession as an expansionary fiscal impulse does not result in any interest rate increase. With no change in interest rates, there is also no crowding-out of private spending induced by the government and the aggregate demand can rise significantly. The efficiency of fiscal policy is further closely connected with spending and tax multipliers that are considered to be (in absolute term) positive though possibly less than one.

In principle, the discretionary fiscal policy implies counter-cyclical government interventions and (structural) deficits which are believed to be self-correcting in the long run. However, as the empirical evidence clearly shows, in fact the governments often increase budget deficits in booms instead of reducing them, thus conducting pro-cyclical fiscal policies that worsen macroeconomic outlook and public debt.

2.2 Rule-based Fiscal Policy

In 1977, Finn E. Kydland and Edward C. Prescott published an article that strongly argue for preferring rules-based economic policies over their popular discretionary counterparts (Kydland and Prescott, 1977). The argument was clearly made that when people are forward-looking and have rational expectations, it is socially beneficial if the policy-makers adhere to some kind of binding rule of (economic) game instead of conducting activist, hardly predictable measures. In 1980s, this argument, pointing out now the well-known time-consistency problem, became so widely accepted among the vast majority of economists that both the monetary and fiscal authorities gradually stopped from using discretionary policies.

As for a fiscal policy rule, Kopits and Symansky (1998) define it as a „permanent" constraint on fiscal policy. There are different types of fiscal rules such as budget balance rules (or, deficit rules),

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debt rules, and expenditure rules that can be applied either at national or supranational levels. According to Melecký and Macháček (2010), in early 1990s various national fiscal rules were already in place in 53 countries. As for the business cycle considerations, it is important to stress that in contrast to activist stabilization policy, the rule-based fiscal policy is basically pro-cyclical. This means that during a recession period government introduces fiscal austerity measures to offset the deterioration of public finance, and in time of boom it conducts a loose fiscal policy to spend extra tax revenues. Although this government behavior is fiscally responsible and creates good conditions for long-term economic growth, it can also negatively influence short-run macroeconomic performance and stability.

Referring to both the optimal role and conduct of modern macroeconomic policy, some authors (i.e. Eichenbaum, 1997; Taylor, 2000; Feldstein, 2002) mention that in the 1990s there was a strong consensus among the relevant expert community on the undesirability and infeasibility of deliberate fiscal stabilization policies. Before the global financial and economic turmoil launched in 1997, it was generally accepted that governments should, very much in the spirit of the Supply-Side Economics, concentrate on producing an optimum amount of public goods and fiscal reforms stimulating economic growth. Fiscal activism was considered an outdated and discredited approach due to its numerous theoretical and practical shortcomings, for instance not taking into account the rational expectations hypothesis, life-cycle and permanent income theories of consumption and savings, the Ricardian equivalence hypothesis, the Lucas critique, and other theoretical developments that appeared in the 1970s and 1980s, as well as rather low empirically identified values of fiscal multipliers, negative impact of expanding public debt on the long-term interest rates and economic growth, and various delays in the impact of fiscal policy (i.e. recognition, implementation, and response lags).

However, empirical evidence on the effectiveness of fiscal policy is miscellaneous due to the difficulty of measuring multipliers. As Nakamura and Steinsson (2011) highlight, "changes in government spending are rarely exogenous, leading to a range of estimates depending on the estimation approach". (p. 1) And as the government spending multiplier is not a deep structural parameter, "different models, therefore, differ in their implications about the multiplier depending on what is assumed about preferences, technology, government policy and various ⬚frictions⬚. " (p. 1) Therefore it is not surprising that various studies on the size of fiscal multipliers bring different results. In this respect, Hemming, Kell and Mahfouz (2002) find out that the empirically identified expenditure multipliers tend to be in the range 0.6 – 1.4, while the tax multipliers in the range of 0.3 – 0.8. More recent survey of empirical findings can be found in Spilimbergo, Symansky and Schindler (2009), new estimates of multipliers provide Ilzetzki, Mendoza and Végh (2011).

Although discretionary fiscal policies lost their former popularity in the 1990s, the Great Recession was so shocking and atypical that it caused a new way of interest in fiscal activism and counter-cyclical measures. The revival of fiscal interventionism was probably most visible in the United States.

3. New Fiscal Activism in the United States

When we take a closer look at the U. S. recessions during the Reagan and the G. H. W. Bush administrations (see Table 1), we note that these were the periods of conservative fiscal policies responding to economic slumps by spending cuts and tighter tax measures. This stance resulted from the introduction of fiscal policy rules aimed at fighting the ample budget deficits and government expenditures threatening the growth prospects of the U. S. economy. For instance, in the period 1985 – 1990, the Balanced Budget and Emergency Deficit Control Act (better known as the „Gramm – Rudman – Hollings Act") targeting deficits by virtue of automatic spending cuts existed, only to be

replaced by the Budget Enforcement Act (BEA, 1990 - 2002) as another mechanism to reach control over the budget deficits and spending.

Table 1. U. S. Recessions 1980 – 2009.

Period	President	Recession (duration in months)	Lenght of the business cycle (trough/trough, duration in months)
January 1980 – July 1980	J. Carter	6	64
July 1981 – November 1982	R. Reagan	16	28
July 1990 – March 1991	G. H. W. Bush	8	100
March 2001 – November 2001	G. H. W. Bush	8	128
December 2007 – June 2009	G. W. Bush/B. Obama (since January 2009)	18	91

Source: NBER, own creation.

However, during the 2001 recession the G. W. Bush administration changed the existing strategy of fiscal policy and introduced „bonus depreciation" investment incentives, as well as the large temporary tax rebates to stimulate fading aggregate demand (Auerbach, 2009). These discretionary measures were followed by two large fiscal stimuli introduced in 2008 and 2009 to tame the Great Recession.

The first of these anti-crisis measures was the Economic Stimulus Act (ESA), enacted on February 13, 2008, that is yet under the Bush administration. The total costs of this fiscal stimulus were estimated to amount to 152 billion USD for 2008. The act enabled tax rebates to low- and middle-income taxpayers and provided tax incentives to companies to stimulate business investment. In addition, the act increased the opportunities for purchasing mortgages by government-sponsored enterprises (GSEs) Fannie Mae (Federal National Mortgage Association) and Freddie Mac (Federal Home Loan Mortgage Corporation).

Due to the continuing and deepening recession, the second large anti-crisis fiscal measure was introduced only a year later. This was the American Recovery and Reinvestment Act (ARRA), signed into law on February 17, 2009 by President Barack Obama. The ARRA was prepared as a long-term (decennial) economic stimulus package which costs were planned to amount to 750 billion USD over the 2009 – 2011period (i.e. 91.5% of the total costs). In contrast to the Economic Stimulus Act, this fiscal impulse included not only the tax measures, but also large government spending for education, research, health care, infrastructure development, housing, information and communication technologies, national security, as well as aid to low-income workers and the unemployed.

There were many arguments among leading American economists about whether the massive fiscal stimulus was necessary for the U. S. economy to get over the recession and recover. For instance, Feldstein (2009) argued that the stock market decline and the housing market collapse would reduce annual consumption expenditures by 400 billion USD. A subsequent decrease in production and incomes would reduce private consumption for additional 200 billion USD, with the automatic stabilizers able to compensate for only one third of the expenditure reduction. Other economists opposed the return of fiscal interventionism, claiming that the old Keynesianism would not work. They stressed that more government spending would not increase private consumption due to the pessimistic expectations of individuals who suffered from the housing market problems and increasing energy prices. According to these voices, expansionary fiscal policies failed both during the "Great Depression" of the 1930s and in Japan during the Lost Decades (1991 – 2010).

As Taylor (2009) pointed out, instead of reviving invalid fiscal activism, the unconventional monetary policy of "quantitative easing" should be employed to fight the recession because this policy was able to supply the necessary liquidity to depressed markets. The opponents of public spending injection signed a petition against a recovery plan by President-Elect Barack Obama,

containing the words "With all due respect Mr. President, that is not true", which was published by the Cato Institute on January 28, 2009 in New York Times, Washington Post, and Roll Call newspapers. The list of about 200 signatories contained the names of the Nobel Prize winners G. Becker, R. Lucas, E. Prescott, J. Buchanan, T. Sargent, and many other reputable economists (including E. Fama, A. Alesina, or G. Mankiw) who supported the idea of lower tax rates and a reduction in the burden of government as the best ways of using fiscal policy to boost growth. In response to this action, on February 2, 2009 around another 200 economists including the Nobel Prize winners K. Arrow, L. Klein, P. Samuelson, R. Solow, E. Maskin, and D. McFadden sent a letter to Congress which was written by the Center for American Progress Action Fund and in favour of government expenditures. A marked fiscal stimulus was also demanded by the Council of Economic Advisors (CEA) chaired by Christina Romer, Director of The National Economic Council (NEC) of the United States Lawrence Summers, or the Nobel Prize winner Paul Krugman.

The arguments for a large and rapid fiscal intervention, extra government spending in particular, were connected to the fact that the Great Recession was different from previous downturns. In post-war history of advanced capitalist countries, recessions typically resulted from a monetary tightening when a central bank responded to the overheating of an economy and inflation pressures by increasing nominal interest rate under its control. However, during the recent financial and economic crisis, key interest rates controlled by the Fed and many other central banks were almost zero. Therefore the central banks were limited in conducting standard monetary policies by the existing zero lower bound, thus not able to stimulate the economy by decreasing interest rates as they were used to. On the other hand, bond and mortgage interest rates were very hight due to the asset bubble burst and low asset prices, and the credit markets were frozen and not functioning properly as a result of extreme risks and a lack of confidence by commercional banks, firms, and households. Also, the depreciation of dollar could not help very much to expand U. S. net exports as the global demand was too low due to the worldwide macroeconomic problems. Last but not least, obvious risks of the crowding-out effect were quite small as the U. S. economy, as well as some other economies, found itself in a liquidity trap and was facing a deflation.

The empirical evidence on the effectiveness of U. S. fiscal packages is rather mixed. For instance, Taylor (2009) harshly rejected fiscal interventions showing that in 2008, temporal increase in the disposable income of U. S. households resulting from tax rebates, did not affect consumption and aggregate demand significantly. As he found out, in this case the marginal propensity to consume was equal only to 0.13, quite in accordance with the permanent income hypothesis. In addition, he pointed out that contrary to common expectations and beliefs, there were virtually no major recognition nor implementation lags connected to this tax rebate measure and the government was able to give the money back to taxpayers yet during the recession period (compare the Table 1 and 2). On the other hand, Broda and Parker (2008) claimed that the Economic Stimulation Act (ESA) was successful as tax refunds increased household spending by 3.5%, thus stimulating nondurable consumption by 2.4% in the second quarter of 2008.

Table 2. U. S. Rebate Payments in 2001 and 2008.

Month	2001	2008
April	0	23.3
May	0	577.1
June	0	334.4
July	95.1	164.1
August	223.1	12.4
September	144.9	0
October	2.5	0

Source: Taylor (2009).

There exist several studies on the economic impact of the ARRA package, too (CEA, 2010; CBO, 2010; Blinder and Zandi, 2010). In general, these studies agree on the positive impact of this simulus on the U. S. economy, although at the high price of boosted public deficit and debt (see Fig. 1 and Fig. 2).
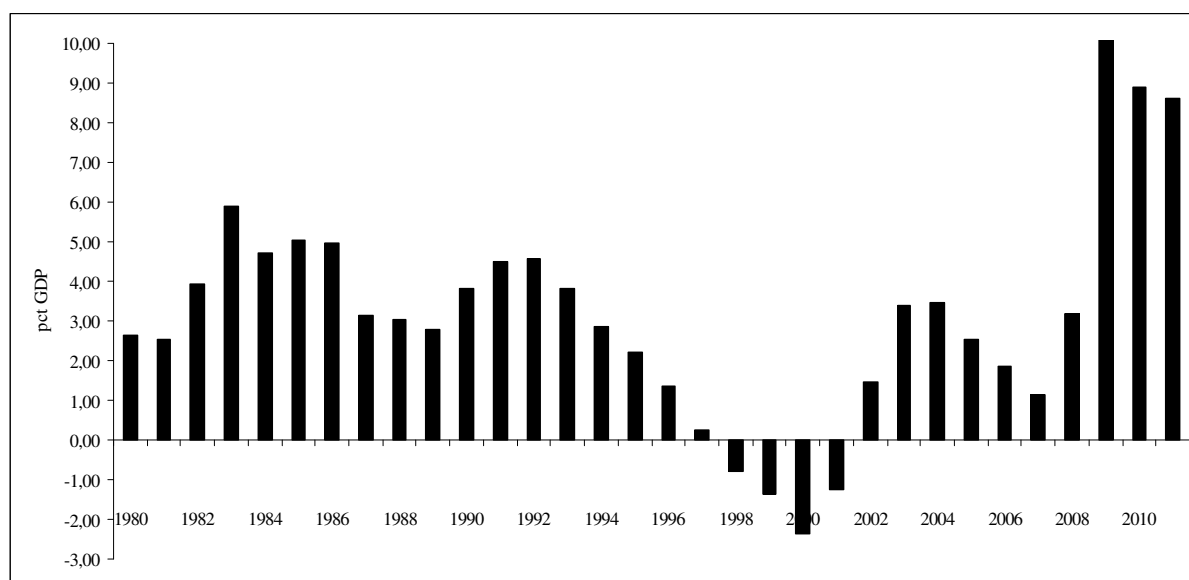

Fig. 1. Federal Deficit (Source: U. S. Federal Deficit, own creation).

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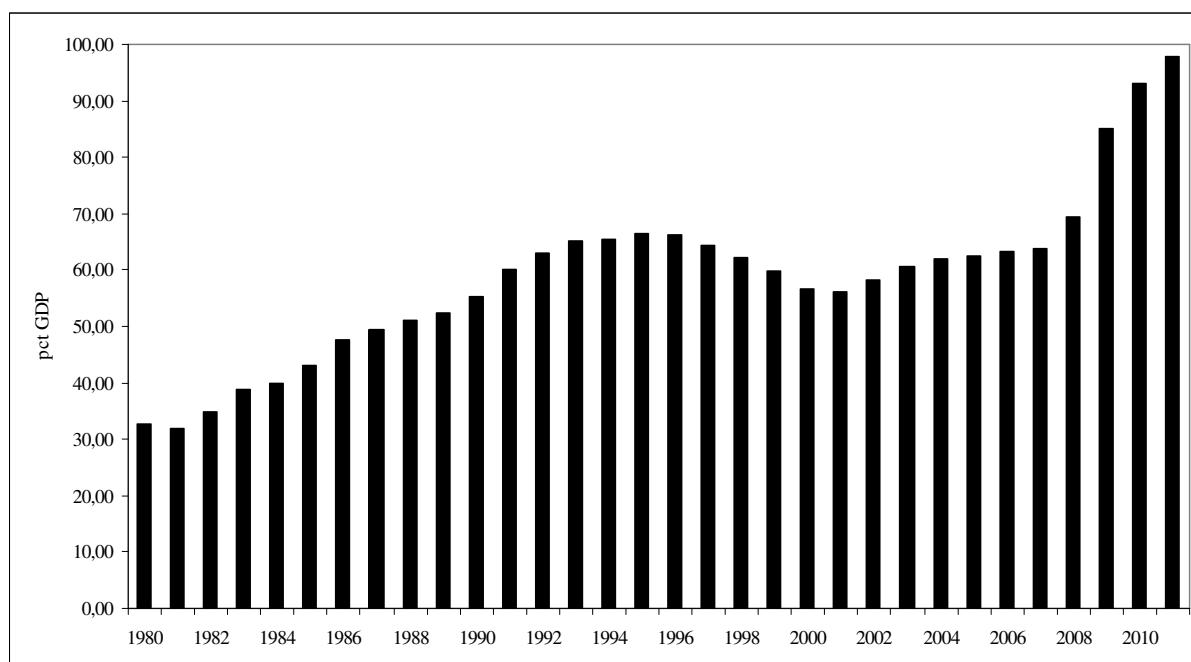Administration in Karvina, 2013

Fig. 2. Gross Public Debt (Source: U. S. Gross Public Debt, own creation).

For instance, using the Moody´s Analytics model Blinder and Zandi (2010) find out that in 2010, the ARRA package induced an increase in real GDP equal to 1.5 percentage points and helped to create 2.7 million jobs. The authors estimate that all the stabilization measures by the public sector (i.e., not only ARRA but also the Trouble Asset Relief Programme – TARP, quantitative easing, and others) probably prevented the U. S. economy from something like the „Great Depression 2.0" because without them, the real GDP would be decreased by 11.5% and the employment would be lower for 8.5 million jobs in 2010. However, as the CEA report concludes, „measuring what a policy action has contributed to growth and employment is inherently difficult because we do not observe what would have occurred without the policy. Therefore, it must be understood that our estimates are subject to substantial margins of error". (p. 36) Nevertheless, the report adds that „The results, however, are strong enough and clear enough that we are confident that the basic conclusions are solid". (p. 36)

4. Was the EU Fiscal Approach Different?

At the first glance, European Union countries had less chance to adopt fiscal activism during the recent crisis than the United States. The reason is that since 1990s, these countries are required to respect two supranational fiscal rules which are still valid and restricting irresponsible national fiscal policies to enforce fiscal discipline.

The rules protecting the common Eropean currency euro are the Maastricht Treaty (1992) and the Stability and Growth Pact (1997). According to these fiscal rules, EU member states must comply with the requirements that their annual public budget deficits cannot be higher than 3% of their nominal GDP and that their national debts must be lower than 60% of their nominal GDP or approaching this value. Although these requirements significantly limit discretionary countercyclical fiscal policy, they were repeatedly violated even before the onset of the European crisis in 2008 (see Schuknecht et al., 2011).

However, when the crisis hit Europe, soon it became apparent that the EU member states needed some coordinated fiscal action to prevent their interconnected economies from decline caused by the international recession. Therefore, the European Economic Recovery Plan (EERP) was approved by the European Council on December 11-12, 2008 both to stimulate the aggregate demand by

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counter-cyclical measures and to reinforce Europe´s competitiveness by "smart" investment. Total planned costs of this package amounted to 200 billion euro (1.5% of EU GDP), of which EU member states were expected to cover 170 billion euro (1.2% of EU GDP) and EU and European Investment Bank (EIB) budgets 30 billion euro (0.3% of EU GDP). Clearly, there were major differences among Member States in their national anti-crisis strategies and the size of stabilization measures. In this respect, Van Riet (2010, p. 25) suggest that "looking in more detail at the composition of the fiscal stimulus packages for the euro area, out of the total of 1.8% of GDP over the period 2009-10, 1.0% of GDP is given by measures on the revenue side and 0.8% of GDP is accounted for by measures on the expenditure side. Concretely, 50% of the fiscal stimulus measures were the measures aimed at households (for instance, income supports, support for housing, tax reductions), 30% represented public investment, 17% measures aimed at businesses (such as tax reductions, subsidies, export promotion), and 5% labour market measures (wage subsidies and active labour market policies in particular). Details on the total fiscal impulse and its components for the Eurozone are given in Table 3. In this table, fiscal impulse is defined as a negative change in general government balance consisting of a change in the cyclical component (the column "Automatic stabilizers") plus a change in the cyclically adjusted balance (the column "Fiscal stance and change in interest expenditure"). As Van Riet (2010, p. 25) remarks, "for Italy, the fiscal stimulus data reflect the net impact of the measures taken in response to the crisis".

Table 3. Total Fiscal Impulse and its Components by Euro Area Country.

Country	Fiscal impulse (p. p. of GDP)			Automatic stabilizers (p. p. of GDP)			Fiscal stance and change in interest expenditure (p. p. of GDP)			Fiscal stimulus packages (levels, % of GDP)	
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2009	2010
Belgium	1.0	4.7	-0.1	0.4	2.2	0.2	0.6	2.5	-0.3	0.4	0.4
Germany	0.2	3.4	1.6	-0.2	3.0	-0.1	0.3	0.4	1.7	1.4	1.9
Ireland	7.4	5.3	2.2	2.0	2.9	0.2	5.4	2.5	1.9	0.5	0.5
Greece	4.1	4.9	-0.4	0.3	1.3	0.8	3.8	3.6	-1.3	0.0	0.0
Spain	6.0	7.2	-1.1	0.3	1.6	0.3	5.7	5.6	-1.5	2.3	0.6
France	0.7	4.9	0.0	0.5	1.7	0.0	0.1	3.2	0.0	1.0	0.1
Italy	1.2	2.5	0.0	0.8	2.5	-0.2	0.5	0.1	0.2	0.0	0.0
Cyprus	2.5	4.4	2.2	-0.4	1.2	0.4	2.8	3.2	1.8	0.1	0.0
Luxembourg	1.2	4.7	2.1	1.8	2.8	0.3	-0.5	1.9	1.7	1.2	1.4
Malta	2.5	-0.1	-0.1	-0.3	1.1	0.0	2.8	-1.2	-0.1	1.6	1.6
Netherlands	-0.5	5.4	1.5	-0.2	3.2	0.2	-0.4	2.2	1.2	0.9	1.0
Austria	-0.1	3.9	1.1	-0.2	2.4	0.2	0.1	1.5	1.0	1.8	1.8
Portugal	0.1	5.3	0.1	0.3	1.3	0.0	-0.2	4.0	0.1	0.9	0.1
Slovenia	1.8	4.5	0.7	-0.1	4.2	0.0	1.9	0.3	0.7	0.6	0.5
Slovakia	0.4	4.0	-0.2	-0.5	2.9	0.4	0.9	1.0	-0.6	0.1	0.0
Finland	0.8	7.3	1.7	0.6	4.1	-0.1	0.2	3.2	1.8	1.7	1.7
Euro area	1.4	4.4	0.5	0.3	2.4	0.0	1.1	2.1	0.4	1.1	0.8

Source: Van Riet (2010).

As it was said above, recent activist fiscal measures arguably helped to save the U. S. economy from a long and much painful depression, though at the cost of a bigger public debt. However, after the Great Recession the economic situation in Europe is much more difficult due to the existing supranational institutional and policy framework in the EU and the Eurozone. Countries such as Portugal, Ireland, Greece, Spain, Italy and recently Cyprus, were badly affected by the ongoing sovereign debt crisis which has clear connection with the deep recession, expansionary fiscal policies, and support for the financial sector. As the negative fiscal development in the Eurozone (see Fig. 3, 4, and 5) is now threatening the very existence of the EU project, it is not easy to consider the revival of fiscal activism in Europe a successful story. It is also important to mention that there exists stark contrast between the current "exit" fiscal austerity policy preferred by Germany and some other

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countries (including the Czech Republic), and more expansionary, pro-growth policy praised by the French President Francois Hollande and his recent U. S. ally President Obama.
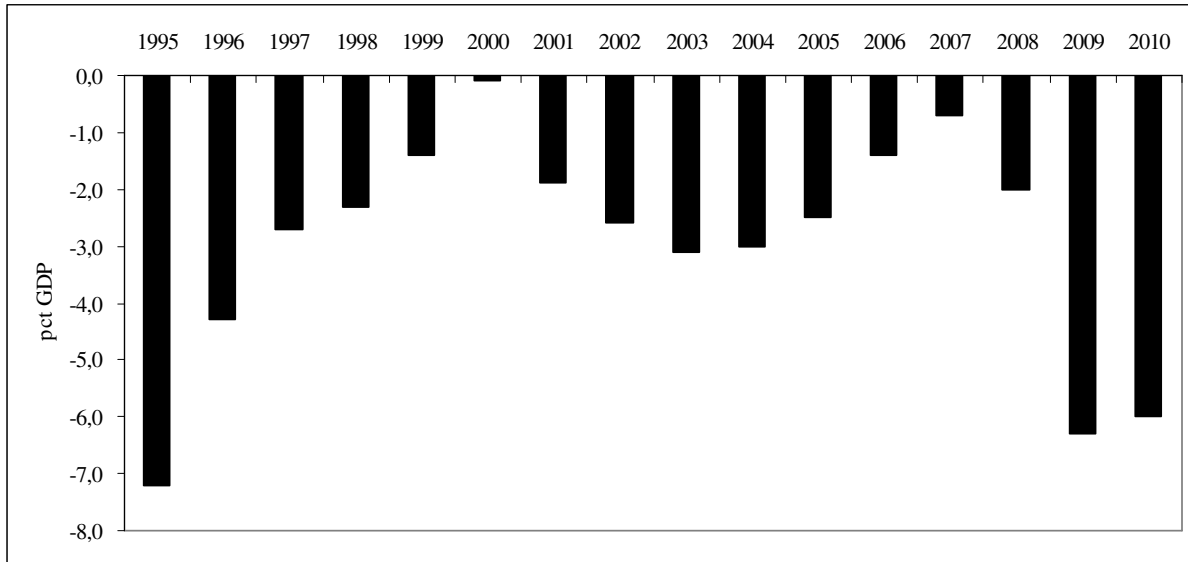

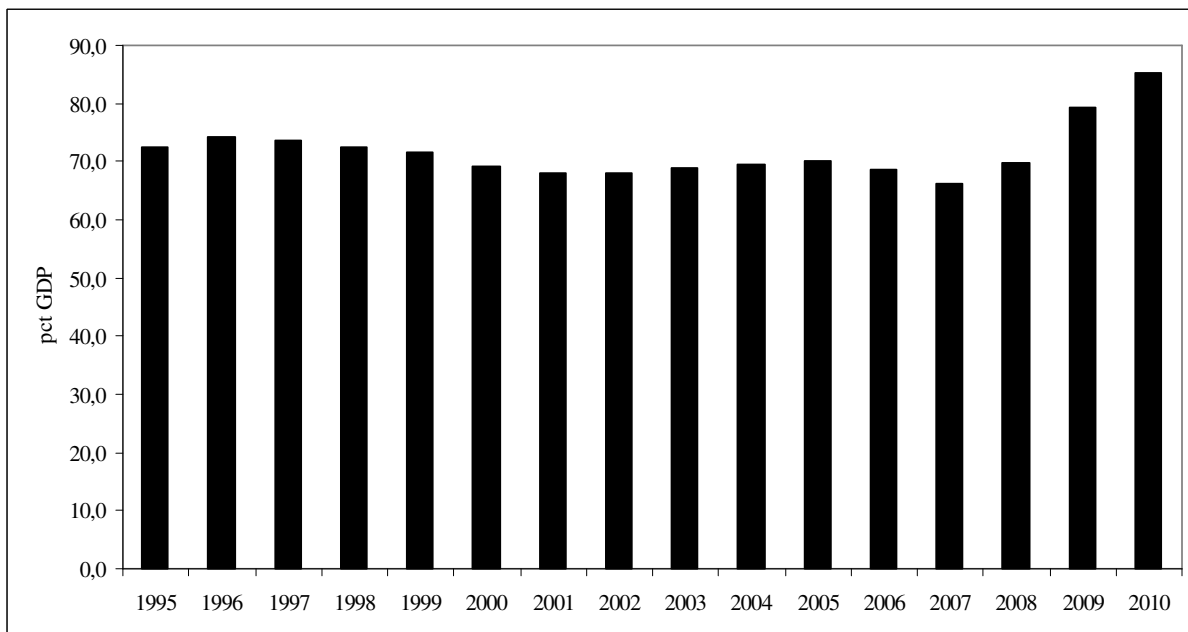**Fig. 3.** General Government Deficit in the Euro Area (Source: ECB, own creation).

Fig. 4. General Government Debt in the Euro Area (Source: ECB, own creation).
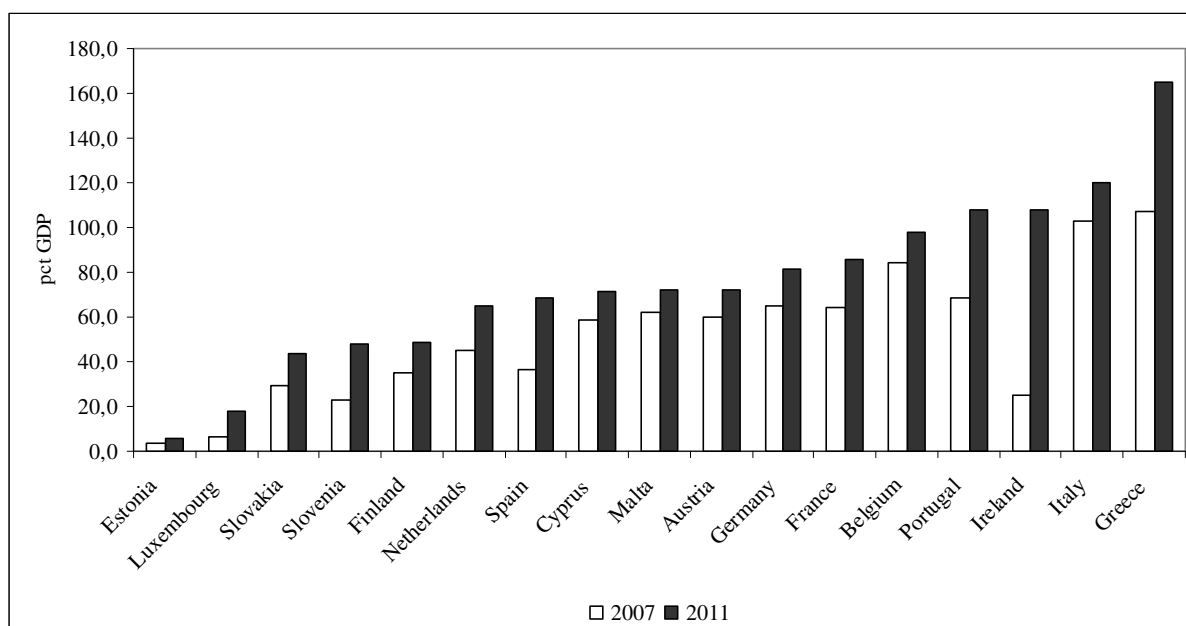
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Fig. 5. General Government Debt by Euro Area countries (Source: ECB, own creation).

5. Conclusion

The Great Recession of 2008 – 2009 was such a deep and virulent economic slump that it revived the Keynesian theory of demand management by discretionary fiscal measures. Despite the fact that in 1990s this theory was widely considered discredited both by the progress in macroeconomic theory and the existing empirical evidence, during the financial and economic crisis it became the basis for conducting intervenionist government policies in many countries, including the United States, EU member states, and China. While the U. S. fiscal interventions can be apparently seen as being successful, though costly, the desirability of recent counter-cyclical fiscal measures in the European Union are much disputable as they contributed to the current European debt crisis.

Compared to U. S. fiscal stimuli, the discretionary fiscal interventions in EU countries were markedly smaller as these countries relied more on the automatic stabilisers. Also, at least part of the EU member states led by Germany abandoned expansionary fiscal policies soon after the Great Recession was over and redirected themselves towards austerity programmes and fiscal consolidation. This is the different approach from the U. S. one which currently points out the importance of sustained fiscal expansion to maintain the economic recovery. However, unlike the United States the European Union is not a single country and some EU member states are so afraid of deficits, debts, and international transfers that they refuse to spend more public funds.

The future of fiscal activism is in the air. Many authors agree that an apparent lack of fiscal multilateralism and cooperation in the European Union significantly reduced effectiveness of fiscal interventions during the Great Recession. (Rommerskirchen, 2011) Hence, if EU countries start speaking with one voice and they succeed in overcoming the current debt crisis, the counter-cyclical fiscal interventions might become more popular even in those European countries that nowadays fear of debts and praise fiscal austerity. Yet if President Obama does not win the next elections, the supporters of activist fiscal policies both in the United States and Europe will be in much more difficult position than they were four years ago.

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INTERNATIONAL DEVELOPMENT COOPERATION OF THE CZECH REPUBLIC: A COMPARISION WITH NEW EU-DONORS

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Abstract. International development cooperation of any state should contribute to poverty reduction, economic and industrial development, gradual integration of economies which are supported by the world economy to develop agriculture, development and consolidation of democracy and human rights, establishment of the rule of law and ultimately contribute to sustainable development along with improvement of environment and quality of life of a country. The aim of the paper is to describe the development cooperation of the Czech Republic and new member states of the European Union. The evolution of development cooperation until 2004 and its Europeanization from 2004 to present is briefly analysed. The paper also evaluated multilateral cooperation and the comparison with other new EU member states as a background of the Official Development Assistance in the European Union. There are also outlined possible development directions of development assistance both of the Czech Republic and the EU as a whole.

Keywords: international development cooperation, official development assistance, bilateral aid, multilateral aid, new donors.

JEL Classification: F35.

1. Introduction

International development cooperation (IDC) is a concept whose importance in today's increasingly differentiating world is constantly growing. The historical roots of this part of the foreign policy of all developed countries back to the 40s of the last century, which are connected not only with the emergence of the United Nations and liberation movements in colonies, but they were also influenced by the power-political bipolarity, often overshadowed by the economic effects of aid provided.

Czech or Czechoslovakian ODA history goes back to the beginnings of decolonization after World War II when the nature of this assistance was influenced by more power-political interests than the pursuit of economic support for the host economy. The turning point came after 1989 when development assistance through its politicization was in decline and its rebirth in the form in which it is known today is dated to the year when the Czech Republic joined the OECD in 1995 and then the EU in 2004.

Nine new EU members of the former Socialistic Bloc showed similar situation – there was an increase in development aid (in proportion to GDP) in most of the states in the first years after joining the EU, although the aid was not well developed conceptually. In the second half of the period the volume of the aid showed instability sometimes even decline in many economies. The Czech Republic is traditionally one of the most stable and biggest donors that is not true in case of other new EU member states.

Future development of international development policy not only of the Czech Republic and newcomers to the EU but the whole EU as well is very uncertain. Even now it is clear that the obligation given to the OECD for old and new EU members will be very difficult to meet for most of the countries. Hypothetical development of IDC that bases on prognosis of political and economical situation in Europe (according to Horký, 2011) indicates possible effects of (in)stability of the integration grouping for this area.

2. Czech International Development Cooperation

Czech IDC has always been realizing through two ways, the first one – pragmatic - with help of which the government pursues national matters (especially security and political) and the other one – idealistic - by which the decline of global poverty is meant (Horký, 2011). The first way was preferential in past by the Czech government, nowadays it is supported by private companies. In the second case the main advocates and supporters are non-governmental non-profit organizations and public opinion.

2.1 Czech International Development Cooperation before 2004

After the World War II Czech development cooperation was based on political direction. The former Czechoslovakia was heavily involved in development assistance even though this cooperation showed unstable development - while in the 50s of the last century it rose sharply, in the 60s (due to reform efforts) was in decline and in late 70s there was an upswing again, which was the most intense in the 80s.

It is more than clear that in the period of centrally planned economy and fighting of the two politically and economically different (groups of) states of the power preponderance, the development cooperation policy was in subordinate position in the global economy. Soviet Bloc countries directed their assistance solely to the states whose political orientation had tremendous interest.

During this period we could view the current development policy of Czechoslovakia characterized as inefficient. We have to realize that it was all ideology and therefore this assistance was directed to developing countries, which were identified as *non-European socialist countries* (Cuba, Mongolia, North Korea, Vietnam, Laos and Cambodia), *countries of priority interest* - there were affiliated Ghana, Guinea, Mali (60s), Afghanistan, Angola, Ethiopia, South Yemen, Mozambique and Nicaragua (80s) and *the countries of Czechoslovak interests in terms of developing long-term political and economic interests* – to this type there were attributed countries with some elements of the central economy such as Algeria, Benin, Guinea-Bissau, India, Iraq, Iran, Congo, Libya, Mexico, Nigeria, Syria and Venezuela.

The year 1989 marked not only for the former Czechoslovakia a change of political system and emerging economic transformation but in connection with those events as well as a shift in international development cooperation. The immediate years after the collapse of the socialist system meant a huge drop in the volume of ODA because of two reasons - first the economy was focused on the transformation to a market economy and it needed the support and second - because it showed highly significant and negative attitude of distrust of the public and politicians for the continuation of ODA policy basis (Kocourek, 2006). Cooperation with developing countries was therefore not on the basis of development, but economic cooperation.

The situation changed in 1995 with joining the OECD and as one of the obligations of Member States which was to give help to developing economies, the Czech Republic renewed this form of cooperation even as first of all the transition countries (in 1996) and ranked within a group of the so-called emerging donors. (Kaplan, 2005) An important document for the provision of ODA became Principles for the provision of international development assistance in 1995, which provides, inter alia, the basic condition for providing foreign aid. The condition for recipient countries was to make efforts to resolve their situation and provide effective assistance (Usnesení vlády ČR, 2009). The criteria for the prioritization of foreign aid were urgency (social and economic level), relationship with the Czech Republic, the level of democracy and human rights in the recipient country and utilization rate (effective cooperation).

When deciding about assistance to a particular country all the above criteria was considered and it was also stated that "with regard to current priorities and national interests, the government may

privilege one criterion over the other," (ibid) which is, also due to China as one of major recipients of bilateral aid and the minimum number of beneficiary countries to LDCs (13%), very often practiced.

The original intention of this approach was a gradual increase in the volume of funding foreign aid to 1.6 billion CZK in 2000, which, by reason of the influence of various factors like the economic problems, will reduce budgetary expenditure and the costs associated with removing the effects of flooding. However, the intention failed as in 1997 it was projected to reduce expenditure by half the amount and in 1998 even by 60%, but the final amount allocated in 1999 was at level of 1996. The development of specific expenditure in the period is shown in Fig. 1.
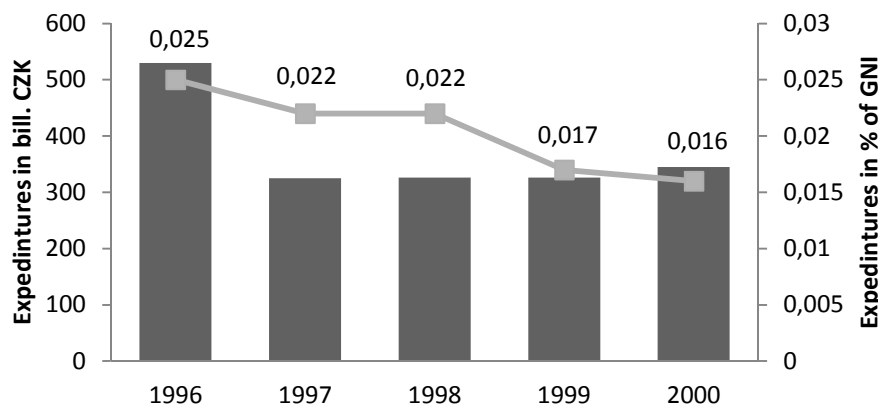

Fig. 1. Evolution of Spending on Foreign Aid Project in the CR 1996-2000 (CZK bill. and % of GNI) (Source: Stojanov and Nováček, 2002, own calculation).

IDC of this period was subsequently criticized by the government and NGOs for its non-conception (many isolated projects) over territorial and sectoral widespread. In the period 1996-2000, the major projects of the Czech foreign development aid were made in forty countries, in 2001 even in fifty states. This fragmentation, combined with low levels of assistance, meant that the most of the money flowed to relatively small projects, thereby the contribution of money management was reduced and the whole system complicated.

At this point, however, could be noted that the above figures relate only to the project of foreign development assistance. The Czech Republic until 2004 was receiving assistance under the Official Assistance (intended mainly for transforming economies and richer developing economies). In the first three years of OECD membership revenues exceeded expenditures on development cooperation. Therefore we can find in the official statistics on the data provided (net) official development assistance since 1998 (see Table 1).

Table 1. Development of net ODA in the Czech Republic 1998-2003 (% of GNI).

	1998	1999	2000	2001	2002	2003
GNI (billion CZK)	1,912.2	1,902.3	1,959.6	2,146.1	2,275.6	2,532.4
ODA (CZK millions)	516.3	511.5	623.6	1 007.2	1 485.9	2,556.0
% share	0.028	0.028	0.032	0.047	0.065	0.101

Source: Stojanov and Nováček (2002, p. 3) (for 1998), Adamcová (2006, p. 78) (years 1999-2003), own calculations.

The Czech government adopted in December 2001 Concept of Foreign Development Assistance of the Czech Republic for the period 2002-2007, which had some shortcomings. This section of the paper will focus on its performance in the first two years IDC has undergone since Czech EU entry to other treatments. The legal document caused not only organizational changes, but also integration of foreign aid to foreign policy, in particular territorial specification, which brought a narrowing of assistance to twenty of the fifty states (Yugoslavia and Kosovo, Bosnia and Herzegovina, Macedonia, Uzbekistan, Ukraine and Kazakhstan, Lebanon, Palestine and Yemen, Vietnam, Mongolia and

Afghanistan, Namibia, Angola, Mali, Burkina Faso and Ethiopia, Nicaragua, El Salvador and Bolivia[)].

The framework objective was to contribute to poverty reduction in less developed countries of the world through economic and social sustainable development. The following milestones which can be summarized in three points were also set: support democracy, human rights and social justice, equal participation of developing economies into the global economy and sustainable development with emphasis on the environmental component.

In terms of prospects for the Czech Republic to the European Union, a very important commitment of EU member states was declared at the Barcelona Summit in March 2002, ie. to pursue at least 0.33% ODA/GNI for each member state, and 0.39% ODA/GNI as the average for the whole EU in 2006 and 0.51% in 2010 (Long-term goal is to achieve the UN 0.7% ODA/GNI by 2015).

Taking into account the amount of funds spent on development cooperation, this period can be considered as being successful. The overview in table 6 shows that the total volume of the Czech ODA in 2003 reached 2556 billion CZK in comparison with almost half the figure reported in 2002. Part of the increase must be attributed to the rate of the CZK against the U.S. dollar (crown strengthened against the dollar by 16% in one year). In addition the real growth in ODA between 2002 and 2003 amounted to 69%. This is the highest annual growth in the history of Czech ODA which meant higher growth than of any of the existing members of the OECD/DAC (Belgium reported the highest increase of 43%).

2.2 Europeanization of Czech International Development Policy after 2004

The year 2004 was significant for the Czech Republic not only in terms of acceptance into the European Union but also from the perspective of development cooperation, it ceased to be the recipient of this type of assistance (in Official Assistance) and became its sole donor.

The Czech Republic (CR) as a member of the European Union (EU) and the international community of democratic and economically developed countries recognizes the principle of solidarity among people and among states and accepts its responsibility for resolving global problems. One expression of this attitude is the Official Development Assistance (ODA), which is an integral part of Czech foreign policy. CR in accordance with EU principles and the protection of its interests conducts and provides its own IDC and both bilateral and multilateral basis. (Preambule Usnesení vlády č. 302, 2004)

Already at the time of Czech international development cooperation (IDC) a conception for the years 2002-2007 was designed in two phases: before (first phase) and after entry into the European Union (second phase). Even before its official entry into the government in March 2004 it accepted principles of international development cooperation after joining the EU, which meant a further shift in policy of foreign aid. First, international cooperation was built on a comprehensive medium-term strategy, which should enable all parties to plan activities efficiently and, second, both have been set (due to the constant criticism of fragmentation ODA) to further reduce the priority recipient economies. In 2007 another resolution was adopted by the government to transform the system of the Czech Republic IDC which prepared the conditions for adoption of new principles of ODA for the period 2010-2017 and it should have been the input of the Czech Republic to the OECD Committee DAC (conditions in details see in Kaplan, 2005).

Main part of IDC (to 2010) was established within the cooperation of ten countries - eight priority (Angola, Bosnia and Herzegovina, Yemen, Moldova, Mongolia, Serbia and Montenegro - since 2006 only Serbia - Vietnam and Zambia) and two medium priority countries (Afghanistan and Iraq). Selection of the recipient economies was based on territorial priorities and sector priorities were defined - immigration, industry promotion, education, health, agriculture, environment and sustainable development.

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In addition to the priority countries for bilateral cooperation in the field of development cooperation, there is also another group of priority countries in the so-called transformational program of cooperation where the beneficiaries do not meet the condition criteria of democracy and it helps them to achieve. Among recipients are included Burma (Myanmar), Belarus, Bosnia and Herzegovina, Georgia, Iraq, Moldova, Cuba and Ukraine (MZV ČR, 2009b). Since 2009 IDC collaboration has started with the so called non-programming countries, i.e. countries that are not priority countries, but they initiated new projects (MZV ČR, 2010). These countries are Ethiopia, Georgia, Cambodia, Kosovo and the Palestinian autonomous territories. Other developing countries which are finalizing their yet initiated projects belong among the non-priority countries.

New strategy of the Czech Republic was adopted in 2009 (The Development Cooperation Strategy of the Czech Republic 2010-2017, MZV ČR, 2009a) and the countries are divided into three categories: *programme countries* - Afghanistan, Bosnia and Herzegovina, Ethiopia, Moldova and Mongolia, *project countries* - Georgia, Cambodia, Kosovo, Palestinian Autonomous Area and Serbia and *phasing-out countries* (Sládková, 2011) – former programme countries Angola, Yemen, Vietnam and Zambia.

New sector priorities were also established - environment, agriculture, social development (education, social and health services), economic development (including energy), promotion of democracy, human rights and social transformation.

ODA of the Czech Republic should thus have the same structure as ODA of other EU member states (and members of the OECD) – the share of these types of cooperation (bilateral - multilateral) is 70:30 for members of the DAC, but ratio of most new member is opposite (see later). Although the Czech Republic after accession to the EU committed itself to increase its share of ODA to GNP, the goals set for the new member countries, 0.17% ODA/GNI till 2010 and 0.33% in 2015, fail to comply. The fulfillment of the share of bilateral and multilateral aid is equally difficult - the proportion was 47/53 in 2009 (Sládková, 2011).

The Czech Republic meets the so-called model of continuous growth (FoRS, 2008, p. 14-15), which represents a compromise between the model without any real growth (projected a decline in proportion 0.09% ODA/GNI in 2010) and the ideal model (compliance with the above criteria). This model assumes an annual increase of 0.01% per annum, which in 2008 succeeded but from 2009 has not reached this level, according to predictions (see Fig. 2).
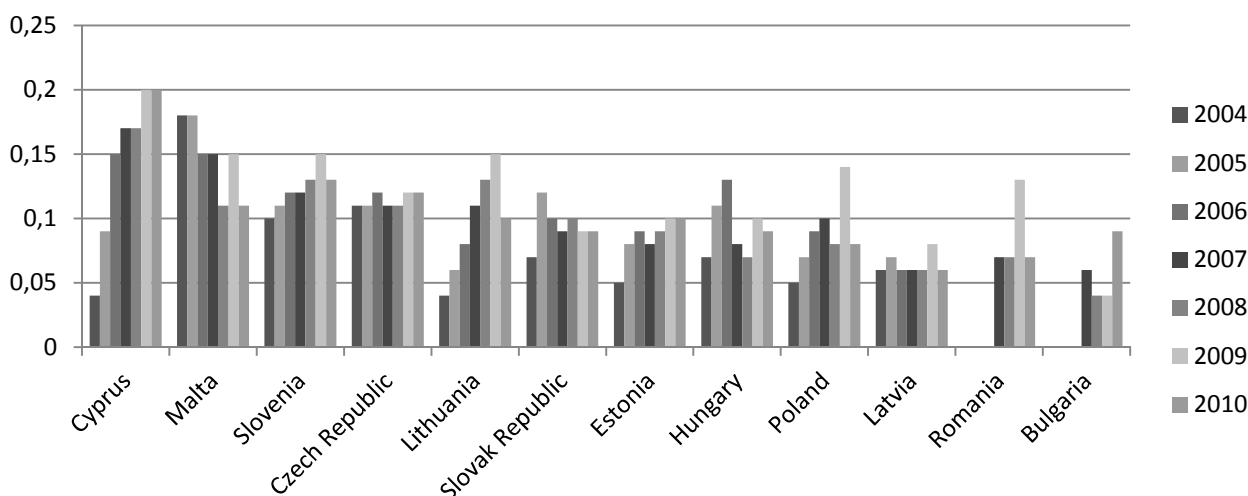

Fig. 2. Comparison of ODA Development of new EU Member States in the Years 2004-2010 (% of GNI) (Source: OECD Statistic [online], EC, 2011a, b, own calculation).

3. Comparison of the Development Cooperation with other EU Member States

The Czech Republic since its entry into the European Union has been compared with eleven other new member states, the taxpayers and above-average foreign aid, which puts it in fourth place behind Cyprus, Malta and Slovenia as shown in Fig. 1. From this figure it is clear that the economic development of these countries affected the amount of ODA most - the most progressive development was recorded in case of Lithuania, while records fell in ODA of Malta. The least stable in the field of international development cooperation are Hungary and Poland, while stable development of the Czech Republic was recorded along with Slovenia and Lithuania. It is also obvious that the only state that currently meets the criteria of holding 0.17% of GNI is Cyprus and it seems that remain economies are problematic in approaching to this criteria.

In comparison with the Member States of the DAC the Czech Republic, nor any of the new donor countries (except Cyprus), does not reach the minimum share of contribution of DAC/EU countries - the smallest donor (Italy) average share of ODA/GNI was 0.17 % in 2004-2010 (see Table 2). In 2011 the situation remained the same in some countries, but it changed diametrically in other ones (in Table 2 marked in bold italics).

Table 2. Comparison of EU Member States' ODA as the Average for 2004-2010 and 2011 (% of GNI).

Rank	Country	Score	2011	Rank	Country	Score	2011
1.	Sweden	1.01	1.01	15.	Italy	0.17	0.19
2.	Luxembourg	0.99	0.99	16.	Cyprus	0.17	0.16
3.	Denmark	0.87	0.86	17.	Malta	0.14	*0.25*
4.	Netherlands	0.81	0.78	18.	Slovenia	0.13	0.15
5.	Ireland	0.55	0.52	19.	Czech Republic	0.12	0.13
6.	Belgium	0.55	0.53	20.	Poland	0.10	0.08
7.	United Kingdom	0.50	0.56	21.	Lithuania	0.10	0.13
8.	Finland	0.50	0.52	22.	Romania	0.10	0.09
9.	France	0.46	0.46	23.	Slovak Republic	0.09	0.09
10.	Spain	0.41	*0.29*	24.	Hungary	0.09	0.11
11.	Germany	0.36	0.40	25.	Estonia	0.09	0.12
12.	Austria	0.35	*0.27*	26.	Latvia	0.07	0.07
13.	Portugal	0.24	0.29	27.	Bulgaria	0.06	0.09
14.	Greece	0.18	*0.11*				

Source: OECD (2011), EC (2012), own calculation.
Note: Data for Romania and Bulgaria are available from 2008.

The above comparison, especially connected with efforts of the Czech Republic to be admitted to the DAC, is not overly optimistic. The negative trend also shows the ratio of bilateral and multilateral aid, which is moving in the "old" EU member states in the ratio 70:30 and it is not considered that it should exceed 60:40. The Czech Republic as one of the four new EU members in 2008 exceeded both the above conditions together with two other traditional multilateral donors Italy and Greece (see Fig. 3). We can see that some economies showed an increasing trend – in particular Hungary, Slovak Republic or United Kingdom. It is closely related to the contributions to the EU budget and the European Development Fund (in the Czech Republic contributions to the EU formed in 2008 almost 90 % of total multilateral aid).
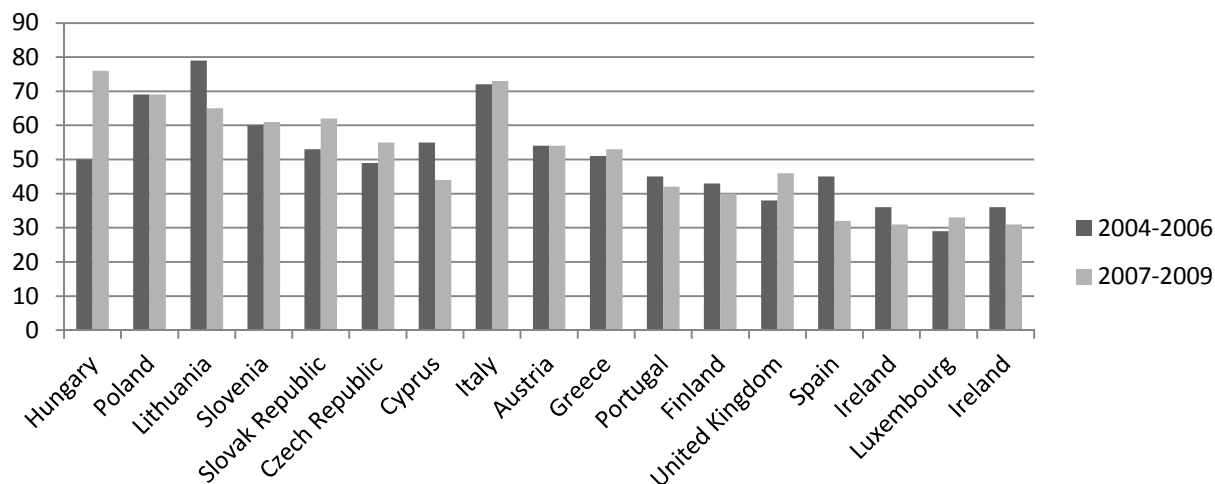
Fig. 3. The Share of Multilateral Aid in the Czech Republic in 2004-2009 compared with selected EU Member States (in % of total ODA) (Source: OECD, 2009a, OECD, 2011, own creation).

4. The Future of International Development Cooperation EU – a Free Rider or Wise Lady?

It is very interesting to look at future through the model of four scenarios that base on management and proceed from two basic criteria – possibility and willingness to solve global problem on international level and fulfilment of international obligations in the Czech Republic. On the basis of the mentioned criteria Horký (2011) created scenarios of Czech development cooperation that can (due to their internationalization) be applied to every EU newcomer (see Fig. 4).
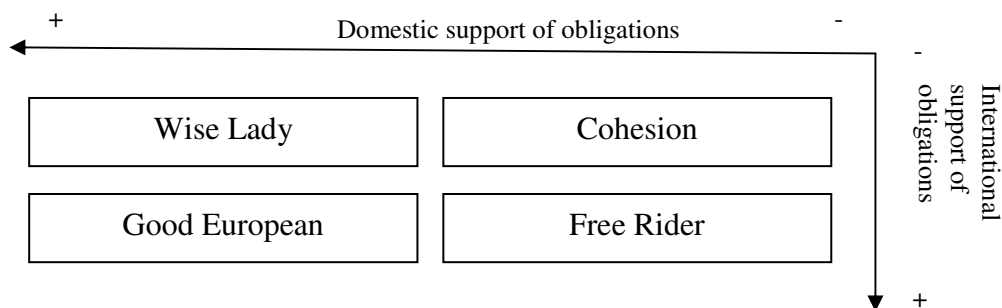

Fig. 4. Four Scenarios of International Development Cooperation (Source: Horký, 2011).

Cohesion

The scenario as the most pessimistic option represents the lowest level of support of development cooperation on international as well as national levels. This situation might be caused by many factors – e.g. a slowdown in growth of Chinese economy as well as world economy and national economies subsequently; decline in willingness to accept development aid (frequently tied aid) by developing economies from the EU due to huge increase in aid from China, Russia or India; migration pressures and their negative perception or refusal of immigrants (creation of certain "cohesion") or failure in achieving Millennium Development Goals. This situation on international scene might impact national scene – development policy can become marginal matter of political parties due to global problems and be reduced to provide humanitarian aid only which could be connected with certain isolation of national development policy, it means "cohesion" on national level.

Free Rider

The second scenario is less pessimistic than the first one concerning international support but in case of national support the situation is the same, i.e. low domestic support. Development aid might be reflection of the development in the EU that would be characterized as a two-speed development. Meanwhile traditional biggest donors would continue increasing and deepening the concept of international development aid (connected with rising participation on GNI) within the EU, other donors would follow the negative trend and slow pace in aid growth. Those states would not achieve the set level of development aid (participation on GNI) and would become the so called "Free Riders" in two-speed Europe.

Wise Lady

The scenario is a complete opposite of the "Free Rider". Its main characteristic is an unfavourable development of development support abroad, but a greater support of domestic agenda. Development cooperation in this case is based on tight cooperation with non-government organizations and establishing new branches of government agencies which would cooperate closely with local development communities. All that could lead to achieve the EU goals (ratio of development expenses to GNI) by widening the number of DAC members. Development policy would be supported not only institutionally, but on academic field as well by e.g. creating researching groups, educating a circle of interested people (students, public) about more and more debated development problems. The states advocating the concept could become "Wise Ladies" being aware of benefits not only for national but also international matters.

Good European

The last of these four scenarios is based on positive echo on domestic and international development scene. To follow national goals, supported by fulfilment of obligations set by the EU and Millennium Development Goals would lead to provide aid more efficiently, effectively and by more prestigious givers. It would have to be followed by higher responsibility of developing countries governments and involvement of civil society. Positive effect might bring more active cooperation among particular countries within DAC that could lead to better worked-out development agenda in sense of taking and carrying out delicate topics such as support of disadvantaged groups of people; improvement of the position of women and senior citizens within the society etc. These steps would contribute to build status of "Good European" not only in the EU.

It is the question, which of those four scenarios and their adaptation to real life conditions might be expected. Horký (2011) created the scenarios for year 2020, i.e. 8 years later, stressing their boundary form. These eight years is a very short time from development cooperation perspective and even nowadays the behaviour of all interested participants in that field can indicate the future of the cooperation. It all depends on stability in the EU (from international obligations perspective) and political will to hold a dialogue and make changes in development cooperation field (from national support view).

Nowadays it seems that Czech development cooperation aims for the scenario of "Free Rider" because a slow increase in development aid, small willingness to join EU collective negotiations and missing visions of international development cooperation support absolutely this opinion. So that the Czech Republic would become "Wise Lady" or "Good European" it would be necessary to make many practical changes (e.g. better cooperation with non-government organizations, higher competences of Czech development agency, better community work on the areas of supported economies or following the rule of aid necessity) together with political will.

5. Conclusion

International development cooperation is an integral part of all EU member states and it has a tradition that dates back to the beginnings of this integration grouping and in economies themselves till the period after World War II the Czech Republic included. This kind of cooperation has its basis in two main ways – pragmatic - by which governments control national matters and idealistic - into which they are pushed by public opinion and non-profit organizations. To find an ideal situation, which means the right proportion between antagonistic items usually, it is very difficult for every government and it cannot be said certainly if it succeeds. Anyway there is an effort to give money where it is beneficial politically and, together with it, the means help to decrease poverty. This kind of aid is called tied aid, is linked to non-supply of donor countries and is often criticized because of advancing its own interests economies. On the other hand, why not combine assistance with the growth of the domestic economy operating on the principle of "if I develop myself, I can give you more resources to develop yourself".

Looking at the development of IDC in member states over last years, then in 2008 ODA recorded the largest growth, 10.2% (OECD, 2009a), in 2009 fell by 2.1 % (Alpízar, 2010). In 2010 development assistance grew in absolute terms but nearly half of the member states of the DAC/EU reduced the volume of development cooperation citing the impact of financial crisis and also showed similar results with non-DAC states (¾ of EU-12). The decline in absolute amount did not show in the case of the Czech Republic any change in the share of ODA/GNI, Slovakia, however, experienced a drop in both parameters (and thus get to the level of Poland) and in case of Hungary only two indicators increased (and thus received support from Slovakia and Poland). In 2011 ODA decreased generally by 2.7 percent compared with 2010 and in DAC/EU member states it was 0.45 % of their GNI, non DAC members only 0.23 per cent. According to OECD (2012) the lowest decline (due to persistent internal problems) recorded Greece and Spain (down by 39, respectively 33 percent), the largest increase reported Italy (33 percent and 10 percent of Sweden, which surpassed one percent of GNI). In the new member states Estonia and Hungary showed the highest increase (21 resp. 16 percent), followed by Slovakia (10%), Czech Republic and Poland (6 and 4 percent).

From 1 July 2010 entered into force the "Law on international development and humanitarian assistance to foreign countries" (Law No. 151/2010 Coll.), which completes the process of transformation and development cooperation: it should be the basis for the Czech Republic's accession to the DAC/OECD. Despite this transition process, which is based on the establishment of the institutional functioning of development cooperation to reduce fragmentation, increase efficiency of cooperation and share of GNI; ODA is subjected to criticism not only from the OECD, but also NGOs in particular because of low efficiency and promotion of national (security, economic and political) interests of the necessity criterion. The total volume of Czech aid is still inadequate because the government does not represent any major budgetary priority. (Machálková, 2009)

Current development, however, shows that the Czech Republic, like other European Union countries (with the exception of donors, whose assistance exceeded 0.7 percent of GNI), tend to the second scenario - a steady decline in development assistance on the background of the two-speed Europe, not only from economic and political perspective, but also in terms of providing assistance to developing countries.

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FORWARD RATE AS UNBIASED PREDICTOR OF THE FUTURE SPOT EXCHANGE RATE

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Abstract. This article deals with statistical testing of interest rates parity. It means the way how interest rate differential influences the spot exchange rate. The main analysis is made by processing the Czech economy data. Described problems are being solved in many studies all over the world. The main task is to answer the problematic question about the exchange rate asset in a form, as if it is able for this market to be supposed as an efficient market (efficient market hypothesis confirmation). Practically in broker management of financial assets it is assumed that the market itself is not efficient so that by simple repeating trading rules we can achieve arbitrary riskless profit. Usually there is the efficient market hypothesis rejected. It also means that we cannot accept the market to be inefficient (statistical second type error). In this contribution there are presented alternative views to unbiased prediction ability of forward rate and general trends in the statistical testing of interest rate parity conditions.

Keywords: interest rate parity, efficient market hypothesis, forward rate, unbiased predictor.

JEL Classification: E37, E47.

1. Introduction

This contribution deals with both theoretical interpretation of fundamentals for exchange rate factors and practical econometrical analysis of the exchange rate CZK/EUR evolution for the last ten years. According to Fama´s formula the forward rate in particular time serves as unbiased predictor for the expected spot exchange rate in time of the forward rate maturity (Fama, 1976). In this contribution we are analyzing the way in which there is the relation between the forward rate and the future maturity spot exchange rate observed in dataset of the CZK/EUR exchange rate and the 3M forward rate (3M means three months maturity of forward rate) of this contract.

The main task in this article is to answer the problematic question about the exchange rate asset in a form, as if it is able for this market to be supposed as an efficient market (efficient market hypothesis confirmation).

2. Theoretic background

As if the market for any financial asset is supposed to be efficient, anyone could not expected long term regular riskless abnormal profits from simple speculation with this financial asset. Moreover it is implicitly assumed that there is no asymmetric information, so that all the market participants are using the perfect information. Additional main assumptions are the rational expectation assumption and the risk neutral relation to risk itself for any market participant on the financial asset market.

Then it is rational for any market participant (able to optimize) to compare expected rate of return in the domestic currency and alternatively in the foreign currency. Alternative yields are calculated due to different interest rate in the foreign economy.

The philosophy described in the previous paragraph is the basic element in the exchange rate determination theory. This approach is called the interest rate parity and is additionally reformulated in two ways – the covered and uncovered form.

The uncovered interest rate parity is described according to formula (1). This formula assumes the equal value between the expected change in the exchange rate and the domestic interest rate and foreign interest rate to financial assets differentiated just with the country of issue bet with the other factors they these financial assets are identical.

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$$\Delta_k s_{t+k}^e = i_t^d - i_t^f \tag{1}$$

In the interest rate parity condition (1) s_t means the natural logarithm, t represents time, i_t represents the domestic (foreign) interest rate, k is the time to maturity and e represents the market expectation in time t. The covered interest rate parity expand the philosophy with the idea of the equal value of the expected forward discount (forward premium) and the difference between the domestic interest rate and the foreign interest rate to identical financial asset.

3. Prediction ability of forward rate to foresee the future spot exchange rate

After integration the uncovered and interest rate parity together we gain the solution for the practical empirical econometrical testing the forward rate as unbiased predictor for future spot exchange rate. This solution is described in the formula (2).

$$F_t^{(k)} = E_t(S_{t+k}) \tag{2}$$

The idea in the formula (2) is being tested in many serious researches in the form of regression or just the testing the data difference between forward rate and relevant spot rates in future to follow the orthogonality condition. The formula (2) is always being rejected, even in the "weak" version market efficiency.

Practically it is impossible to exclude the transaction costs, which leads to anytime deviations from the formula (2). There is "a neutral band" supposed which should be stable in time. For instance Frenkel and Levinch (1977) have made observations that almost 80 % of profit contracts with treasury bonds are lying in this band. Moreover when we assume ECB rates we gain the solution that 100 % profit contracts are lying in this „neutral band". Frenkel and Levinch (1976) state that during the times of financial instabilities profit contracts for basic currencies are going outside this neutral band. In the other words the deviations from formula (2) are impossible to be explained with the existence of transaction costs. These ideas are further analyzed in Froot and Frankel (1989).

Taylor (1987) assumes the "maturity effect", which shows positive dependence between the time to maturity of financial asset and the deviation from the formula (2) (profit opportunities according to the interest rate parity condition which is being rejected).

4. Other approaches to interest rate parity conditions – regression analysis

In this approach authors are always solving the regression formula shown in the formula (3).

$$f_t^{(k)} - s_t = \alpha + \beta \times (i_t^D - i_t^F) + \mu_t \tag{3}$$

Where α, β represent regression parameters and μ_t represents residuals. Practically in most important studies there is not α parameter estimation a null value, which represents the existence of transaction costs. Moreover the parameter β estimation is statistically significant from the value of one. These results are not confirming the theory of interest rates parity for exchange rate determination.

When the parameter β estimation is a minus one value, then appears a situation called "forward discount bias" which means in the other words that for instance forward premium influence the future spot exchange rate inverse than the theory would expected. Anyway the more is currency sold with the forward premium, the more this currency will be depreciating in contrary with expected appreciating.

Results of many exchange rate studies concluded that either the efficiency market hypothesis is rejected (orthogonality rejection for the residuals) or the covered interest rate parity is rejected (according to the regression analysis). In the other word it means that it is possible to achieve a long run regular riskless abnormal profit for many market participants.

5. Rethinking efficiency – risk premium

In general there are two main reasons for the market efficiency rejection on real dada either the assumption of risk neutral preferences or the pure rational expectation assumption. For the first reason we need to modify basic formula for interest rate parity according to equation (4).

$$\Delta_k s_{t+k}^e + \rho_t = i_t^d - i_t^f \tag{4}$$

Market participants then calculate risk premium ρ_t as a satisfaction (abnormal return) for risky financial foreign exchange asset. Moreover forward premium (discount) is divided into the expected depreciation (appreciation) and the risk premium (5).

$$f_t^{(k)} - s_t = \Delta_k s_{t+k}^e + \rho_t \tag{5}$$

Sarno and Taylor (2006) explain the risk premium as a part of Lucas model. This model is DSGE model for two economies. Market participant are endowed with the same preferences, but with different stochastic distribution of goods for consumption between these two economies. Finally conclusions of Lucas model are that it is not so suitable to explain abnormal profit of foreign exchange market with the risk premium. In order to be able to confirm the risk premium model we need to take into account very high coefficient of risk averse or conditional covariance between spot rate and consumption has to be very high. Moreover in the developed countries the consumptions is stable in time in comparison with very volatile exchange rate, so that covariance between these two variables is really low. Pošta (2012) is interested in the estimation of the time varying risk premium as crucial factor of the equation difference.

6. Rethinking efficiency – speculative bubbles in the financial markets

As we have assumed the risk neutral preference to risk for market participants, market bubbles are then able to be supposed as a reason for long run riskless abnormal profits. Investors are expecting the rise in market even though the current price is above its equilibrium. In the other words they are expecting additional blow in the bubble. According to these factors the psychology financial theories have appeared.

$$s_t = \lambda E_t s_{t+1} + v_t \tag{6}$$

The equation number 6 explains the current exchange rate as dependent variable on the future expected exchange rate (discounted with lambda) and on the other economic factors known v_t. This equation is simple forward looking differential equation with the solution in form (there are many others solutions).

$$_t = \sum_{i=0}^{\infty} \lambda^i E_t v_{t+i} \tag{7}$$
$$s_t = {}_t + B_t \tag{8}$$

$$B_t = \lambda E_t B_{t+1} \tag{9}$$

B_t is the reason for "blow" into the bubble of the foreign exchange asset (exchange rate). Investors are making their decision under the risk of blow or burst the speculative bubble. The probability distribution is asymmetrical and is able to be described as following.

$$B_t = (\pi\lambda)^{-1}B_{t-1}, \text{ with probability: } \pi \tag{10}$$

$$B_t = 0, \text{ with probability: } 1\text{-}\pi \tag{11}$$

The distinct is skewness in this distribution, so that the deviations from the parity conditions are expected. In order to introduce complex view of this chapter we should discuss moreover "*peso problem*" "*asymmetric information*" and "*learning by doing problem*". Due to shortage in space in article we would advise anyone to study Sarno and Taylor (2006) from further references. There are many dissent views of modeling in macroeconomy; for instance these approaches are described in Colander (2006).

7. Empirical part – the evolution in the EUR/CZK foreign exchange rate

The basic dataset consist of the time series of the forward rate points and the spot exchange rate time series. These data are able to be downloaded on the Czech National Bank web pages (CNB, 2012).

For the risk premium analysis we have gained the time series from 2.5. 2001 t 8.11.2011, that is 2654 observations. In order to achieve statistical excellence we have transformed these data in the month averages (finally 126 month averages). The forward contract is of type 3M, which means that forward contract has the three months maturity. The data structure is presented in the following graph. Forward rate points are divided by hundred and then sum up with the current exchange rate in order to gain the forward rate F_k. This analysis follows Liu and Maddala (1992).

Table 1. The Data Evolution.

Date	Exchange rate	maturity	Forward rate points	S_k	F_k
02.05.2001	EUR/CZK	3M	7,95	34,545	34,55295
03.05.2001	EUR/CZK	3M	7,9	34,6	34,6079
04.05.2001	EUR/CZK	3M	4,45	34,645	34,64945
07.05.2001	EUR/CZK	3M	6,55	34,63	34,63655
09.05.2001	EUR/CZK	3M	4,6	34,625	34,6296
10.05.2001	EUR/CZK	3M	8,2	34,455	34,4632
11.05.2001	EUR/CZK	3M	25,75	34,4	34,42575
…	…	…	…	…	…
…	…	…	…	…	…
…	…	…	…	…	…
01.11.2011	EUR/CZK	3M	-36,47	25,035	24,99853
02.11.2011	EUR/CZK	3M	-37,07	25,15	25,11293
03.11.2011	EUR/CZK	3M	-35,03	24,915	24,87997
04.11.2011	EUR/CZK	3M	-33,1	24,995	24,9619
07.11.2011	EUR/CZK	3M	-31,5	24,995	24,9635
08.11.2011	EUR/CZK	3M	-33,46	25,175	25,14154
09.11.2011	EUR/CZK	3M	-30,24	25,44	25,40976

Source: author work based on the CNB (2012).

The basic hypothesis is deducted from the equation:

$$s_{t+1} = f_{t+1} + \varepsilon_{t+1} \tag{12}$$

$$H_0: \varepsilon_{t+1} = 0 \tag{13}$$

The purpose in this work is to confirm or reject the orthogonality of ε_{t+1}. In the other words the forward rate in presence is in average identical as expect spot exchange rate in the future in the time of maturity. The Efficiency market hypothesis is the joint hypothesis. Moreover we assume and test the stationarity of the residuals time series (stable mean value and limited variance). According to figure of times series we make conclusion that the forward rate evolution is followed with the spot exchange rate. But as we will see further statistically it is not so simple.
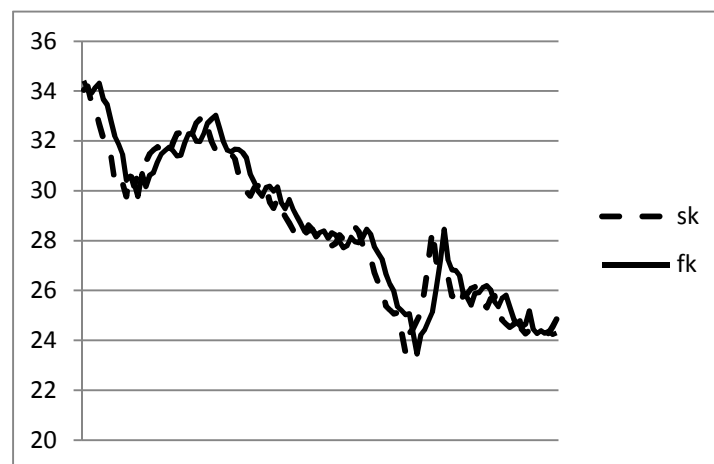

Fig. 1. Graphical analysis (Source: author).

Nevertheless as visible in the previous figure increases are followed with other increases and decreases are followed with other decreases. These time series need to be tested for stationarity. The most famous test for this characteristic of time series is the Augmented Dickey Fuller statistical test (ADF test). Null hypothesis H_0 is about the non-stationarity of time series. For forward rate time series the p-value is calculated on the value of 0.5577. It means that the null hypothesis is not allowed to be rejected on 5 % statistical significance. Or in other words H_0 about non-stationarity could be rejected on the 55.77 % statistical significance.

The spot exchange rate time series is by the test evaluated on the p-value 0.5625 so that again the null hypothesis is not able to be rejected for the spot exchange rate as well. Both time series are non-stationary, but the common equilibrium might be stationary or even orthogonal (stationary on the null value)

When we use regression analysis we do observe the spurious regression because of autocorrelation (Durbin Watson statistics is of value 0.4653). This statement is confirmed with the values of autocorrelation function (ACF) or with partial correlation function (PACF). Autocorrelation is significant to *t-3* lagged observations as it is viewed on the following figure.

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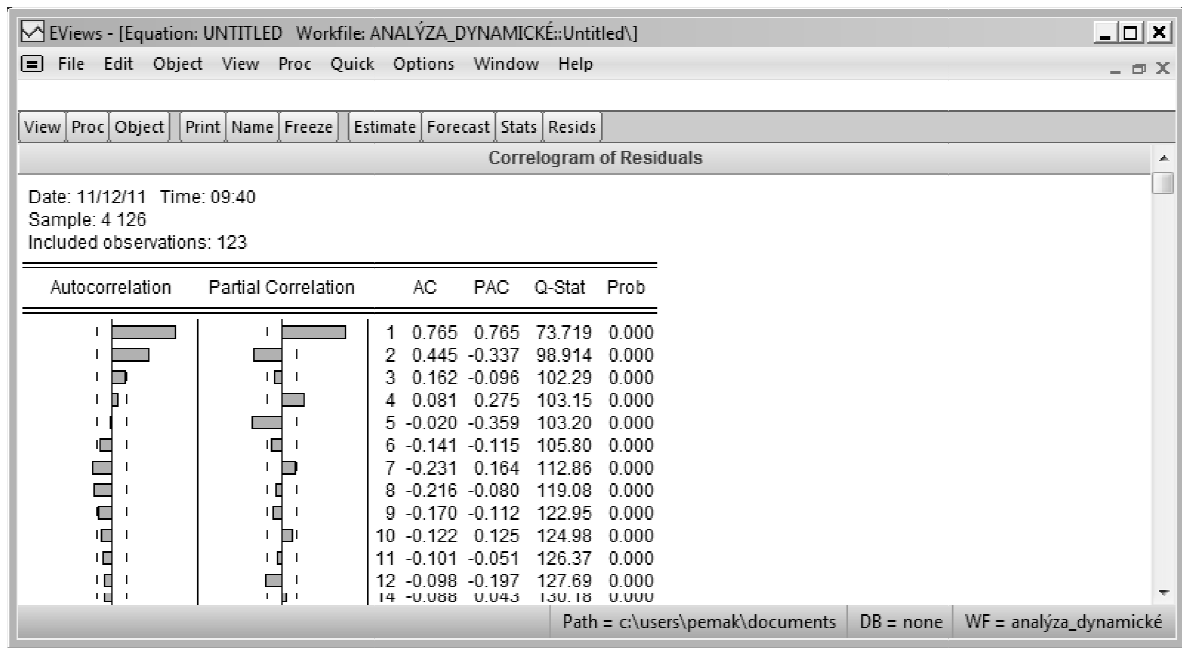
Fig. 2. ACF and ACF (Source: author in E-views).

Moreover it is visible that the residuals themselves do not follow the normal probabilistic distribution as it is shown in the Fig. 3. The null hypothesis about normality is rejected on any low value of statistical significance.

Fig. 3. Jarque-Bera test of normality (Source: author in E-views).

Moreover the heteroscedasticity test (Breusch-Pagan-Godfrey) rejects the homoscedasticity (p-values are lower than 0.05). It is also visible in the Fig. 4. Autocorrelation, non-normality and heterescedasticity of residuals are reasons for inaptitude of created regression equation. It is just spurious regression.

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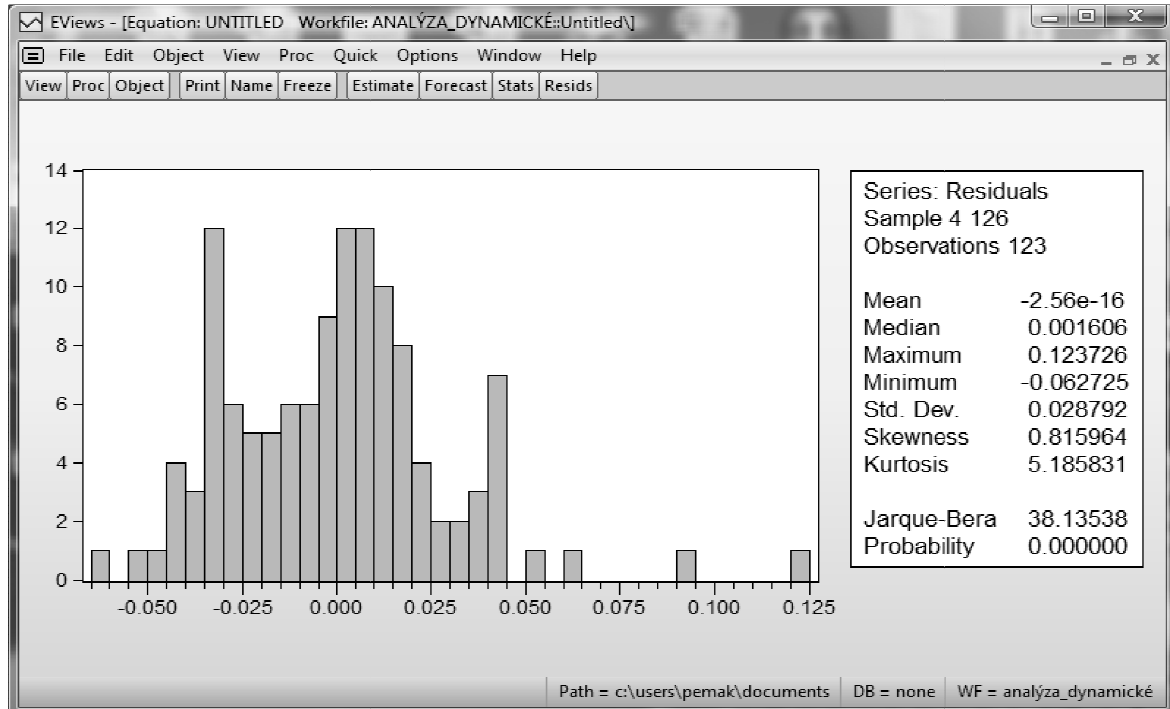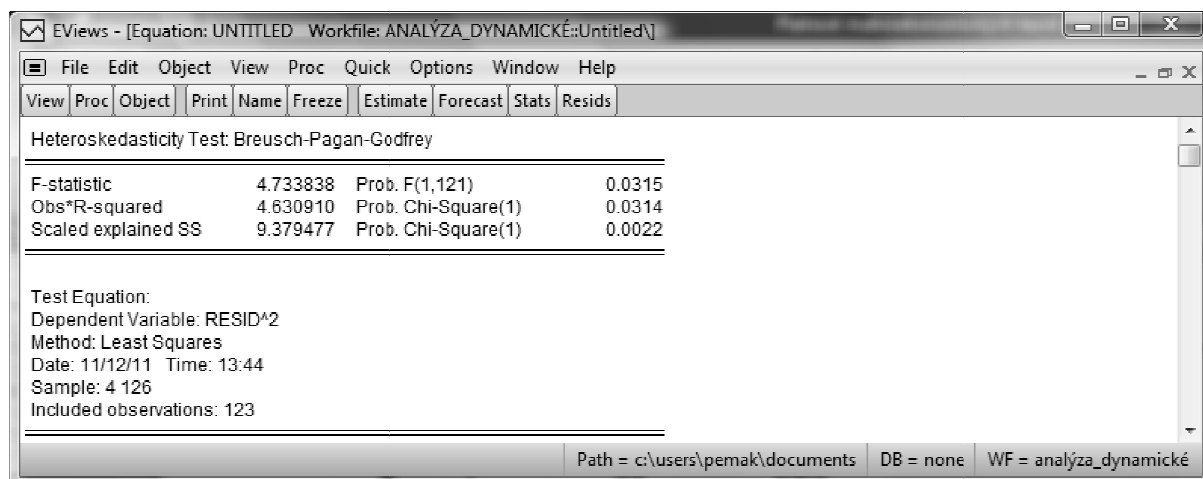Administration in Karvina, 2013

Fig. 4. Jarque-Bera test of normality (Source: author in E-views).

In order to answer the main task of this work we need to test the stationarity for the time series of differences between forward rate (*t-3* lagged) and the spot exchange rate. As we have said before both the forward rate time series and spot exchange rate time series are non-stationary (according to ADF test).

The analysis will be made simple as before. The null hypothesis about non-stationarity is tested on the time series of differences with ADF test. The results are shown in the Fig. 5. The null hypothesis about non/stationarity is rejected on the 5 % statistical significance. Moreover according to p/value it could be rejected on the 2 % statistical significance. The difference time series is stationary as it is shown in the Fig. 6.

The heteroscedasticity statistical test is analyzing the null hypothesis H_0 that the differences in the parity conditions follow the stochastic process called martingale. This means that there is a stable mean value but unlimited variance. According to joint hypothesis we deduce that on 18,16 % statistical significance we can reject the null hypothesis that the time series is a martingale process. According to the level of "martingality" we can expect option for long run riskless abnormal profits in the market for the foreign exchange asset and rejection the efficiency market hypothesis.
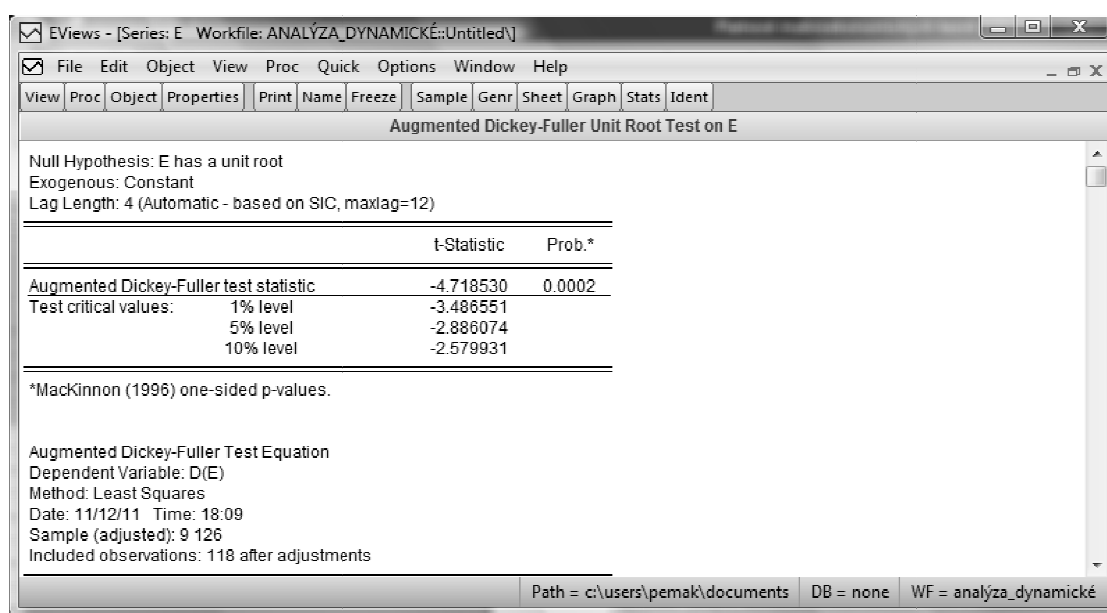
Fig. 5. Market efficiency of foreign Exchange financial asset test (Source: author in E-views).
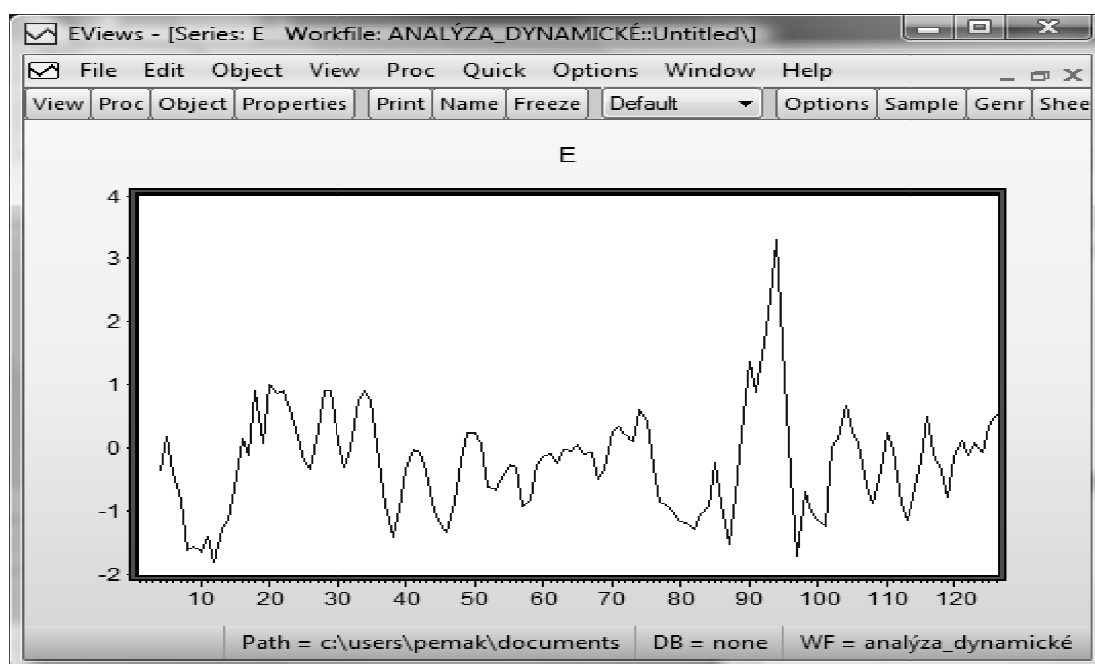
Fig. 6. Time series of differences in parity conditions (Source: author in E-views).
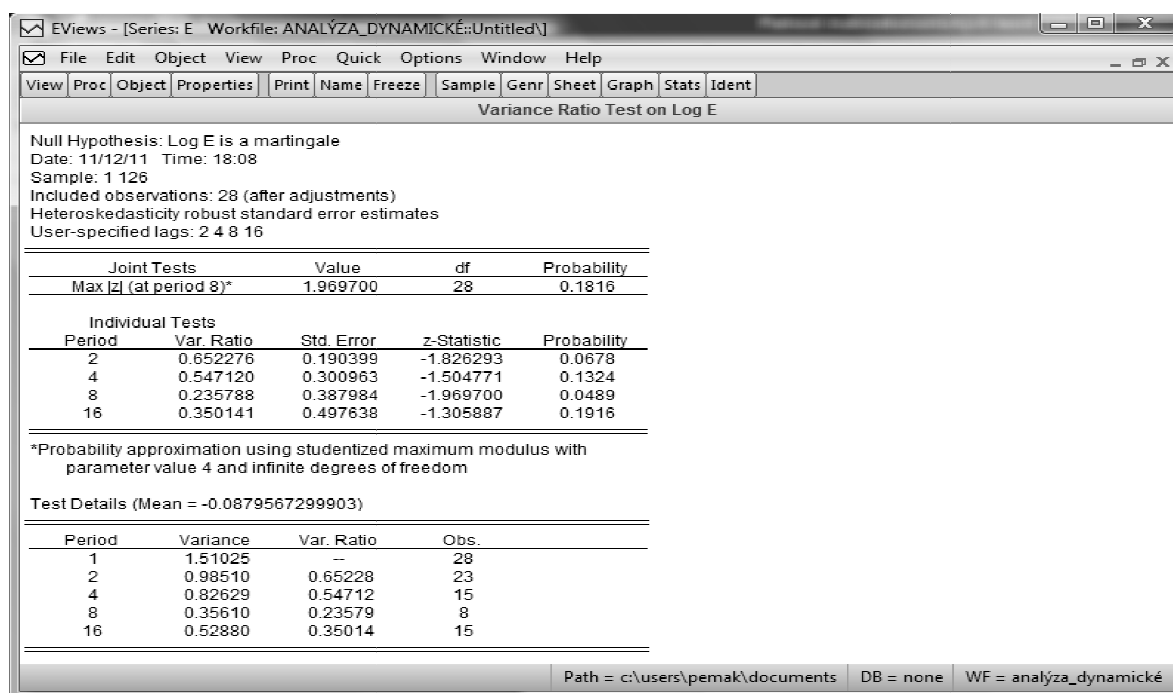
Fig. 7. Martingale test in the parity conditions (Source: author in E-views).

8. Conclusion

The main task in this article is to answer the problematic question about the exchange rate asset in a form, as if it is able for this market to be supposed as an efficient market (efficient market hypothesis confirmation). In the theoretical part we have shown recent approaches to the fundamentals of the exchange rates in the form of parity conditions of interest rates and the joint hypothesis of the market efficiency in the foreign exchange financial assets.

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We have tested the weak form of the market efficiency hypothesis which was rejected on the real data. The differences supposed to be orthogonal have the stable null mean but data provide unlimited increasing variance. In the other words the stochastic process provides the martingale behavior.

In the part of regression analysis we have tested normality, autocorrelation and heteroscedasticity of residuals in the regression model. All these factors have been confirmed in the model so that the regression itself is just spurious regression which would have been eliminated with autoregression parameters and the GARCH method.

Finally we have to make statement that trading according simple stable methods we can achieve riskless long run abnormal profits on the level of statistical significance of 5 % (martingale behavior). But with 18 % statistical significance the null hypothesis is rejected and stochastic process has stable variance so that there would have been no space for abnormal profits in the foreign exchange market CZK/EUR.

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THE EUROPEAN UNION'S COMMON AGRICULTURAL POLICY AND FOOD SECURITY

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Abstract. The aim of the publication is to present the evolution of the EU's agricultural policy and to indicate the role of food security as one of the most important its determinants. The need to maintain food security has many reasons, including especially the development of globalization. A particularly important factor, tightly coupled with the concept of food security, is the issue of quality and health of food products. The escalation of the problem of food contamination and its counterfeiting make the European Union members' cooperation under the RASFF very important. It is a tool for information exchange within the Community and for elimination of sources of risks to human health, associated with consumption of hazardous products. In the context of changes in the world economy, intensification of global phenomena and increasing challenges for humanity, the role of CAP appears to be significant not only for the development of agriculture and rural areas, but also for maintaining food security.

Keywords: European Union, Common Agricultural Policy, food security, globalization.

JEL Classification: Q18, O13.

1. Introduction

The ongoing process of globalization and the challenges connected with it, as well as the consequences of the economic crisis started in late 2007, the accession of ten countries to the European Union in 2004 and the perspective of further integration, caused that the necessity of reforming the Common Agricultural Policy (CAP) has become particularly important and yet difficult in implementation. Although certain simplifications in its operation (in the sphere of legislation and reducing administrative burden) have already been applied, and it has contributed to greater transparency and savings in administrative costs, it is still a special and extensive area of cooperation, which requires concentrating attention not only on the situation within the European Union, but also outside it.

In debates on the future shape of the EU's agricultural policy, the concept of food security seems to have gained special significance. This issue is located in the main directory of the CAP's objectives given in the Treaty of Rome, but in a slightly narrower context, referring primarily to assuring supply of agricultural products and to ensuring that consumers can buy food at „reasonable" prices. The lack of specific reference to the quality and wholesomeness of the products, under the circumstances of rapidly growing international trade in food and growing importance of transnational companies in the supplies (often over long distances), as well as the extension of distribution channels due to the increased number of intermediaries, caused that defective products, and even dangerous to human health, have begun to appear on the food market, which is more and more anonymous. Moreover, current EU's agricultural policy is accused of having no prioritization of objectives, which in the context of challenges posed by globalization and existing conflicts among the various targets of the CAP, makes it opaque and chaotic (Chmielewska-Gill et al., 2011).

The purpose of the paper is to present the evolution of the EU's agricultural policy with particular emphasis on the growing role of maintaining food security. The author, besides the characteristics of the concept of food security, pays special attention to one of its determinants – the quality and health aspects of food. In addition, major causes of instability of food security in the modern global economy are indicated. When preparing the paper, a descriptive method and the analysis of literature were used as research methods.

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2. The evolution of the Common Agricultural Policy

The Common Agricultural Policy is one of the oldest policies of the EU member states. A long period of its functioning, subsequent enlargements of the Community and trends in the global economy caused that in recent years it has been a subject to many changes, in order to adapt it in the best way to the reality and to meet the expectations of its beneficiaries and members of the World Trade Organization.

The objectives of the European Union's Common Agricultural Policy were established in the Treaty of Rome and are as follows:
- to increase the efficiency of agricultural production by promoting technical progress,
- to ensure a fair living standard for rural society, in particular by increasing the earnings of farmers,
- to stabilise markets,
- to assure the supply of agricultural products,
- to ensure that consumers can buy food at „reasonable" prices (EU, 2006, art. 33).

A relatively long period of existence of the Common Agricultural Policy can be divided into several stages. The first period is the years 1958-1962. At that time, the focus was made on identifying the mechanisms of agricultural support, according to the principles of agricultural policy, constituted in the Treaty. In the years of 1962-1968, the major principles of operation of agricultural markets were worked out and prices of most agricultural products were brought to one level. Basic legislative acts regulating the agricultural policy were adopted and the European Agricultural Guidance and Guarantee Fund was established. The next stage of the policy concerned the years of 1968-1975. Then, the problems of excessive expenditure to finance agriculture and of overproduction intensified. Also an unsuccessful reform of the CAP, based on a so-called Mansholt plan, was conducted. In addition, the principles of agricultural products exchange within the Community were regulated and the legislation, concerning the application of import duties, was adopted (Szumski, 2007).

The next decade of the CAP (i. e. the years of 1975-1985) highlighted an additional problem of agriculture, connected with the necessity of environment protection. In the years of 1985-1992 much legislative work was started, related to further modification of agricultural policy instruments. The price support was reduced and structural instruments were at the same time implemented (including, among others, the exclusion of arable land from farming and agricultural production extensification). However, these and other solutions did not balance negative effects of agricultural support in preceding years. Producers still generated the supply surplus. One of many reasons for inability to hamper the production at decreasing prices seemed still favourable financial conditions of maintaining or even enlarging the scale of the activity. Additionally, high fixed costs in connection with difficulties in diversification or reorientation meant that the scale of production was not decreasing (Wysokińska and Witkowska, 2004; Szumski, 2007).

In the process of the CAP evolution, the year 1992 should be highlighted, when assumptions of a new reform, so-called MacSharry's one, were accepted. It consisted of the introduction of direct payments in exchange for a reduction in guaranteed prices for basic agricultural products and of the exclusion of some land from production. Moreover, so-called accompanying measures began to be used, and their purpose was to support the activities of entities linked not directly to food production. These included: aid for environment protection, afforestation, early retirement (Dugiel, 2007). An important part of the ongoing changes in the perception of the agricultural policy constituted growing awareness of the necessity of ensuring food security associated with pro-ecological activities. The next phase in the policy, covering the years of 1992-1999, concerned the implementation of major provisions established in the MacSharry's reform. Introduced changes brought positive results in terms of reducing stocks of agricultural products and decreasing production costs. At the same time, the EU budget expenses to finance the CAP increased. During next four years of the CAP (i. e.

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1999-2003) the provisions of a document called Agenda 2000 were adopted. It was the continuation and deepening of the MacSharry's reform principles (i. e. among others concerning a reduction in the intensity of agricultural production, pro-ecological activities, support of farmers' income with direct payments, awarding compensation payments for producers in less favoured areas). Moreover, a support was granted to countries on the threshold of membership for adapting their agriculture to the EU's requirements. Thus, the modification of the agricultural policy consisted in moving from income aid for producers, through supporting the production, to backing of the income from non-productive activities and of living conditions in rural areas (Szumski, 2007).

The next stage of reconstruction of European agricultural policy was launched in 2003 under the name of so-called Luxembourg reforms. It was the continuation of the trends outlined earlier. The first pillar of the CAP (market and price support policy) was modified and the second one, i. e. structural policy, was clearly separated and strengthened. Another solution to rural development support became the adoption of so-called modulation, based on a partial transfer of funds for direct payments (intended for the largest farms), from the first to the second pillar of agricultural policy. In addition, the single payment scheme system was implemented in the 15 "old" countries of the EU, which was to separate financial support from production volume. New member states adopted a simplified system of direct payments in the form of Single Area Payment Scheme. Moreover, the payments were connected with the necessity of fulfilling by holdings conditions included in the so-called cross-compliance rule. Among others, they concern environmental regulations, food safety, preservation of animal welfare, plant health and safety at work (Adamowicz, 2012).

Of particular importance for the CAP's new programming period (2014-2020) has become a review of European agricultural policy (so-called "Health Check"), launched in late 2007. During it, previous actions have been assessed and new solutions have been implemented for the following years. The focus has been made primarily on the reduction of market intervention and on the maintaining the payments' system, and separating them from the volume of production (with some exceptions) at the same time and sustaining the principles of modulation (favouring deeper development of rural areas). Some actions have been started towards better and fairer distribution of the direct payments among member states.

In addition, particular attention has been paid to the challenges of a global range, such as changing climate, increased demand for biofuels, the need for rational use of natural resources, protection of biodiversity (Tereszczuk, 2008). Simultaneously, together with these phenomena, and also under the influence of others, the problem of ensuring food security has appeared, which in the face of diminishing natural resources and the need for sustainable methods of using rural areas has become a difficult endeavour to achieve.

In conclusion, one can say that the Common Agricultural Policy conducted in the 70s and 80s of the twentieth century, was mainly based on the use of interventionism and protectionism. In addition, it isolated significantly the internal market from international competition, supporting manufacturers' and farmers' income. However, the increase of production efficiency and effective protection of the internal market, together with the recorded decrease in the rate of population growth in the common market, in a short time contributed to overproduction of food. An additional problem has become an increase in spending on CAP and the necessity to support and direct rural development (Walkowski, 2007).

Although the need of the agricultural policy reform was recognized in fact in the late 60s, only in the early 90s the significant changes in the organization of the common agricultural market occurred, by replacing the dominant role of the prices system with the direct payments system. At the same time, more and more sophisticated instruments of structural policy, ensuring multifunctional, sustainable and competitive development of rural areas, gained importance (Borowiec and Wilk, 2005).

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Subsequent CAP modifications has led, among others, to decoupling payments from production, which was to direct agriculture to the market. In addition, direct financial support for holdings was linked to the compliance with environmental requirements, safety at work, health standards, animal welfare and food quality and safety.

Therefore, after fifty years functioning, European agricultural policy can be considered as improving the quality of life of rural population, leading to increased productivity and ensuring the supply (FAPA, 2011). The problem of food security has gained particular significance in recent years. The crisis of 2007-2008, disturbance of the equilibrium in the agricultural markets, rising food prices and the challenges associated with globalization have caused that the access to the agri-food products, both in Europe and at global scale, has become a matter of attention of many scientists and entrepreneurs.

Despite the fact that the EU citizens do not have any problems with the access to sufficient food, there is a group of more than 40 million poor people in the Community experiencing food shortage. In addition, the public awareness of food safety has increased, and the quality of food plays a particular role in it. In the world, the phenomenon of food shortage is much larger and affects more than 1 billion people (Science Daily, 2009; FAPA, 2011). Thus, the problem of ensuring access to these products is both global and regional.

In front of the European Union member states, which have abilities to increased food production, the challenges linked closely to food security (having broader context than food safety) arise. They concern, among others, rising energy prices, the need of reducing carbon dioxide in the atmosphere, the necessity of sustainable agricultural development in the context of progressive degradation of the environment and finishing natural resources, unstable climate and promoting extensive farming methods. Because of projected population growth in the world and increasing demand for food (also as a result of the improvement of society's wealth in many countries, especially in China), the EU's agriculture will have to cope with increased food production while using efficiently land, water and energy (FAPA, 2011).

3. The concept of food security during recent decades

The concept of food security is a complex issue and can be considered in a multi-threaded way. This is because of its connection, among others, with economic, ecological, social and energetic aspects. Moreover, it can be seen at several levels, i. e. of household, country, integrational grouping and world (internationally). The latter gains special importance in the context of globalization. When equating this phenomenon with technological and technology progress, one can consider that it has contributed to an increase in food production, whose current amount is sufficient to cover the needs of the whole population of the world. But still more than 1 billion people in most developing countries are starving (Science Daily, 2009).

Among many definitions of the concept of food security, particularly noteworthy is the one formulated by two American sociologists, Bush and Lacey (1984), who claim that food security has at least three dimensions:
- availability – having enough food to sustain human life in the entire population at any time,
- accessibility – food supply should not be limited by the effective demand,
- adequacy – which can be understood in the category of a balanced food ration, but also free from diseases and toxic substances.

Over past few years, the concept of food security has evolved, which has been associated with changes in the approach to this problem and in stressing its key aspects. The beginning of the seventies of the twentieth century is considered as a particularly important moment in spreading discussions about food security issues at international meetings. It was when the food crisis appeared and affected many countries.

The first official interpretation of the concept of food security was made at the World Food Conference in 1974, organized by FAO. It was acknowledged then that the concept of food security refers primarily to the supply side of food market. This approach emphasized the necessity of ensuring at any time the availability of basic food products, at both national and international levels, in order to meet the continued growth of consumption and to prevent fluctuations in production and prices (Kowalczyk, 2009; Sapa, 2012; FAO, 2012a).

Another, slightly modified definition of food security was presented in 1983. At that time, beside physical availability of food, the aspect of its economic accessibility was indicated. Expanded interpretation of food security was adopted during the World Food Summit in Rome in 1996, where in addition to the two mentioned conditions (which are quantitative), a qualitative dimension was introduced. It concerns such elements as food safety, individual food preferences and treating food as a base of active and healthy life. It is worth noting the difference between food security and food safety. The first category has a broader context and includes among others food safety, which refers primarily to health and nutritional value (Kowalczyk, 2009; FAO, 2012b).

Next World Food Summit was held five years later and played a role in the evolution of approach to food security. It is worth pointing out that in 2004 also so-called "Voluntary guidelines to support the progressive realization of the right to adequate food in the context of national food security" were adopted by the FAO. Among many issues contained in this document, the ninth directive on food safety and consumer protection deserves special attention. It refers, among others, to the necessity of building food control systems in the whole food chain, including the stage of feeding animals, and the need of creating standards for food quality and its health safety, which together with specific remedial actions should not constitute a barrier in international trade (Kowalczyk, 2009; FAO, 2005).

At the next summit, held in November 2009, FAO member states – in the context of deteriorating food situation in the world, which had been a consequence of maintaining high food prices and climate change problems – unanimously decided to eliminate widespread phenomena of hunger as soon as possible. It was agreed to increase the aid to agriculture in developing countries – in such way that starving population of over one billion people could gradually become independent with regard to food supply (USA Today, 2009).

The approach of the European Union's agricultural policy to food security has also evolved. According to the treaty provisions, it had related to guaranteeing food supply at affordable prices. But because of quite quickly solved problem with food shortage in European market, ensuring food supply seemed to have lost its strategic nature for many years. However, increasing globalization has made food supply security, prices and quality an area of wider interest of the EU authorities (and not only of them). Progressive growth of international interdependence and intensification of international trade with quite important contribution of transnational companies, caused that purchased food has become partly anonymous and took features of mass consumer goods (Kowalczyk, 2009). In turn, it has become a factor contributing to the introduction of food of questionable nutritional and health value. Therefore, countries have focused on development and implementation of quality standards for food production. Moreover, noticeable differences in the cost of food production and the tendency to reduce the barriers in international trade have encouraged countries to abandon their own, more expensive production and to buy abroad. Consequently, excessive imports, combined with variable and hardly predictable weather conditions in the producer countries destabilised conditions of food supply (Malchar-Michalska, 2011).

It is also worth noting that although theoretically the elimination of trade barriers allows all participants of the global economy to develop the production and to deliver goods, in practice liberalized trade removes many producers from the market, especially local food manufacturers, who are not able to face increasing competition (and afford, for example, expenses on environmental protection and maintaining organic nature of the product). International corporations are largely responsible for this situation. They build their dominance basing on mergers and acquisitions, which

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are partly an inevitable consequence of the ongoing global crisis, started in late 2007 and early 2008 (Kozmana, 2011). Moreover, together with development of food production on a large scale, use of global advertising, which often encourages to uniform consumption, and pressure to reducing production costs (which manifests, among others, in using genetically modified components of not fully explored impact on human health), the problems of food counterfeiting (which is not a new phenomenon, it has to be said) and unfair trade practices have appeared. It should also be emphasized that the incredible complexity of the problem of food security was revealed in 2007-2008 by the world food crisis, which manifested in the rapid growth of prices. It forced to deal with this issue again (previously, a sharp price rise was reported in 1972-1974).

Thus, the issue of food security has become so extremely important that during the discussion on the CAP's future, European Parliament in the Resolution of 18 January 2011 decided to recognize agriculture as a strategic sector in the context of preserving food security (FAPA, 2011; European Parliament, 2011a). Furthermore, in another Resolution adopted by the Parliament on 23 June of the same year (European Parliament, 2011b), the problem of food security was, among others, highlighted – as a challenge not only for the EU member states, but also for other countries. This is related to the earlier mentioned population growth, increased demand for food (reported not only because of the rising number of people in the world, but also due to the rapid economic growth of many developing countries resulting in improved society's wealth) and escalating pressure to the utilization of natural resources. The key to cope with these and other challenges is a stable and competitive EU's agricultural sector, with the assigned function of, among others, maintaining agricultural activity in rural areas, preventing their depopulation, preserving production potential, implementation of environmentally sustainable production methods and providing safe food products of high quality (Wigier, 2011).

It is also worth noting that the implementation of food policy in the context of maintaining the EU's food security is difficult because it creates a certain contradiction in the simultaneous fulfilment of three conditions regarding physical availability, economic accessibility and health benefits of food. On one hand, food security (understood in terms of accessibility and availability) is achieved through industrialization of agriculture and intensification of production and breeding, on the other hand, these processes lead to lower nutritional and health value of consumed products (FAPA, 2011).

4. Threats to maintaining food security

Among many determinants that affect food security destabilization, one can identify mainly: demographic problems, limited access to arable land, climate change, water scarcity and droughts, loss of biodiversity, or limited access to energy and an increase in its prices.

When it comes to demographic problems, particularly noteworthy is continuous positive growth of population in the world (mainly in developing countries, such as China and India) (United Nations, 2012). The demographic situation of Europe looks different. Predictions concern a reduction in residents by about 81 millions until 2045 (FAPA, 2011). Continuous progress in medicine definitely extended human life, also contributing to increasing population. The intensive migration is another important phenomena, which affects consumption patterns – their modification and creation. Spreading of urban lifestyle has been one of the factors influencing significantly the changes in the consumption model. This lifestyle is connected with purchasing partially and highly processed food, which, besides having energetic properties, performs many additional functions, largely related to healing. Transnational corporations encourage to the purchase of this kind of food with the global advertisement which rapidly reaches a wide range of consumers. Another important factor, affecting nutritional needs, is the speedy growth of many developing countries, which raises the standards of living, and among others, results in an increase of meat consumption (FAO, 2012b). Animal

husbandry is in turn closely linked to the consumption of fodder grain, thus puts increasing pressure on widening the arable land.

Growing competition for the agricultural area is another important issue. It is a result of rising demand for food, which is attempted to satisfy partly with the improvement of used growing techniques' efficiency. However, more intensive use of land raises the risk of soil degradation and thus reducing the available arable land (FAPA, 2011). The deterioration of soil results from its inappropriate treatment by people: defective irrigation practises leading to salinity, drainage resulting in hyper drying, intensive grazing, large-scale deforestation or monocultural cultivation worsening soil quality. It is worth noting that progressive urbanization also has an impact on reducing the arable land, which is attempted to increase in an unconventional way – through constructing so-called vertical farms in urban areas. But the prospect of this technique of growing food seems to be still very distant (FAPA, 2011). In addition to the exclusion of land from cultivation because of the above-mentioned reasons, the limitation of agricultural production is also influenced by purchases of entities operating outside the agri-food sector. Among them, of special importance are fuel and energy companies which use agricultural goods in the production of so-called biofuels. Of course, this causes many effects to agriculture. On one hand, among others it has gained importance in the supply of renewable energy (which is desirable from an environmental perspective and in order to become independent from fossil fuels), which helps to increase the level of employment, on the other hand, the competition for the arable land between the food and non-food purposes, has intensified (Zegar, 2007). In order to eliminate this negative competition, it seems reasonable to support the supply of second-generation fuel, i. e. derived from non-food agricultural commodities. One should also pay attention to the society's growing awareness of the progressive degradation of the environment and its effects on human health, as well as of so-called „healthy eating". The latter issue involves the acceptance of environmentally friendly techniques of farming and breeding, with paying particular attention to minimizing the use of chemicals with an adjuvant effect, which ultimately can play a role in reducing the food supply.

Another factor affecting food security is the climate change. A documented increase of the average temperature on Earth, more frequent extreme weather and chronic shortages of rainfall, combined with the emergence of new, dangerous and difficult to eradicate diseases of plants and animals, make agricultural production require special supervision (FAPA, 2011). Water shortage, unfolding in many parts of the world, is one of the most serious effects of the climate change and is important for the future of agriculture. Access to water is particularly significant for agricultural cultivation and food processing and gains strategic importance where there is a need for additional irrigation of soil. It happens in the case of leading producers of cereals, such as China, India and USA. When it comes to China, 70% of grain production comes from irrigated lands (Zegar, 2007; Sobiecki, 2007). Water shortage is particularly troublesome in the area of South and North Asia and in the Middle East. According to estimates, due to the drought, the forty poorest countries, located mainly in Africa and Latin America, will have the access to agricultural fields limited by 10-20% until 2080 (FAPA, 2011). In addition, the importance of the problem of water deficit is stressed by the growing number of world's human population and increased competition for access to water from other sectors of economy.

Of substantial significance for food security is also the biodiversity preservation. The reduction of the biodiversity has been caused, among others, by urbanization, excessive deforestation and environmental pollution. The ecosystem imbalance and a reduction of fauna and flora diversity together with changing climate have worsened food security conditions. Greater diversity in the ecosystem would prevent escalation of diseases and crop pests (FAPA, 2011).

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5.   Food safety as one of food security's determinants

As already mentioned, food safety is a component of a broader concept, which is food security. This term refers primarily to health issues and also emphasizes nutritional value of food products. However, its wider context (referring also to the methods and conditions of food production and safety of agricultural production) allows to give this category of security a multidisciplinary approach. Therefore, food safety concerns such issues as: the quality of food, its compliance with trade norms, health and nutritional features, including the aspect of the impact of genetically modified food on human health, sensory, physical, chemical and microbiological food characteristics and risk identification of these features in the whole production and distribution chain (Kowalczyk, 2011).

As it seems, the main reason for increased interest in quality issues is the progressive globalization of food markets. Intensive development of international trade in food products, progress in food processing, extended supply chain and distance or time of delivery and not enough transparency of suppliers due to their growing number in the distribution chain and frequent transformation of ownership structure based on acquisitions and mergers in the agri-food sector more common in recent years (Chechelski, 2010), as well as growing pressure to reduce production costs, encourage entrepreneurs to use unfair trade practices.

Another important determinant shaping food safety is growing dominance of global corporations in agri-business. Their presence eliminates many local firms from the market and leads to the marginalization of small and medium enterprises and to the emergence of oligopolistic structure of the food market (Kowalczyk, 2009). The concentration of corporations in global food trade is particularly evident in the supply of cocoa, coffee, bananas, corn and sowing seeds (Kowalczyk, 2011). These entities are trying to distribute uniform consumption patterns, which is useful for business costs reduction. When there are difficulties to accept the patterns by the community, the strategy of regional diversification of products is implemented, often based only on seeming modifications in the product – by changing its packaging or by replacing more valuable components with cheaper ones (as a result, a customer buys food of lower quality) (Kowalczyk, 2009).

Due to growing competition and increasing production costs, using cheap components of low quality in food production has become more common. Another widespread phenomenon concerns misleading a consumer intentionally and offering him imitations of original products under a similar name. In effect, produced food is only seemingly similar to fully nutritious one. It refers to, for example, butter-like and meat-like products. In the former case, animal fat is replaced by plant fat. In the latter one, a substitute of "real" meat is mechanically separated meat of low value (Kowalczyk, 2009).

Taking into account the progressive spatial expansion of multinational corporations, food safety system can not be limited to the borders of a single country. In times of broad and deep economic connections, a food safety system can be effective only when it is extended over many countries.

The system to inform each member of the European Community about food counterfeiting cases was created early, in the 1979. Its present form (expanded to various aspects of animal feeding), is governed by the Regulation no. 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down general principles and requirements of food law, establishing the European Food Safety Authority (EFSA) and laying down procedures in matters of food.

Established in 2002, Rapid Alert System for Food and Feed (RASFF) is based on the exchange of information between member states and was brought into existence in order to eliminate sources of danger arising from consumption of unsafe food and fodder. It is a basic tool of the EU's policy of keeping food safety. It is also worth noting that the cooperation network under analysed system is quite complex. It links member states, European Commission, European Food Safety Authority and Norway, Liechtenstein and Iceland (EU, 2009). Moreover, the network is open for cooperation to third states, candidate countries and international organizations, on the basis of the agreement with the EU (Rybińska et al., 2011). In addition, European Commission and the RASFF system work

together with a global system called International Food Safety Authorities Network (INFOSAN), which is a joint initiative of WHO and FAO. Currently, INFOSAN connects 177 countries and monitors the world food market in order to eliminate products of low nutritional parameters and counterfeit or harmful ones (Kowalczyk, 2011).

In recent years, the exchange of information through the RASFF system has significantly increased. For comparison, in 1999-2001 the number of notifications reached about one thousand per year. In the second half of the last decade (the years of 2005-2008), the transmission of information was multiplied and the analysed figure was about 7,000 per year (Kowalczyk, 2011). A clearly increased number of notifications indicates the escalation of the problem, which is the placement of unsafe food and animal feed on the market.

Among many reported incidents, for example, one of the most serious threats was the detecting in 2008 mineral oil in sunflower oil originating from Ukraine. This problem touched 39 countries and also 99 so-called "follow-up" notifications were registered. Another spectacular (because of its global scale) case, in the same year, concerned the discovery of melamine in food imported from China. 84 original RASFF notifications and 101 "follow-up" ones were then registered. Also a controversial issue at that time were the dioxins in pork originating from Ireland. This phenomena covered 54 countries. Moreover, 230 "follow-up" notifications were received (EurActiv, 2009). The number of notifications shows the necessity of intensive cooperation among countries within the RASFF system, also on global scale.

6. Conclusion

In the context of increasing challenges as a consequence of globalization, the direction of the CAP reform seems to be appropriate. However, the solutions adopted by the European Parliament and the Commission regarding the future shape of agricultural policy put member states in front of major difficulties in meeting them. Among many adjustment areas, the problem of food security is worth special attention – particularly its third dimension, i. e. health and nutritional aspects of food. This is related to the ongoing process of destruction of the environment and the intensification of international trade carrying a lot of threats to food offered to consumers. It can be assumed that European society's awareness about healthy eating is enough for being able to take remedial actions to maintain food safety. But from the perspective of the entire globe, there are many countries and regions unprepared to cooperate in this area, because of the enormous difficulties in meeting by them the first two determinants of food security, i. e. physical availability and economic accessibility (Kowalczyk, 2011). Therefore, the effectiveness of the EU's food safety policy is determined not only by deepening the cooperation among members of the Community, but also by supporting third countries having problems with guaranteeing physical and economic access to food (in the context of increasing trade with third countries and of reported numerous notifications under the RASFF system about potential threats to safety of food imported into the Union) (EurActiv, 2009). This type of initiative seems to be necessary to deepen cooperation regarding exchange of information and rapid elimination of food hazards.

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THE NOMINAL CONVERGENCE CRITERIA
AND THE EUROPEAN UNION MEMBER STATES OUTSIDE THE EURO AREA

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Abstract. The article deals with selected current problems of the euro area enlargement. It focuses on the nominal convergence criteria and their fulfilment by the European Union member states which have not yet adopted the common currency. The author reminds the problems connected with these criteria and sums up the discussion on them, which is conducted in the literature. On this basis, some important conclusions are made, concerning the future of the convergence criteria and of the euro area, especially in the context of its enlargement. The main proposition is the modification of the criteria, particularly those relating to the inflation and the exchange rate. The introduction of a criterion linked more strictly to the real convergence seems also to some extent justifiable. The methods used in the research process are the most popular ones, typical for the economic sciences, i. e. the statistical analysis and the analysis of literature.

Keywords: convergence criteria, convergence, European Union, euro area, monetary integration.

JEL Classification: F31, F36, F42, O23.

1.   Introduction

Crisis phenomena, taking place in recent years in the world and European economy, significantly influenced the manner of conducting economic policy by the EU member states. One of the areas that have been particularly affected by changing trends, is the sphere of monetary integration, advanced considerably in the Community, and of possibility of shaping this process by the authorities. The pace of further enlargement of the euro area seems to be slowed down to a high degree, and its future became more uncertain.

An issue particularly important in this context is the problem of the nominal convergence criteria laid down in the Maastricht Treaty – which determine the possibility of a country's accession to the common currency zone. It is because their design is so specific that it can significantly affect the speed of the euro area enlargement. The possibility of their fulfilment and of conducting effective policy aimed at this achievement, is also strongly conditioned by the phenomena occurring in the global economy. The article focuses on these criteria and on their importance for further development of the common European currency area. The problems connected with the convergence conditions and the discussion on them, conducted in the literature, are reminded. Then, on this basis, some conclusions are made, concerning the future of the criteria and of the euro area, particularly in the context of its enlargement. The methods used in the research process are the most popular ones, typical for the economic sciences, i. e. the statistical analysis and the analysis of literature.

2.   The nominal convergence criteria and their criticism

The formal criteria, that decide about full participation in the Economic and Monetary Union, are a subject of widespread analyses and presentations in the literature, not only economic one, but also e. g. concerning the law. However, as a basis for the further study, it is worth to remind them and to identify their weaknesses and discrepancies in interpretation. It is also very important to emphasize that from the macroeconomic point of view, the nominal convergence criteria are only initial requirements, no more than the necessary conditions of effective participation of a given country in the common currency area. Despite their constant reinterpretation and tightening by the EU authorities, they are not sufficient conditions. To make the EMU membership successful, it is important above all to achieve (ex ante or ex post) the real convergence, which in simplified terms can

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be defined as the similarity of economic structures – that is business cycles, income and productivity levels, prices and wages elasticity etc. (Frankel, 2005; Borowski, 2000; Kurkowiak, 2008; Tchorek, 2008; Pronobis, 2008). Since the nominal criteria refer only to a few macroeconomic indicators, they should be regarded as no more than a reference point – their fulfilment does not guarantee undisturbed functioning of a country in the euro area. To do so, they would have to cover a much wider range of processes undergoing in the economy of a given state, including microeconomic phenomena in particular.

There are a few nominal convergence criteria. The first one constitutes the necessity of achieving "a high degree of price stability" (EU, 2006a) by a country. In practice, it has been translated to a quantitative indicator in the form of Harmonized Index of Consumer Prices (HICP), which may not exceed the reference value. This value, in turn, is calculated as an arithmetic mean of average annual rate of prices growth in three countries with the most stable prices in the whole (!) European Union, increased by 1.5 percentage points (EU, 2006b). It is worth emphasizing that the term "best performing member states in terms of price stability", used in the Treaty, in practice does not mean the same thing as "the member states with the lowest rate of prices growth". It is because when choosing the three countries for calculating the criterion value, member states with the inflation rate deviating down significantly from the mean, especially if it is negative, are not taken into account. Initially (i. e. before 2009), a principle was accepted that countries with deflation (even a minor one) were automatically excluded from the list of "best performers". But in the face of the global economic crisis and the prevalence of deflation in the euro area countries, connected with it, it was agreed that a temporary negative prices growth rate is permitted, provided that it does not diverge significantly from the average European level (EC, 2004; ECB, 2004; EC, 2010a,b;, ECB, 2010).

Such an evolution of the approach to the concept of price stability in the absence of its unambiguous quantitative interpretation deserves the criticism, because under these circumstances the inflationary criterion can be loosened or tightened in the future, depending on existing political needs. Current macroeconomic situation, the forecast of the deflation probable duration time or even more subjective assessment of "significance" of the deviation of prices growth rate in the country from the European mean, constitute a convenient justification for rejecting or taking into account a given member state when calculating the reference value – and it will affect the possibility of joining the euro zone by next countries. In addition, it is problematical to find a reasonable cause that when determining the level of inflationary criterion all the member states of the European Union are taken into account – so not just these that belong to the euro area, and not even only these which plan to join it in a predictable moment in future.

The conditions of accession to the single currency zone also relate to another important area of macroeconomic policy, which is the fiscal one. It is because the country could not be covered by the so-called excessive deficit procedure and its public finance should be stable (EU, 2006a,b). This means the imposition of a limit on two indicators: on the deficit of so-called general government sector (i. e. central government, regional or local government and social security funds) – equal to 3% of GDP – and on the debt of this sector – at 60% of annual GDP (EU, 2006b). However, which is worth noting, this condition is not defined in such a categorical way as the inflationary one, because even in case of exceeding the deficit or debt ceiling, the criterion may be regarded as fulfilled by the Community bodies, if a downward trend, exceptional nature or temporariness of the indicator's too high level is proven (EU, 2006a). So far, this loosened approach to the fiscal criterion's completion has been used particularly often in assessing the level of public debt. At the time of the euro area foundation in 1999, the debt of only three countries acceding to it (Finland, Luxembourg and France) did not exceed 60% of annual GDP in the reference year (1997), and in the case of three of them (Belgium, Greece and Italy) the level was even higher than 100% GDP (EMI, 1998). Similarly, Malta and Cyprus's public debt's ratio to GDP in the reference year of 2006 amounted respectively to 66.5% and 65.3% (ECB, 2007).

Exceeding fiscal limits may also be connected (theoretically at least) with various types of sanctions, which is particularly important for countries which already use the common currency and which are not motivated to maintain an appropriate balance and debt of public finance by the necessity of the convergence criteria fulfilment. Among this sanctions, utilised especially when the state authorities evade persistently the obligation to balance budget, the Maastricht Treaty lists: making public the Council recommendations on the country's fiscal situation, the requirement of publishing additional information when issuing bonds and securities, reconsidering the European Investment Bank lending policy towards the state, interest-free deposits and, finally, the possibility of imposing a financial penalty (a fine) (EU, 2006a).

The macroeconomic theory suggests that during a crisis or recession, in public finance may occur so adverse phenomena that in spite of "good will" of the authorities, who do not intend to increase the fiscal imbalance substantially or even seek to stabilize the situation, the relation of budget deficit and public debt to GDP will increase considerably. It is because public finance during the recession also perform a stabilizing function – they stimulate the declining demand, in an automatic or discretionary way. The reduction in budget balance comes out firstly from lower tax revenues due to a fall in production and income or because of deliberate actions of state bodies, and – on the other hand – from the growing scale of public expenses (e. g. on unemployment benefits). Therefore, the usual result of the recession is the deepening of deficit and, consequently, of public debt, too.

The global recession has led to a major increase in budget deficits and a widespread rise in public debt. However, accepting that the global financial and economic crisis is a phenomenon of a "exceptional" and "temporary" kind, can be a premise to the conclusion that exceeding the permitted level by budget deficit because of the recession is not a lack of public finance discipline. According to the EC Council Regulation from the year of 1997, "excess of a government deficit over the reference value shall be considered exceptional and temporary (...) when resulting from a severe economic downturn" (EC, 1997). Consequently, despite a too high level of the indicator, this fiscal criterion can be regarded as fulfilled. Similar is the situation in the case of public debt, but there is also a downward trend required here (EU, 2006a). One can provide arguments to accept that the biggest global financial and economic crisis of the past few dozen years is really an exceptional phenomenon, and probably a temporary one. But one can also prove just the opposite thesis – the recession's reasons has been accumulating over many years, therefore they are completely "unexceptional", and whether the crisis is temporary, one can specify in fact only from the long-term perspective. As a result, under such conditions, the assessment of fulfilment of the fiscal criteria by next euro zone candidate countries is going to be to a high degree of qualitative, subjective, or – one might even say – arbitrary nature. For this reason, it seems to be subordinated to current political factors, i. e. to the existence or lack of will to the enlargement of the common currency area. Thus, a given state's authorities cannot be certain whether exceeding the fiscal limits, even caused by the global recession, would not close for them the path to the euro for some time.

The Maastricht Treaty also states that a country intending to adopt the common currency, should respect "the normal fluctuation margins provided for by the exchange-rate mechanism of the European Monetary System, for at least two years" (EU, 2006a). This means the formal inclusion of a currency to the ERM2 system, no devaluation of own initiative and maintaining the exchange rate within the range of ± 15% (theoretically, it can also be narrowed) around the designated central relation. Additionally, the regulations require that keeping the exchange rate within the band must be done without "severe tensions" (EU, 2006c).

An issue quite controversial at a time was the answer to the question whether this condition requires formal accession to the exchange rate stabilization mechanism. There were proposals to consider this criterion met if the currency of a country that had not even formally joined the ERM2, was characterized by prescribed stability during a two-year period (Kowalewski, 2001; Bąk, 2008; Schadler et al., 2005; Bielecki, 2005). This was to eliminate possible speculative attacks on it, which

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could occur if the authorities made an official declaration to maintain the exchange rate. However, the considerations were cut off by the EU bodies assessing the fulfilment of the convergence criteria (ECB, 2003; ECB, 2006a) and discussion on this issue subsided.

A distinctive asymmetry of EU authorities' tolerance to central rate adjustments should be noticed in this context. A devaluation is treated as a serious instability of a currency and the failure in the convergence criterion fulfilment. In turn, a revaluation is in practice proved permissible. The European Commission has formally accepted that appreciation tendencies are in many cases "consistent with underlying fundamentals" (ECB, 2008). That is a true statement indeed, especially when taking into consideration the fact that in the period prior to the accession to the common currency area, member states conduct policies aimed at price stability. The mentioned asymmetry relates also to the interpretation of "severe tensions" in the exchange rate. When measuring the exchange rate fluctuations and describing them as "severe", the European Central Bank takes into account, among others, factors determining the exchange rate level (such as interest rate differentials) and foreign exchange interventions (ECB, 2008). In consequence, it is possible to indicate again a large area of subjective and qualitative (or even arbitrary) interpretation. There are signs received from the publications of the EU bodies, that appreciation, if it does not cause the market rate deviations to exceed the fifteen-percent ceiling, is not categorized as "severe tensions". However, there are no such signals with regard to depreciation – and it may be interpreted as the asymmetric narrowing of the lower part of the fluctuation band. Furthermore, it is noticed in the literature that as a benchmark for oscillations below the central rate may still be used the previous limit within European Monetary System, which was -2.25% (Backé et al., 2004; Bąk, 2008; Borowski et al., 2003, 2004; Schadler et al., 2005; Deroose and Baras, 2005; Tchorek, 2004). While the central banks in ERM2 are obliged to take part in interventions at the margins (i. e. usually when a deviation is of 15%), intramarginal interventions are not a subject of such an obligation. Maintaining the exchange rate in narrower bands (which may be needed to fulfil the convergence criterion) can be difficult – not only since the frequency of interventions is usually increased then, but also because of probable isolation of domestic monetary authorities in their activities. A possible exit from this situation is formal setting of narrower exchange rate bands, which would force the European Central Bank to support interventions at lower deviations. But the EU bodies may disagree to it, as well as domestic authorities may not want it because of the higher speculative risk (Michalczyk, 2010).

Another provisions relate to the interest rate level. According to the Treaty, a country aspiring to the euro area should show "the durability of convergence" (EU, 2006a) by an appropriate level of long-term interest rates. In practice, this means that ten-year (or other representative) government bonds yield may not be higher than the reference value. Its level is defined as the mean of interest rates in the same countries that are taken into account when determining the inflationary criterion (i. e. the three with the most stable prices), increased by 2 percentage points (EU, 2006c).

What should be emphasized, the specific numerical values that constitute the convergence criteria (1.5%, 2%, 3%, 60%, 15%) are not included in the main body of the Maastricht Treaty, but in the accompanying protocols. This may indicate that the signatories' intention was to provide some degree of their flexibility and to indicate a possibility of their correction in the future – it is because the amendment of protocols can be procedurally and politically easier than of the whole of the Treaty (Sobczyński, 2002; Oręziak, 2003).

The criticism of the convergence criteria concerns among others the objection that they are determined basing primarily on political factors (Bukowski, 2007; Rosati, 2004) – the adopted limits (3% and 60% of GDP for the fiscal criteria, 1.5% and 2% for the monetary ones and ±15% for the exchange rate) do not have actually any significant theoretical justification, they could be quite different, as well. Only the ratio between the deficit ceiling and the size of debt, equal to 3/60, or 5%, appears to result from the formula indicated in the literature, which defines this relation for stable fiscal policy as equal to the nominal GDP growth rate (De Grauwe, 2003; Rosati, 2004; Szeląg,

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2003). Particularly widely criticized is the implementation of the interest rate criterion, primarily because of high probability of its spontaneous fulfilment in the last period before the adoption of the common currency, and surely after the replacement of the national currency by the euro (König, 2001). However, proponents of this criterion point out that the long-term interest rate reflects the financial market expectations for the durability of meeting the inflationary criterion and for the credibility of fiscal policy, which has an important prognostic value (Borowski et al., 2004). On the other hand, the introduction of the exchange rate criterion seems to be particularly effective, because as a result, during the two years before the expected accession to the euro area, the so-called "temptation to devalue" is avoided. In this case, it could manifest as the authorities' desire to convert the currency at the undervalued exchange rate, in order to boost the exports' competitiveness and to stimulate economic growth. But the restrictions referring to the devaluation, adopted in the convergence criteria, make it very difficult or even impossible in practice.

Table 1. The fulfilment of the inflationary and interest rate convergence criteria by the EU member states outside the euro area in the period of September 2011 – February 2012.

Indicator:	Inflation rate (12-month average)						Long-term government bonds yield (12-month average)					
Month:	IX	X	XI	XII	I	II	IX	X	XI	XII	I	II
Bulgaria	3,8	3,7	3,6	3,4	3,2	3,0	5,5	5,4	5,4	5,4	5,3	5,3
Czech Republic	1,9	2,0	2,1	2,1	2,3	2,5	3,7	3,7	3,7	3,7	3,7	3,6
Denmark	2,7	2,7	2,7	2,7	2,7	2,7	2,9	2,9	2,8	2,7	2,6	2,5
Hungary	4,0	3,9	4,0	3,9	4,1	4,2	7,4	7,5	7,6	7,6	7,8	7,9
Latvia	3,6	3,9	4,1	4,2	4,2	4,2	6,6	6,3	6,0	5,9	5,9	5,9
Lithuania	3,8	4,0	4,1	4,1	4,2	4,2	5,1	5,1	5,1	5,2	5,2	5,2
Poland	3,5	3,6	3,8	3,9	3,9	4,0	6,0	6,0	6,0	6,0	5,9	5,8
Romania	6,9	6,6	6,2	5,8	5,5	5,1	7,2	7,2	7,3	7,3	7,3	7,3
Sweden	1,6	1,6	1,5	1,4	1,3	1,3	2,9	2,8	2,7	2,6	2,5	2,4
United Kingdom	4,1	4,3	4,4	4,5	4,4	4,4	3,2	3,2	3,2	3,1	2,9	2,6
Reference value	2,9	3,0	3,1	3,1	3,1	3,0	7,6	7,6	7,7	7,7	7,7	7,6
Euro zone	2,5	2,6	2,7	2,7	2,7	2,8	4,2	4,3	4,4	4,4	4,5	4,5

Shaded are values below and equal to the reference value (the criterion fulfilled).
Source: own development based on (Eurostat, 2012; Ministerstwo Finansów PL, 2012).

A noteworthy conflict between the inflationary criterion and the exchange rate one, analyzed in the literature (Rosati, 2004), should also be mentioned. It occurs especially in view of a high degree of capital flows' liberalization, required by law. This contradiction is justified by the concept of the so-called impossible trinity, relating to the objectives of monetary and currency policy. If free cross-border movement of capital is allowed, the authorities face a choice: either to maintain the stable exchange rate, subordinating the monetary operations to it and giving up their autonomy, or to strangle inflation and to allow the market to adapt freely in terms of the exchange rate. The complexity of this dilemma is strengthened additionally by the Balassa-Samuelson effect (the real exchange rate appreciation), which may manifest either in an increased inflation rate or in nominal appreciation of the currency. The decision boils down in fact to the selection of the priority convergence criterion, but actually it was already made in the regulations of the Treaty – maintaining price stability is to be the primary aim of all the EU member states' monetary authorities.

3.   The convergence criteria fulfilment by non-euro area member states

At the end of 2011 and at the beginning of 2012, European Union member states outside the euro area fulfilled in general the interest rate criterion (Table 1). The exception was Hungary, where the long-term interest rate has begun to exceed the reference value since January 2012. The situation in terms of the inflationary criterion, however, looks much worse. It is met in fact only by the Czech

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Republic, Denmark and Sweden. In other countries outside the euro zone there is a higher rate of prices growth.

Table 2. The fulfilment of the fiscal convergence criteria by the EU member states outside the euro area in the years of 2008-2011.

Indicator:	Net lending or borrowing (% GDP)				Consolidated gross debt (% GDP)			
Year:	2008	2009	2010	2011*	2008	2009	2010	2011*
Bulgaria	1,7	-4,3	-3,1	-2,5	13,7	14,6	16,3	17,5
Czech Republic	-2,2	-5,8	-4,8	-4,1	28,7	34,4	37,6	39,9
Denmark	3,2	-2,7	-2,6	-4,0	34,5	41,8	43,7	44,1
Hungary	-3,7	-4,6	-4,2	3,6	72,9	79,7	81,3	75,9
Latvia	-4,2	-9,7	-8,3	-4,2	19,8	36,7	44,7	44,8
Lithuania	-3,3	-9,5	-7,0	-5,0	15,5	29,4	38,0	37,7
Poland	-3,7	-7,3	-7,8	-5,6	47,1	50,9	54,9	56,7
Romania	-5,7	-9,0	-6,9	-4,9	13,4	23,6	31,0	34,0
Sweden	2,2	-0,7	0,2	0,9	38,8	42,7	39,7	36,3
United Kingdom	-5,0	-11,5	-10,3	-9,4	54,8	69,6	79,9	84,0
Euro zone	-2,1	-6,4	-6,2	-4,1	70,1	79,8	85,6	88,0

* – forecast
Shaded are values below and equal to the reference value (the criterion fulfilled).
Source: own development based on (EC, 2011a).

Table 3. The fulfilment of the exchange rate convergence criterion by the EU member states outside the euro area in the period of September 2011 – February 2012.

Country	Exchange rate regime	Member of the ERM2	Monthly ERV (Exchange Rate Volatility)					
			IX	X	XI	XII	I	II
Denmark	conventional peg	yes	0,2	0,1	0,3	0,3	0,1	0,2
Latvia	conventional peg	yes	0,4	1,5	3,6	1,3	1,5	0,7
Lithuania	currency board	yes	0,0	0,0	0,0	0,0	0,0	0,0
Bulgaria	currency board	no	0,0	0,0	0,0	0,0	0,0	0,0
Czech Republic	free floating	no	7,6	4,6	11,2	7,6	7,8	9,2
Hungary	floating	no	10,9	13,4	15,7	10,8	13,9	11,8
Poland	free floating	no	15,3	11,2	7,5	8,9	7,6	8,3
Romania	floating	no	5,2	4,8	2,2	3,8	4,2	1,7
Sweden	free floating	no	12,1	4,4	6,5	4,3	5,6	3,4
United Kingdom	free floating	no	7,1	7,0	6,2	4,8	6,3	7,2

Source: own development based on (IMF, 2010; Ministerstwo Finansów PL, 2012).

In most EU member states outside the common currency area, fiscal imbalances are also quite profound. Even before the global crisis, many of these economies experienced high budget deficits, which have not allowed them to join the euro zone. The crisis has caused further deterioration of the situation in this respect – all countries outside the common currency area aggravated budget deficits even more until 2010 – Hungary at minimum (0.5% of GDP), the most – Denmark (5.8% of GDP, Table 2). Only Sweden and Denmark managed to keep this indicator at a level permissible by the convergence criteria, despite a major decline. On the other hand, among the states outside the euro area, there are a lot of countries with traditionally low public debt, and even in spite of its significant growth as a result of the crisis, it is forecast that over the next few years, a safe level of 60% of GDP is not going to be exceeded in many cases (Michalczyk, 2011b). This group include such ones as Bulgaria (the debt at approx. 18% of GDP in 2011), Romania, Sweden, Czech Republic or Lithuania (about 34-40%). It is worth to mention, however, about the situation of Great Britain and Hungary, where this indicator reaches approx. 80% of GDP. According to the preliminary data for 2011, among countries outside the euro zone only Sweden and Bulgaria meet the fiscal convergence criteria.

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The assessment of fulfilling the exchange rate criterion by the EU states outside the common currency area is quite difficult, due to the fact that only three of them (Denmark, Lithuania and Latvia) take part in the ERM2 system. The remaining adopted different exchange rate regimes, which allow smaller or larger-scale fluctuations. The country outside the ERM2 with the most stable exchange rate is Bulgaria, which has implemented the currency board. A small scale of the exchange rate variations against a background of other currencies, despite floating regime, is also characteristic for Romania (Table 3). In turn, the largest fluctuations concern Hungarian forint and Polish zloty.

As one can notice, none of the countries of the European Union using a national currency, meets all the nominal convergence criteria. Sweden seems to be the closest to it, but it is not included in the ERM2 system, similarly like Bulgaria, which, however, has a bit bigger problems with balancing budget and inflation.

4.   The future of the convergence criteria and of the euro area

A major weakness of the inflationary convergence criterion has been exposed by the global economic crisis. In addition to the mentioned change of approach to the interpretation of price stability, it is distinctive that the monetary criteria – paradoxically – make difficult to join the EMU for countries whose economies appear to be more resistant to the recession (e. g. Bulgaria, Romania, Slovakia, Poland). In their case, the economic downturn seems to have been too feeble to reduce significantly the prices growth rate (or interest rates), at least in the first phase of the crisis. Another imperfection of the inflationary condition is connected with it – the inconsistency between its formulation (and in most cases the reference value) and the inflation target set by the European Central Bank, which is the authority responsible for monetary policy in the euro area. The objective of the ECB is to maintain the medium-term inflation rate below, but close to 2% (ECB, 2012) – while the convergence condition reference value ranged in recent years from only about 1% to over 4%. In addition, an assessment based on the Treaty criteria applies to the past results (ex post), whereas the European Central Bank sets out objectives for future outcome (ex ante). Different interpretation of the Treaty concept of "price stability" used in relation to the euro area candidate countries (convergence criterion) and to the states already belonging to it (the ECB's inflation target) seems to have no justification, at least in economical terms (Bąk, 2008; Pronobis, 2008; Schadler et al., 2005; Deroose and Baras, 2005; Borowski et al., 2004). Therefore, a basic postulate constitutes the necessity of deciding what is to be the ultimate purpose of the convergence criteria – forcing the candidate economies to match the indicators of the euro area, the assessment of the effects of national economic policy or perhaps other considerations, such as political ones. Consequently, a reform of their consistency is required.

In turn, in the context of the exchange rate criterion, some general remarks may be formulated. The exchange rate stabilisation cannot be treated by authorities only as a means of joining the common currency area – but rather as a target in currency policy itself. This stabilisation contributes to many positive phenomena in foreign economic relations, resulting from lower uncertainty in international flows. However, it must be also borne in mind that formal accession to the ERM2 may cause tensions in the foreign exchange market, although it is generally assumed to result in a higher degree of the exchange rate stability. The authorities of countries aspiring to the euro zone must also remember that the construction of the exchange rate convergence condition, including especially the concept of "severe tensions", leaves much space for subjective interpretations and an evaluation of this criterion fulfilment by the Community bodies may differ from the position of the state's government. Finally, when choosing to participate in the ERM2 mechanism, and in particular thinking about quick accession to the common currency area, it should be taken into account that considerable fluctuations taking place in recent years on foreign exchange markets, may make the exchange rate stabilisation very difficult and result in a longer stay in the mechanism, which will mean an increased speculative risk or even exposure to crisis phenomena. Therefore, a kind of radical but justified proposal may be

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previously mentioned elimination of the necessity of formal accession to the ERM2 (voluntary participation) and replacing it with a quantitative criterion referring solely to the exchange rate formation. The determination of the permissible fluctuation band's width should be certainly preceded by extensive research and simulations. However, it would undoubtedly reduce the risk of speculative attacks and could increase motivation of next countries to adopt the euro (Michalczyk, 2011a).

Referring to the fiscal criteria, it is worth recalling that despite the existence of the excessive deficit procedure in the Community legislation, which was to guarantee their fulfilment, it has been so far very ineffective in disciplining member states to maintain balance of public finance. This seems to result mainly from the fact that for political reasons no financial penalties have been imposed. Although at the beginning of the first decade of the XXI century, Portugal covered by this procedure managed to reduce the deficit below 3% of GDP from the initial level of above 4%, Germany and France, as well as Greece and Italy, for many years at that time neglected the requirements of the Treaty, in fact with impunity, which incidentally caused much controversy (Pietrzak, 2005).

Keeping a long-term, highly negative balance of public finance by Greece was one of the fundamental causes of the so-called Greek crisis emergence at the end of 2009. In addition, this country's authorities falsified statistics in this regard for many years. The disclosure of this practice has led to the collapse of their credibility, the securities' rating and investors' confidence and has caused a leap in yields of bonds issued by Greece (Ministerstwo Finansów PL, 2010). The negative phenomena in the sphere of public finance have quickly spread to several other euro area member states – in particular Ireland, Portugal and Spain. In these countries they manifested with budget deficits reaching 10-15% of GDP in 2009 and, following the Greek case, with an increase in bond yields. The analysis of statistical data on fiscal indicators and long-term interest rates of Economic and Monetary Union countries confirms a distinct change in the situation since 2009 and increasing difficulties in maintaining balance of public finance and in keeping bond yields at a reasonable level. The largest rises in fiscal deficits occurred in the period of 2008-2010, but despite the subsequent stabilization (to a large extent) of the situation in this respect, one can still observe a progressive increase in public debt. And although these problems affect actually every country in the EU, in the euro area they are particularly dramatic because of large scale of a rise in yields of some states' government bonds. Until the year of 2007, the difference between the highest and the lowest interest rate of long-term bonds issued by euro area countries did not generally exceed 0.5 percentage points (Eurostat, 2012). Later, this disparity has increased – slightly at first, to about 2-3 percentage points in 2009. Then, since the beginning of 2010, the difference between yields of German securities (the lowest interest rate in the euro area) and Greek ones (the highest yield) has begun to rise rapidly, reaching the ceiling of as much as 27 percentage points at the beginning of 2012. This unfavourable phenomenon, apart from Greece (the yield of ten-year government bonds in February 2012 amounted to almost 30%), applies also to Spain, Slovenia, Cyprus, Italy (5-7%), Ireland (7-8%) and Portugal (13-14%) (Eurostat, 2012). All these countries have therefore increasing problems with financing their debts.

A growing degree of interest rate diversification in the monetary union member states could mean that nowadays a risk premium is going to be more important for its level formation than the currency in which securities are denominated, or the mere fact of using the common currency (Ministerstwo Finansów PL, 2012; Ehrmann et al., 2007; Barrios et al., 2009). Consequently, countries with less credible economic policy or more unstable system of public finance, to a lesser extent are able (and will be, as it seems) to count on a significant reduction in their bonds' yield as a result of belonging (or accession) to the euro area.

In order to counter the crisis phenomena in Greece, and later in the rest of countries experiencing an increased risk of default, other European states have started activities focused on financial support, although it must be noted that there emerged also other, more controversial proposals, such as the

exclusion of indebted countries from the common currency area or letting them go bankrupt (Ministerstwo Finansów PL, 2010). The Community legislation introduces a principle, complied so far, of self-responsibility of the EU member states for their own financial commitments, but also decides that "where a Member State is in difficulties (...) caused by (...) exceptional occurrences beyond its control, the Council (...) may grant (...) Community financial assistance to the Member State concerned" (EU, 2006a). This provision allowed to recognize that Greek problems were caused by "exceptional occurrences", and to accept a stabilization aid fund worth 110 billion EUR, as well as to take other actions aimed at restoring the credibility of this country's economy (Gostomski, 2010; Ministerstwo Finansów PL, 2010; Lubiński, 2011). In the first half of 2010 the European Financial Stability Facility (EFSF), worth 750 billion EUR, was also created – first in a temporary form, and since 2013 it is to constitute a permanent anti-crisis fund (the European Stability Mechanism – ESM). In the first place, in February 2011, Ireland benefited from this fund's loans – at the end of 2010 it was granted financial assistance of 85 billion EUR of total value. In June 2011, Portugal became another beneficiary, and was guaranteed the support of general value equal to 78 billion EUR. In November 2011, the fund awarded another tranche of aid to Ireland (EC, 2012).

Therefore, present and future members of the euro area, particularly those of traditionally feeble fiscal discipline, can gain credibility as a result of enhanced cooperation at the level of public finance and of the introduction of support when facing problems with balancing budget. This may constitute a stimulus to greater determination to adopt the common currency and to conduct reforms, at least during the period of assessment of the convergence criteria fulfilment. However, the possibility of obtaining assistance from other EU countries in a critical situation, especially in the case of countries with weak public finance discipline, may result in a temptation of less caring about fiscal balance than in the situation if they could rely only on themselves. To counter such a phenomenon and to increase the stability of the EU financial system, the Commission proposes an amendment to existing legislation, particularly with regard to: changes in preventive standards of Stability and Growth Pact, introduction of monitoring of the public debt level as it is in relation to budget deficit, tightening penalties for not respecting fiscal discipline and modification of procedures for fines imposition. Other considered propositions include the possibility of joint bond issue by the euro area countries, regular observation of various macroeconomic indicators of member states, broadening the Eurostat's competences with the control of quality of data submitted by countries, close coordination of economic policies and, however not very feasible, even the centralization of economic authorities of the euro area (Ministerstwo Finansów PL, 2010; Michalczyk, 2011b). All these activities are designed to extend the oversight of fiscal indicators, in order to avoid deepening of the crisis, and also its repetition in the future.

Another negative phenomenon, which may to a large extent weaken the EU member states' determination to deepen the process of monetary integration, or even challenge its validity, is specific disappointment with the effectiveness of stabilization mechanisms that were assumed to be included in this process. It is because the adoption of the common currency in the year of 1999 by the most part of European Union countries was to contribute to the development of international trade, to greater macroeconomic stability and – above all – to economic growth. Nevertheless, the crisis having its source principally in the U.S. economy has moved to Europe in a very easy way, one can say, and the use of the euro has not weaken significantly the scale of the recession in recent years. It seems that the main cause of the rapid spread of the crisis phenomena may be – connected with the integration process – the elimination of the exchange rate and of autonomous (at the national level) monetary policy as instruments absorbing exogenous shocks (Michalczyk, 2011b). Moreover, if one adopts the real GDP growth in the three-year period of 2008-2010 as a measure of the scale of the recession caused by the global crisis, then among ten EU countries touched by it in the smallest degree, there will be as much as four non-euro area ones (Poland, Sweden, Bulgaria, Czech Republic) and three member states that have adopted the common currency relatively recently (Cyprus, Malta and

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Slovakia) (Eurostat, 2012). Achieving the best result in this respect by Poland under the circumstances of using a national currency, constitutes an important reason to consider carefully the moment (and perhaps even validity) of the accession to the monetary union.

Also in the period before the crisis, the expectations towards the Economic and Monetary Union, such as accelerated economic growth and macroeconomic stability, were not met. The real GDP growth rate in the euro area remained at a fairly low level and in the years of 2001-2008 was lower than in the whole European Union, during the period 2001 to 2005 – than in the UK, and since 2002 to 2005 – than in the U.S. (Eurostat, 2012). In the case of Germany, the euro zone's biggest economy, a stagnation until the year of 2005 is clearly visible. In turn, the unemployment rate in the Economic and Monetary Union in the period of 2001-2010 was relatively big, higher about 2-4 percentage points on average than in the UK, USA and Japan. Elevated unemployment, in 2004-2006 at a level exceeding 10%, was also characteristic for German economy alone (Eurostat, 2012).

In addition to the basic determinants of the accession to the common currency area, which are the formal Treaty criteria, one should also mention other considerations that affect the possibility of the euro adoption by next countries. The first one is traditional British euroscepticism (as well as Danish and Swedish). It is influenced by historical factors, which mainly include political difficulties in the early integration with the European Community, economic problems connected with maintaining the fixed pound's exchange rate against the dollar, or later the mark, and, finally, less-than-three-year stay of this country in the exchange rate stabilization system in the early nineties, ended with the currency crisis (Wajda-Lichy, 2007). Also important are economic reasons, which boil down to recognition that in the case of British economy, benefits from monetary integration (mainly in the sphere of the international trade and of the single market) would be exceeded by its costs and risks, including in particular the loss of monetary autonomy and of the exchange rate as an instrument of adjustment. Watching current difficulties of the euro area, related to the fiscal crisis in Greece and other member states, certainly contributes to the strengthening of this approach to monetary integration processes in Europe. In the case of Denmark and Sweden, the conditions of aloofness in the common currency issue are similar and additionally supported by the conducted referenda (respectively in 2000 and 2003), which results were negative.

The social attitude to the accession to the euro zone is not very favourable also in other EU countries using their own currencies. Romania was the only state, where during the survey conducted for the European Commission in May 2011, the support for monetary integration was declared by more than 50% of the population; the number of euroenthusiasts is also greater than opponents only in Bulgaria. A significant downward trend of this indicator should be noted. In Czech Republic and Lithuania, reluctance to the common currency is declared by about 60-70% of the population. It is worth to notice in passing that the question concerning the position towards the euro in the quoted survey was not formulated – as one might expect – "are you for or against the introduction of the common currency", but in a rather indirect way: "are you personally happy or not that the euro could replace the [currency]?" (EC, 2011b).

Another important prerequisite determining the validity and possibility of joining the common currency zone, is also the degree of the real convergence, which, unlike the nominal one, covers not only basic quantitative measures (inflation, interest rates etc.), but the actual ("real") similarity of economic structures – that is, as mentioned earlier, their business cycles, income levels, productivity, prices and wages elasticity etc. It is because fundamentally the less convergent (similar) are the economies of countries that share the euro, the greater is the risk of asymmetric shocks, in the case of which the single monetary policy is helpless (ineffective).

The simplest measure of this convergence, and the most widely used in the analyses, is GDP per capita. It reflects pretty well – as an aggregate – possible discrepancies of the development levels among countries. EU countries with GDP (expressed in Purchasing Power Standard) deviating the most from the euro area average are: Bulgaria (approx. 40% of per capita product in the common

currency area, according to data of 2010), Romania (about 43%) and Latvia (approx. 47%). In turn, the highest convergence characterizes the UK (103%), Sweden (114%) and Denmark (117%) (Eurostat, 2012).

The theory of optimum currency areas suggests a number of criteria that should decide about the validity of the monetary integration process. Although a part of them was included in European law, it must be emphasized that others, such as e. g. prices and wages elasticity, economic openness, diversification of production, real convergence, have not been adequately reflected in the treaties (Borowiec, 2008; Bąk, 2008; Gawlikowska-Hueckel and Zielińska-Głębocka, 2004). This was partly justified by the fact that some conditions have been met in a somewhat spontaneous manner. For example, the international trade among the EU member states has been since many years at such an advanced level, that these countries, particularly smaller ones, can be given as a classic example of open and integrated economies. In the case of Belgium, the Netherlands, Slovakia or Hungary, the size of the international trade is even larger than their GDP.

Therefore, a specific postulate, which incidentally has been lifted since a long time, is the enhancement of the Treaty criteria with an indicator relating more strictly to the real convergence. E. g. GDP level or growth rate, real wages, either in absolute terms or in relation to other economic indicators, or coefficients of business cycles correlation could be used as a measure of this kind. However, it should be borne in mind that so far, efforts directed to the reform of the convergence criteria even at a basic level, have not produced any results, despite the crisis in the euro zone forcing their review.

5.   Conclusion

The situation of EU member states outside the euro zone in terms of the nominal convergence criteria fulfilment is not satisfactory. At the beginning of 2012, none of these countries met all of them. Therefore, in this respect, the process of further enlargement of the common currency area should be regarded as suspended for at least several years. In addition, a significant revaluation in both the reference values of the criteria and their interpretation, caused by the global financial crisis and fiscal imbalances in the EU countries, causes that the revision and correction of the convergence conditions' design is more and more needed.

The most reasonable proposals in this context include among others: taking into account only the euro zone members (and not all EU countries) when calculating the reference value of the inflation and interest rate, introducing voluntary participation in the ERM2 instead of current mandatory one, replacing the exchange rate criterion with a quantitative one, tightening penalties connected with the failure to comply with the fiscal criteria (with respect both to the countries outside the euro area and to those already belonging to it), possible introduction of at least one criterion that would relate more close to the real convergence. In the current political and economic situation in the European Union, the moment for possible change seems quite good. Negative experience of the member states' authorities, related to the crisis is certainly going to add them the motivation, needed to carry out reforms.

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THE USE OF SELECTED MANAGEMENT METHODS IN LOGISTICS PROVIDED TO IMPROVE THE COMPETITIVENESS OF POLISH ENTERPRISES ON THE INTERNATIONAL SCENE

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Abstract. Many organizations are trying to improve the competitiveness by using various methods and management concepts verified by other companies. Some directing its efforts on quality-oriented concepts, the other on customer and still others on evolutionary or even radical changes in the organization. When asked which method helps to improve competitiveness, it is difficult to answer. Each has its advantages and disadvantages, different approaches to the organization, other internal and external environmental conditions. But for most of them an important element is good logistics organization that promotes economically efficient and effective flow of goods from suppliers through the manufacturing process to the end customer. Thus, logistics plays a very important role, because it has influence to a large extent on the cost of movement and its main purpose is to provide a high level of customer service. Offering customers a competent, good quality product in the right quantities, to the right place at the right time and at the right cost, the company may count on improving international competitiveness. This article aims to present selected management methods, such as Time Based Management, reengineering, benchmarking or kaizen and an indication of their impact on the logistics operations of Polish companies in the international arena.

Keywords: logistics, methods of management, TBM, reengineering, benchmarking, kaizen.

JEL Classification: D21, D29, D39; L29, L99.

1. Introduction

In the activity of any organization there are many different processes that are involved in the process of creating value chain. This is nothing else but a sequence of related operations as a result, the company produces a value, purchased by the client. Each enterprise value chain consists of the basic and auxiliary activities which mutually influence each other and are dependent. Changes in some actions may often induce changes in the cost or efficiency of other activities, in addition these activities go well beyond the reach of the company, including its suppliers, dealers and customers. The basic operations include activities associated with the production and delivery of products to customers, as well as marketing and customer support. They are:

− internal logistics – all things related to the acquisition, storage and delivery of resources for production,
− operational activities – activities associated with the production. assembling, processing, testing, packaging,
− external logistics-storage-related activities and the distribution of the finished products,
− marketing and sales – all steps to encourage purchase, as: promotion, advertising, sales, price, sales policy,
− support – all operations to ensure the maintenance of the value of the product, for example: after-sales service, repair, installation, replacement parts, and training.

Auxiliary activities shall ensure the proper implementation of the fundamental operations by providing them the necessary inputs and services. This is the supply of essential factors of production and human resources (wages, training, motivating, recruitment), technological development (facilities, computers, machinery, telecommunications), purchase of means of production – supply of material and the relevant conditions of the infrastructure (management, finance, planning, accounting, information systems, controlling, quality assurance.

It is very important to so construct primary and secondary steps in the enterprise, from the point of view of the client they value. It is also important to influence the reduction of costs, and maximize the

return on the international scene. Under the present conditions, often of high competition, all operations must be continuously refined and well integrated, and their efficient implementation must effectively contribute to increase the competitiveness of companies internationally. Serve this way used by various methods that the concepts of the management company. Some redirecting its action-oriented concepts on quality, the other on the customer, and still others on evolutionary or even radical changes in the organization. On the question of which of the methods to foster improved competitiveness, it is difficult to answer unambiguously. Each of them has its own advantages and disadvantages, different approach to the organization, other internal and external ambient conditions. But for most of them, an important element is the good organization of logistics, which promotes the smooth and efficient movement of goods from suppliers by offering the production process to the final client. Thus, logistics plays a very important role, since it has an impact largely on the cost of the flow, and its main objective is to ensure a high level of customer service. Offering the customer a competent, a good-quality product, in appropriate quantities, to the appropriate place at the appropriate time, and after the appropriate cost the company can count on improving competitiveness in the international arena. The purpose of article is to provide some management methods, such as Time-Based Management, reengineering, benchmarking and kaizen and the indication of their impact on the operation of logistics in Polish companies on the international scene.

2. Logistics – logistic processes in the enterprise

Logistics according to the Council of Logistics Management whether the European Logistics Association is the process of planning, organizing, implementing and controlling the efficient and cost-effective flow of raw materials, materials, offering finished products and relevant information from the point of origin to point of consumption in order to meet the requirements of the customer, at minimum cost and with minimal involvement of the capital. The concept of "logistics" in the light of the many definitions of means on the one hand, the General knowledge of methods, techniques and principles shaping the flow of products and related information, and on the other hand, the sphere management organizations, specific types of processes (storage, handling, transport, packaging, etc.) and actions, usually structured according to the phases of the movement (the supply-logistics supply, production, distribution of production – logistics – logistics distribution).

In order to have efficient and economically justified logistics, it must cover both the logistic processes and management of these processes. Logistics operations include, inter alia: procurement-planning needs of material, forecasting of demand, maintenance and control of the stocks, the choice of sources of purchase, manipulating materials, organization of supply; the location of the production facilities and warehouses (warehouse), the management of production processes, waste management, information flow, transport and storage operations, packaging, customer service (including the implementation of the procurement and handling of refunds, complaints) and others. Good organization of logistics enterprise should ensure adequate flow of both products and information and at the same time, should pay attention to eliminating, simplify, integrate, automate certain activities, that in this way the processes involved even more smoothly and effectively, economically. Unfortunately, reality is not always allows for changes. In this connection the company decide to introduce management methods, which will have a direct impact on the organization of logistics and at the same time improve the competitiveness in the international arena by providing the customer an appropriate product, place, in the correct quantity, in due time, in appropriate conditions, at the appropriate cost.

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3. Methods of management in logistics

3.1 Reengineering

The reengineering method was developed in the United States in the 80's and became popular in enterprises at the beginning of the 90's with the publication of Reengineering the Corporation (1993). M. Hammer and J. Champy, which are considered to be the founders of this concept of management. This term comes from the abbreviation of the English language Business Process Reengineering (BPR), which translates as the reconstruction of business processes. According to the creators of reengineering is the fundamental rethinking and radical redesign of the new processes within the company, leading to the dramatic (groundbreaking) improved by modern, performance, such as cost, quality, service and speed (Hammer and Champy, 1996). Characteristic of this method is an approach to system orientation processes and project management, elimination of any steps that do not add value added. Consequently, it means the start of everything from the beginning and most often requires radical restructuring in the enterprise, with the change of the organizational structure, including whether the introduction of the new technology of information. In the definition four basic reengineering concepts are included, such as (Hammer and Champy, 1996):

− a fundamental rethink is a means to look over this, why some things are done in this and not the other way, as the company victimized, which introduced major changes to get a favorable result;
− radical redesign – means the introduction of completely newly shaped the company, the new structures and processes, strategy, work practices; staff members should be aware that they work for the client, not for superiors;
− dramatic improvement – means that this method is of interest only to improvements on the grand scale, to see, quickly, high results;
− processes – work of all employees, including managers, should be concentrated on processes, not on the tasks performed; any activity is analyzed in terms of the share in the costs of the chapter business, important is directed precisely on account of the costs of the process.

This method is not easy and requires the fulfillment of basic conditions, such as (Kisielnicki, 2008; Brilman, 2002):

− formulate ambitious targets implying growth of at least 25%,
− the employment of highly skilled and creative executive who wants to achieve success, creating multidisciplinary teams consisting of human creative and best,
− having a clear picture of the full commitment of the directorate, the company pursued a strategy,
− having a modern infrastructure (e.g., information technology),
− enable it professionals to work in a team, already from the beginning,
− focusing processes on the client,
− knowledge of methods and the methods and techniques to support reengineering (among others benchmarking).

The main objective of reengineering is a radical substitution process, elimination of activities not adding value. These objectives have an impact on productivity growth and efficiency throughout your organization, reduce total costs, or whether other changes such as high profits in relationships with suppliers, customers, competitors will help your company gain a competitive advantage. Other specific purposes include inter alia:

− reduce time to introduce new products to the market and the time needed to develop and launch production of a new product,
− optimize the flow of goods,
− reduce storage costs,
− lower costs of order realization,
− improving and increasing the level of customer service,

– the increase in quality,
– reduction of excessive administration,
– higher performance processes and employees,
– elimination of unnecessary operations and reduce delays.

One of the techniques used in the reengineering for the re-organization and improvement of processes is to use the so-called. ESIA (refer to Table 1). This is the abbreviation from English to denote the Eliminate, Simplify, Integrate and Automate. This technique aims at the elimination of all activities which do not create added value and draw attention to those that raise them from the point of view of the customer (Peppard and Rowland, 1997). This technique allows to find areas for improvement in every aspect of the functioning of the company, including logistics.

Table 1. Technique for improving the processes of the ESIA.

Eliminate	Simplify	Integrate	Automate
Overproduction	Forms	Task	Getting dirty
Wait time	Procedure	Teams	Handling difficult
Transport	Transmission of information	Customers	Hazardous activities
Way of implementation	Technology	Supplier	Getting boring
Stocks	Space problem		The collection of data
Defects/shortcomings	Liquidity problems		The transmission of data
Duplication	Processes		Analysis of the data
Change format			
Control			
Organizational arrangements within the company			

Source: Peppard and Rowland, 1997, p. 225.

In all areas of improvement are visible elements important for logistics, which ensure the smooth and efficient flow of raw materials, components, semi-finished economic, finished. This is important especially when the company works and cooperates with other companies in different parts of the world. And so the overproduction is often incorrectly estimated the demand for products and services, the bad forecast demand, poor supply. The overproduction of contributes, among others. to create unnecessary items to increase the costs of inventory, increase maintenance costs, the costs of transport, risk inventory ageing, impairment of the product. Overproduction also requires more maintenance and equipment, machinery and often additional labor and machinery. Overproduction affected significantly increase in the costs of operation of the company.

Another example of possible actions in improving this wait time. It can relate to all participants in the supply chain. The lack of supply on time in appropriate quantity inputs on each of the workstations in the production line results in a lack of continuity in production, higher costs, not the execution of orders in time, the deterioration of the quality of customer service and consequently may contribute to the client company dissatisfaction both internal and client terminal.

Next steps and processes relevant from the point of view of logistics to inventory and transportation. Unnecessary item leads to additional costs of storage, storage, inventory maintenance, increasing the cost of transport. Excess inventory may result in extending the time of implementation, and the storage of products in large quantities can prove detrimental, since all products are in process of ageing due to new design, projects, exceed expiration date, shortened product life cycle time. Transport in any enterprise is important, but generates excessive costs. Excessive amount of means of transport for both internal and external, unnecessary transport operations and transshipment, poor management of production space, lack of optimization of routes of carriage, bottlenecks, or risk of damage to transport all this should be taken into account in this improvement area. The main benefits of elimination of the transport are primarily:

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- reduction of costs (equipment, people),
- shorter delivery time to the customer,
- less traffic,
- less risk of accidents,
- less risk of damage in transport.

Good organization of movement of both the products and the information has an impact on the entire process of implementation, better performance, quality, lack of duplication of tasks, the better the arrangements inside the organization. Any simplification of forms, procedures, activities, processes, the application of appropriate technology, understandable and good practice and the identification of any seats problem can contribute to significantly enhance the transmission of information, liquidity operations. Another important area is the integration. The appropriate division of labor, combine several tasks in one, creating teams contribute to the faster flow of information, better coordination and cooperation activities, which is important from the point of view of logistics. The introduction of logistics solutions, barcode readers, CRM systems, VMI, ECR in handling customer and contacts with suppliers significantly affect the building of lasting ties and significantly accelerates the flow of information in international trade.

The last area is the automation of all activities and processes that prolong the working time, and at the same time, which does not maintain an appropriate quality of service tool let you. They are dirty, unsafe operations, boring and difficult. In addition, it is important to automate everything is related to the collection, transmission and analysis of information between all participants in the supply chain and within the organization. Different software programs may be applied here.

An important element in the reengineering is to change the organizational structure from hierarchical to flat. This change gives employees greater autonomy and responsibility in decision-making. Each employee is aware of the widening knowledge and knows that he works for the client, not for their superiors. The manager assumes the functions of adviser in contradiction to previous role of supervisor controlling the work of subordinates. In addition, organizational structures are replaced by groups of functional units, which together carry out the process. In addition, each employee is responsible for the implementation of the team throughout the process.

Many companies implementing process reengineering not quick success, as was announced this method. The main factors of their failures by its use of a different kind committed errors to which most can be classified as:
- the lack of clearly formulated objectives, which aims at the organization,
- focus only on financial results,
- lack of interest in the creation of a well-functioning organization,
- fear of loss of existing positions in the enterprise,
- to prepare the organization for the introduction of new computer technology,
- poor infrastructure necessary to carry out the process,
- engaging in a process of people who do not know its basic principles,
- lack of sufficient financial resources to carry out the necessary amendments,
- relief workers organization, thereby limited the ability to make changes,
- fast interrupt process,
- try to repair process and not its amendment.

3.2 Time Based Management

Time-Based Management is a business management concept, which appeared in the 1990s of the 20th century, developed by the Boston Consulting Group. As noted, many of the authors of the time is an important factor in competitiveness, and therefore it should be used by (Zimniewicz, 2008, p. 65):
- shortening the process – saving you time,

- keep your appointment time – punctuality,
- form to the newly existing processes – liquidity time,
- the development of new products and processes – innovation.

Time is particularly important in the logistics, since it determines the flow of products and information from sources of supply, through production to the final customer in the shortest possible time. All participants in the supply chain are waiting for the timely delivery, at the lowest total cost. In addition in logistics there is so-called the dependency of costs, which means that changes in one cost may increase or decrease in others. So for example in case of transport - decreasing the cost of transport - use of cheaper, slower means of transport – involves longer delivery time and increases costs of inventory and warehouse requirements, as the company must maintain a higher level of inventory.

Otherwise it looks like a traditional company, and otherwise the company oriented on time (refer with Table 2). In undertaking the traditional costs of this standard, a measure of financial results are obtained, used capacity, the results of individual or branches. In the enterprise-oriented time-time is standard, and is a measure of productivity, flow, and the results of the team.

Table 2. Cost and time as standards of measurement.

The traditional company	The company focused on time
Costs as standard	Time as standard
Financial results of the central point of interest	The productivity of the central point of interest
The measurement of the capacity utilization	Flow measurement
Measurement of the results of individual or branches	Measurement of the results of the team

Source: Zimniewicz, 2008, p. 225.

Main thesis of TBM is that competition led to time focuses on processes. (Zimniewicz, 2008) And therefore the TBM is a competitive advantage companies, expressed such parameters as: speed, punctuality, innovation and compliance with the expectations of the client. This approach is aimed at reducing the time for the implementation of actions at the level of operational and strategic. Strategic actions include: shortening the loopback loop, decentralize the organization whether to accelerate the circulation of information. For operational activities could include limiting the size of the lot, the increase of responsibility for carrying out the actions, change the order of the steps, the elimination of the activities and the parallel conduct of the process.

The concept of TBM is based on five main assumptions such as (Zimniewicz, 2008):
- orientation on the factor of time – time can be measured;
- orientation on the quantitative leap – success can be achieved only by operations on a large scale; marginal improvements are not sufficient;
- orientation on the process – this allows the optimization of processes and establish processes with the crossing places;
- orientation to values – means the elimination or reduction of conflicts in places of cutting processes with features; allows the decommissioning of those operations which do not create value;
- orientation on the team – with the help of the team conflicts will be resolved in places where processes cross with functions.

TBM allows to compare and verify the performance of the enterprise, the efficiency by using various parameters of measurement. The most common expressions of time include (Zimniewicz, 2008):
- cycle time – the time of implementation of the process,
- total cycle time – the time of customer needs,
- current time cycle is the actual cycle time,

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- theoretical cycle time is the sum of the times of processes that bring added value to the,
- the baseline - is the generally accepted level of efficiency in the industry,
- position among the competition – the actual level of performance: in the industry: reached cycle time.

Time savings can be achieved, among others through precise and clear determination of objectives, companies, departments, positions according to e.g. the Pareto rule, methods of ABC, Eisenhower matrix, model SMART, or just properly determine the current objectives, short-term medium-term and long-term. According to Hassig saving time can also be accessed by:

- elimination of warehouses – get rid of unnecessary items, reducing maintenance costs and the costs of storage, manipulation of material,
- removing errors in all phases of the movement is to contribute to the improvement of the quality of products, processes, will increase the level of customer satisfaction,
- continuous improvement of processes, both the supply, production and distribution,
- limiting the size of the lot, through better planning, production, customer orders,
- shortening the feedback loop – feedback is generated much faster, so we can more quickly respond to customer needs, faster contact with suppliers,
- accelerating the circulation of information through the use of an adequate flow of information, proper IT system,
- decentralize decision-making, which will speed up the decision-making process and increase the responsibility of employees,
- change the order of the steps whether the elimination of activities not adding value,
- parallel process developments ,
- removing bottlenecks by changing the positions of the organization, the selection of the most advantageous routes of carriage.

3.3 Benchmarking

Benchmarking is a method of management, which had a multiple definitions. One of them says that it is the process of improving the efficiency of your organization by identifying, analyzing, adapting and implementing the solutions applied by the most efficient organizations in the world scale. P. Kotler defined the benchmarking as a piece exploring how and why some companies are more efficient than others. Another Polish author of benchmarking as Martyniak defines (Martyniak, 1996, p. 303-304):

- learning from the best companies by comparing these organizations;
- the search for the most effective solutions for your business and organizational methods, which allow to achieve a competitive advantage;
- comparing the processes that are involved in the design, manufacture and logistics of products or services from competitors and the best companies in the industry processes;
- continuous evaluation of the products, services, performance and results of the company related to the methods and procedures, and manufactured products or services in terms of performance by industry leaders;
- search for calibration practices by learning from others and use their experience.

The aim is to improve the efficiency of a particular feature, significant benchmarking, specialty or the process. Benchmarking creates value and allows inter alia (Brilman, 2002):

- setting ambitious objectives,
- accelerating the pace of change,
- overcoming reluctance to ideas from outside the company, the output on the outside,
- identify the main processes,
- increasing customer satisfaction and competitive advantage,

− better identify their own strengths and weaknesses by more adequate self-assessment,
− building a climate of agreement on facts and investigation to consensus,
− improve the skills to use in the management of the respective scores.

Benchmarking can be procedural and strategic marketing. Strategic in nature occurs when a company is compared with the leaders in its industry. Procedure when a company is compared with the leaders of any industry, leading in the various fields of activity. In benchmark marketing company systematically examines and compares the reviews with companies competing on quality and essential characteristics of the product.

The use of the main idea of benchmarking has taken place at the beginning of the 20th century. The H. Ford inspired by a slaughterhouse in Chicago in which meat halves were successively transported on special hooks, then he introduced a tape production in his factory. In the subsequent 50-these years, also Toyota used the benchmarking. The Director of Toyota's Taiichi Ohno after the visit in the United States, and the inmates how to restock the racks, which introduced the principle of a kanban card is used also by other industries to this day in various countries of the world. But the origins of the benchmarking in the presented form should be look in the 1970s of the 20th century. Then this company Xerox Corporation began to lose market share to the benefit of Japanese companies that offer lower prices. Xerox market share in the years 1976-1982 dropped from 82% to 41%. Then the company since 1979, decided on the so-called. benchmarking competition. Management has developed three-part program Leadership Through Quality, of which the part II was called Benchmarking. And so for example they searched master logistics solutions in L.L. Bean (since 1981), a world leader in the market for distribution of sport articles, ways of bending sheet metal from Toyota and also used the experience of other companies, such as American Express, Mary Kay Cosmetics and others (Brilman, 2002). The company L.L. Bean had better organized warehouses, which allowed its three times faster checkout, had better productivity of warehouses (refer with Table 3). In order to plan future actions, there was found the subject for benchmarking, compared various indicators of productivity of warehouses.

Table 3. Comparison of productivity corporate operations Xerox and L.L. Bean.

	Statistics from February 1982r.	L.L. Bean	Xerox
Only for download	Number of orders per day	550	117
	The quantity of the product line of the day	1 440	497
	Number of pieces per day	1 440	640
The entire magazine:	Number of orders per day	69	27
	The quantity of the product line of the day	132	129
	Number of pieces per day	132	616

Source: Kisperska-Moroń, 2000, p. 85.

To improve the movement and operation of the store there were then applied successful best practices in the warehouse processes (refer with Table 4).

Table 4. The best solutions in the industry's inventory.

Stages in the process of storage	The best solutions
Reception of products into store	Computer registration accepted products, providing information on the State of stocks using a portable computer in the Terminal section of the receipts.
Delivery to the place of storage	From the top of the set, but not systematic location that minimizes the distances covered.
	100% verification of the location of the product in warehouse through the statement of the location of the rack with the barcode.
Download products from inventory	Interactive on-line current planning in order to minimize and maximize utilization route person that retrieves the shipping container code.
The movement of stocks	Automatic movement of items in accordance with the daily quantity of orders.
Replenishment	Automatic completion of individual areas in the reserve collection of products from the item previously established lots or on an ongoing basis after the download.
The Shipment	Automatically sorting of downloaded products to the appropriate carrier using a scan of the stickers.
	Automatic preparation of mailing on the basis of previously scanned stickers and weight.
Other preparations	Current (real time) updating inventories based on transactional systems and control activities of the warehouse.

Source: Kisperska-Moroń, 2000, p. 85.

Among the important achievements recorded in various areas of the company, you can highlight the:

- the reduction of stocks of about two-thirds of the,
- decrease control of supplied parts to less than 5%,
- the increase in quality-per million parts of only 150 proved defective,
- double the number of technical drawings per person,
- increase the efficiency of marketing by one-third,
- reduction in the cost of labor service by 30%,
- increase in productivity, distribution of 8-10%.

The subject of each process and function benchmarking may be in your organization, or an entire organization. You can compare the costs of procedures and processes, functions, organizational structure, strategies, products, services, as well as indicators and gauges, including logistics. Typical compared measures of logistics include among others (Kiperska-Moroń, 2000):

- measures of the supply and purchase – the quality of service delivery (e.g., time of delivery, certainty of delivery, delivery, delivery, delivery, flexibility of the advertised late), the efficiency of the delivery (frequency of supply rhythm of supply, the completeness of the delivery), the assessment of work of employees engaged in the purchase of (productivity);
- measures of work in store for storage – study of the efficiency of the organizational and technical (e.g. the volume of stock turnover, time of acceptance, shipment and transshipment of goods, the use of the storage surface area, number of stores, the average freezing capital in inventory, the value of the damage caused in the warehouse, work performance, storage costs, the account of cost-effectiveness of modernization of warehouses;
- measures of production – are the various indicators targeted among others. in increased stocks of work in progress, the timeliness of finished production, reducing production cycles, rhythmicity of the production, the quality of the production);
- measures of transport – inter alia efficiency of transport database (technical readiness index, the average vehicle load capacity), use of the base for transport (rolling stock utilization rate, average delivery time), the working conditions of the rolling stock (history of the rolling stock, the

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number of loaded transports), the efficiency of the work of the rolling stock (index utilization, capacity utilization rate);

− measures of distribution – inter alia the volume of orders, the average cost of implementation of contracts, average order execution time, average delivery time, the readiness of the delivery, the certainty of supply, the share of irregular supply of products, the share of delayed deliveries of products, supply products, share phrases repeated deliveries, the share of the supply of products being advertised;

− measures of customer service – order cycle time, availability of items, limited quantity, the system of complaints, the flexibility of the system, inventory availability, order cycle time, quality documentation, full and timely performance of the contract.

Method of benchmarking despite numerous advantages, also has defects (refer with Table 5).

Table 5. Advantages and disadvantages of benchmarking.

Advatages	Defects
− identifies appropriate for deployment processes, − affects the improvement of the processes implemented in the company, − allows you to deploy newer management methods, such as just in time, − affects the improvement measures and indicators used in the enterprise, − helps to eliminate the effects of the resistance to the changes inspired by the environment of the company, − increase the effectiveness and efficiency of processes, − creates the ambitious objectives, − encouraged to make changes, − allows you to designate the future trends and directions of development, − helps in the designation of priorities for the improvement of many things − is a good way to improve the satisfaction of customers and gain competitive advantage.	− perception of benchmarking as economic espionage or intelligence − inhibition of their own creativity by only copying activities of other companies − create a little better of a product or service, and during this time competing companies can already introduce more innovative solutions on the market or the company from which you draw the model ceases to be the market leader, − difficulties in obtaining information and choosing a partner benchmarking, − costly and labor-intensive method, − do not guarantee immediate effect one must often wait longer for positive results.

Source: Zimniewicz, 1999; Brilman, 2002; Grudzewski, Hejduk, 2004, p. 191.

Also worthy of attention is the fact that in Poland recently there have been contracts signed with many organizations in consulting firms which invite the representatives of other companies on what are called benchmark tours. Thanks to benchmark tours companies can exchange experiences, enhance your knowledge, see what effects bring different tools improvements implemented in businesses from different industries.

3.4 Kaizen

The concept of Kaizen management presented first by Maasaki Imai is rather the philosophy, aims at continuous process improvement in firms, eliminating any steps not adding any value, eliminating or reducing loss inherent in the process, lean production and logistics. This is the healthy sense and low cost approach to management, which allows you to solve problems, make gradual changes, improvement in every aspect of the functioning of the company. These are the changes and improvements made continuously, and not drastically. In contrast to the reengineering applies primarily to organizations developing an evolutionary. Kaizen applies to all employees of the company and focus on activities of kaizen, gemba real places, which is for example. work station properly maintained. On the development impact of kaizen in Japan introduced two concepts: jidhoka and just in time. An important role is also assigned to the development after the second world war the quality management and control processes. For the first time, however, kaizen was applied in the

undertaking of Toyota in the 1950's and 60 's of the 20th century. It is successfully implemented in many enterprises, including Polish.

Kaizen consists of five basic principles (Imai, 2006):

− manage in accordance with kaizen – this principle aims at achieving repeatability through the implementation, maintenance and improvement of standards activities; kaizen management puts on human efforts, morale, communication, training, teamwork, commitment and the same discipline;

− the process and results-oriented processes, kaizen means thinking assumes that in order to improve the results of the first streamline processes, all employees must be aware of and appropriately trained;

− compliance PDCA and SDCA – SDCA (standardize, do, check, and act) standardizes and stabilizes the processes, and the PDCA (plan, do, check, act) streamlines the processes; in the context of the management of kaizen meets two essential functions. maintain standards and improvement of standards;

− quality in the first place – every time, if the company realizes the objectives related to improving quality, lower cost, implementation of supply on time this quality should always be in the first place; cost reduction, timely delivery will not improve the competitiveness of the company, if the product or service that is not of adequate quality;

− base actions on relevant data is taking effective decisions, troubleshooting must be based on reliable data collected, validated, analyzed;

− the next process is the client – you can distinguish the two types of customers in kaizen. the internal client and the external client is employee-customer product; kaizen approach assumes that each process, each executed operation is transmitted to the client; in this connection, it should not be transmitted to the next process of defective goods, or not enough information because, in consequence, the client will receive the product incompatible with its external expectations.

The main goals of kaizen include:

− reducing costs,
− improving the quality of products and working
− greater productivity and efficiency of the work,
− reducing order lead time,
− liquidation of losses and deficiencies
− reducing the number of errors committed,
− increase in productivity of machinery and equipment,
− continuity of production,
− establishment of criteria for the assessment and reward,
− to gain competitive advantage.

Kaizen creates an umbrella for the many strategies, systems, methods and techniques of management, such as customer orientation, PDCA, TQM, and zero defects, kanban, just in time, 5S, Total Productive Maintenance, quality circles, show-yoke, SMED, value stream mapping, leveling and stabilization of the line, discipline in the workplace, automation.

To effectively implement kaizen must be in an orderly fashion following systems. (Imai, 2006) Total Quality Control/Total Quality Management, manufacturing system Just in Time, Total Productive Maintenance, Policy Deployment, system suggestions and working in small groups. From the point of view of logistics, all systems are important, but the special attention deserves Just in Time production system based on a system of pull. Based on the just in time system Total Flow Management has been developed, which is intended to create a supply chain through appropriate planning and organization of the flow of products and information inside enterprises, as well as on the outside.

Total Flow Management (TFM) is a management model created by Kaizen Institute, in which five successive modules allows you to quality, cost and delivery – logistics were as efficient. Another important objective is the introduction of solutions using scarce model TFM lean tools that allow to respond rapidly to the changing needs of clients and produce in accordance with the demand of the market. TFM covers the planning, organizing and controlling the flow of products and information ranging from the supply of needed raw materials, components, components, products provider, by the production process, to the delivery of finished products manufactured to the customer to the final. Largely based on the system just in time, in which one of the main requirements is to eliminate all sources of waste, and also manufacture of pull, which is primarily under the contract. The pull method is that the earlier position of the work they produce only enough products, if exploited the next position. Takes into account only the actual needs of customers. The System pull influences among others. to minimize inventories, and thereby lower costs for storage and maintenance of stocks, but unfortunately can affect higher transport costs (supply of smaller, but more frequent).

TFM consists of five modules that provide the appropriate organization of logistics enterprise, inside and outside, and ultimately provide an appropriate supply chain internationally. Adequate implementation of the various modules is to reduce the time the flow of products, to eliminate losses and activities not adding value between suppliers and manufacturers, producers and customers. TFM pursuits to modules (Coimbra, 2009):

– solid basis – are sought and eliminated the main wastage, anomalies and burdens involved in the process; This module is intended to provide a sound basis so that each employee was aware of changes, knew about the related kaizen activities undertaken;
– design lines – has the task of using various tools to design the layout of the centers, obtain a production line, standardize the work on individual posts, up to reduce setup time machine;
– internal logistics – is intended to provide adequate raw materials, components, components for the next process and contains such key elements as: supermarkets, mizusumashi, synchronization, leveling and scheduling system, pull;
– external logistics has the task of ensuring an adequate flow – raw materials, finished products and information to the customer by managing the storage of raw materials, components, but also the proper organization of transport among others. applying the principle of "milk run";
– design and appropriate supply chain management –has the task of using various lean tools to create the most optimal and efficient flow from the final client through warehouses, logistic centers, warehouses of finished products, cross-docking warehouses, manufacturing companies, warehouses for raw materials, components, up to the suppliers.

4. Conclusion

Today, many companies try to find managers different methods that solve the problems and at the same time will get the competitive edge on the international scene. Many Polish enterprises apply different solutions that let you cooperate with a foreign partner to gain new foreign suppliers, find customers, offer good quality products, good price, good time. Is not easy to introduce management methods, not considering the positive examples from other companies. When companies get proven solutions, examine the methodology, the advantages of large international we begin to wonder whether or not to deploy them. Then, and in these we may strengthen the competitive position of the Polish enterprises. Which of the methods is appropriate for Polish companies? Which of the methods should be applied, from the point of view of logistics?

These questions are difficult to find a clear answer. Every company is different, each has different objectives, different priorities, different work resources, financial resources, technology. All of the presented methods or the concepts of management may be successfully applied in logistics. All the methods presented are intended to introduce positive changes in the enterprise. All seek to eliminate

activities that do not add value added, the focus is on the processes. And so reengineering can refer to a particular process, production line, product or changes in management. In contrast to the Japanese concept of kaizen, changes in the company – are made revolutionary and require a rejection of existing methods, transform, organize a business from scratch. In the reengineering counts above all the achieved result. This requires innovation of the new mode of action, which often substitute management focus on management processes and radical redesign. And here, the company may use benchmarking to see how other companies have structured processes. Unlike other methods, the method involved usually only selected groups of people, teams, procedural. Reengineering often requires greater financial effort, and also to new technologies, particularly information technology. The company seeks to exploit present in kaizen, and particularly significant potential is the potential of a human, his knowledge and skills, involvement in the process of improving all spheres of operation of the company. In the philosophy of kaizen all staff is involved, requires a small investment and a big effort in order to maintain the results.

Creator of the reengineering claim that the successful use of this method in the enterprise allows you to (Zimniewicz, 2009):

− shorten production cycles of at least 70%,
− reduce costs with a minimum of 40%,
− improving the quality of products and customer satisfaction with a minimum of 40%,
− increase profitability with a minimum of 40%,
− extend the market share of at least 25%.

According to the Institute of Kaizen, many international companies reached success is thanks to the adoption of the philosophy of continuous improvement kaizen, and to the major success achieved could include, inter alia, (Tesler and Wiśniewska-Dobosz, 2007):

− reducing the time of execution of the contract by up to 81% over 2 years,
− increase productivity by 50% within 3 years,
− the increase in productivity of machinery and equipment by up to 40% over 3 years,
− reducing the quantity of errors or deficiencies of even 90%,
− reduction of unplanned downtime of machinery even 90%,
− increasing the efficiency and comfort of work,
− reduction of the number of accidents.

The concept of Time Based Management is particularly important from the point of view of logistics, because here the main role of time. No less important is the same as in other methods, process and value added. However, in contrast to the kaizen method does not believe in marginal improvements.

Benchmarking is a method that can be used in every aspect of the functioning of the company, including both supply, production, logistics and distribution. This method allows you to introduce other methods of management, including kaizen, reengineering or Time Based Management. However, it should not be confused with the comparative analysis (refer with Table 6).

Table 6. Differences between benchmarking and comparative analysis.

The Characteristic Of	Comparative analysis	Benchmarking
The primary objective of	– keeping step	– anticipating and outrunning competition – achieving excellence
Methodology	– measurement application – comparison of the costs – determine the deviations	– understanding of the principles – comparison of processes – identification of solutions
Personal scope	– direct competitors – comparisons within the sector	– comparison between sectors – analysis of the competition and the enterprises of non-competitors
The sources of information	– the analysis of the sector – competitors	– the best companies in the field
Scope	– all activities – organization/product	– the entire organization – method – process – function
Rules	– external examination – the activities carried out by the Board of Directors	– research inside and outside the company – full involvement of top management – the participation of all employees

Source: Dąbrowska-Mitek, 2008, p. 27.

In conclusion, the most important benefits of the chosen method of management include the smooth and economically efficient flow of raw materials, components, materials, finished products from suppliers, through the production process to the final client. The flow together with supporting information, will allow the company to target its activities on processes, produce and supply products of good quality, at the lowest total cost. Consequently, the company will ensure a satisfactory level of customer service and get the competitive edge on the international scene.

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HETEROGENEOUS DISTRIBUTION OF MONEY SUPPLY ACROSS THE EURO AREA

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Abstract. The recent economic crisis is regarded as symmetric shock which negatively affects all Eurozone member countries. Even if the whole Euro area is in recession the probability of asymmetric shock arises on the monetary side of the economy. The issue is that money supply is unevenly distributed across the euro area. Different credit money creation increases inflationary pressures not only in long run but also in short-term, especially in house prices. The combination of credit money creation and increases in asset prices contributes to financial instability. The empirical part of the paper is based on the analysis in time-frequency domain. The authors apply wavelet analysis to identify increasing differences of co-movements in money supply between the selected old Eurozone member states and peripheral countries. The authors use the contribution of different member countries to the monetary aggregate M3 as the proxy of money supply distribution across the euro area.

Keywords: wavelet analysis, financial stability, asset prices, monetary aggregates.

JEL Classification: E51, F36.

1. Introduction

The European Central Bank (ECB) announced two main pillars of the monetary policy strategy in October 1998. The first pillar, economic analysis, consisted in short-term to medium-term targeting of macroeconomic indicators, especially inflation rates of 0-2%. The second one, monetary analysis, were based on the fact that monetary growth and inflation are closely related in the medium to long run. The monetary aggregate M3 was used by the ECB as the reference value (the yearly average yearly growth is 4,5%). The macroeconomic theory states, that if growth of money is so rapid that the quantity of money supplied is maintained in excess of the quantity demanded, then the necessary sufficient condition for inflation will exist. However, experiences in real-time monetary analysis provided very poor results. De Grauwe (2007) argues that money supply statistics are full of noises which are significant in low-inflation economies (where inflation rate does not exceed 6%). We assume that money market in the euro area is instable because the upper limit of credit money creation is vanished in the large currency areas. The argumentation is based on the money endogeneity assumption where money supply is determined by credit money demand. Within this idea, the money demand and supply are balanced by money velocity changes. Subsequently, the money velocity changes are significant in the euro area member countries, compared to low inflation. (Kapounek, 2011)

It was not surprised that ECB redefined the monetary policy strategy in May 2003. The Governor Council emphasized that there is not strict link between short-term monetary development and monetary policy decision. The reference value of M3 growth was cancelled and time-frame of monetary analysis shifted from medium to long-term trends. As before the year 2003, monetary analysis take into account the development of monetary aggregate M3 but monetary policy would not react mechanically to deviations of M3 at this new framework. (Trichet, 2003)

Leeper and Roush (2003) showed that money plays an important role in the transmission mechanism. When monetary policy generates significant joint movements in money and the interest rate, real and inflation impacts of policy are larger than when money's response is small. Greiber and

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Setzer (2007) found that liquidity plays a very important role in the transmission of monetary policy on house prices. Therefore the strength of the asset inflation channel could differ across the euro area. And, the role of monetary policy for house prices is less visible at the euro area aggregate level than at the level of individual member countries. Therefore we can expect heterogeneous or/and limited efficiency of monetary policy instruments across the euro area.

Setzer and Wolff (2009) contributed that differences in the monetary dynamics across euro area Member States are related to differences in the economic fundamentals determining money demand. The differences in money demand equation already identified Bosker (2003). He applied dynamic panel cointegration tests with VECM. Subsequently, Setzer, Van den Noord and Wolff (2010) focused on the factors which caused heterogeneity in money holdings in the euro area. They found that not only diversification in income but also higher house prices and higher user costs of housing are both associated with larger money holdings.

This topic becomes to be popular with increase of house price index in Germany during the year 2011. Ferrero, Nobili and Passiglia (2007) pointed out that the period 1992-2000 was characterized by a relatively stable M3 annual growth rate in the euro area, but in the period 2001-2006 the money M3 experienced a phase of strong and persistent acceleration (average annual growth rate of 7,6 per cent). They identified significant increase of deposits in Germany, France and Spain. At the same time, in Italy the decrease of total financial assets caused the decrease of total deposits. They also showed that money holdings liquidity excess conditions in the period 1992-2006 were related to acceleration of non-bank financial intermediaries' money demand and accumulation of marketable instruments. They conclude that the money holdings relate more to portfolio choices than to transaction motives. That implies smaller upside risks to price stability over the medium term than usually argued. The country specific monetary aggregates to highlight the instability of euro area money demand were applied by Nautz and Rondorf (2010) as well. They estimated long-run income elasticity of money demand above one. Their results strongly confirm our assumption of the declining income velocity of money demand in the euro area.

The money supply empirical literature is almost exclusively based on aggregate data for the whole euro area. It is the natural choice because the common monetary policy in the euro area should depend on euro area wide aggregates and not on country-specific developments. However, according to the money endogeneity assumption, the money supply is driven by money demand.

Money supply is defined, in broad terms, as currency plus deposit liabilities of domestic bank (Donnery, 2003). Most central banks compile and publish a money supply at the individual country level in the euro area, so-called national contribution to the euro-area aggregate M3. Mehrotra (2007) identified significant differences in the growth rates of national contributions to M3 across the Eurozone countries. He described co-movements of various national components with the euro area aggregate and discusses possible reasons for divergences in growth rates of national contributions in a panel data framework. Finally, he provides information content of national contributions to M3 using the standard Granger causality tests between monetary aggregates, consumer and equity prices.

In this paper, we assume money supply of the ECB is heterogeneously distributed across the euro area. We follow the money endogeneity hypothesis, especially the thesis that national banking systems create credit money and significantly contribute to the money stock. This contribution is determined by money demand which varies across the euro area.

It is widely agreed that money supply is good indicator of economic activity and leading indicator of future inflation. However, the period of nineties of the 20th century until the mid-2007 is characterized by stable environment of low inflation (measured by aggregate consumer price index or deflator) and sustainable economic growth in the most European countries. The recent problem is financial instability. Borio, Lowe (2002) and Kindleberger (2000) showed that financial instability is caused by increase in loans accompanied by growth in market prices of assets.

Our paper supports the renewed interest in the development of monetary aggregates stirred by the recent financial crisis. Despite the single monetary policy we focus on the heterogeneous distribution of money supply across the euro area. Our contribution is in identification of co-movements changes in time. We apply time-frequency domain analysis to identify different relationship across frequencies, i.e. separately for short term and long run.

2. Methodology

Analysis of time series cyclical movements and co-movement can be basically done in two ways, in the time and frequency domain. The most recent studies of monetary aggregates are dealing with the time domain. The frequency domain usage is wide and obtained results can give more information compared to time domain (Croux et al., 2001). In the last decade arises usage of the time-frequency domain techniques in economic area. It is paid attention to features of enlargement of European Union, as well as co-movement of economic activity and their aspects in optimum currency area (OCA) theory and the European integration process. Hallett and Richter (2007) examined the time-frequency framework in a way that allows accommodate structural breaks and non-stationary variables. Jagrič and Ovin (2004) used wavelets in case of week-stationary processes. Rua (2010) used time-frequency approach for measuring co-movement of economic activity among Germany, France, Italy and Spain via cross-wavelet spectrum. The same methodological approach Rua (2011) applied on identification of co-movement between the money growth and inflation in the euro area.

2.1 Wavelet analysis

The time-frequency domain techniques allows to construct estimate of time series representation from both time and frequency domain perspectives. These approaches give possibility to capture the time and frequency varying features of money supply co-movements within a unified framework. In this way we are able to identify significant changes in national contribution to the aggregate stock of money in the euro area. For this aim we use wavelet analysis. The continuous Wavelet transform of a time series x_t can be written as (Mertins, 1999):

$$W_x(a,\tau) = \int_{-\infty}^{\infty} x(t) \frac{1}{\sqrt{a}} \psi\left(\frac{t-\tau}{a}\right) dt, \quad a > 0, \tau \in R, \tag{1}$$

where mother wavelet takes the form $\psi_{a,\tau}(t) = \psi\left(\frac{t-\tau}{a}\right)$, τ is the time position, a is the parameter of dilatation (scale), which is related to the Fourier frequency and numerator of the fraction $\sqrt{a}$ ensures the conservation of energy.

To be the invertible transform, basis (mother wavelets) functions must be mutually orthogonal, have zero mean value and limited to finite time interval. That is

$$i) \qquad \int_{-\infty}^{\infty} \psi_{a,\tau}(t) dt = 0,$$

$$ii) \qquad \int_{-\infty}^{\infty} \psi_{a,\tau}^2(t) dt = 1, \tag{2}$$

$$iii) \quad 0 < C_\psi = \int_0^{\infty} \frac{|\Psi(\omega)|^2}{\omega} d\omega < \infty; \quad \Psi(\omega) = \int_{-\infty}^{\infty} \psi_{a,\tau}(t) e^{-i\omega t} dt,$$

where $\Psi(\omega)$ is the Fourier transform of $\psi(t)$. There is an inverse wavelet transformation define as

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$$x(t) = \frac{1}{C_\psi} \int\limits_{-\infty}^{\infty} \int\limits_{-\infty}^{\infty} \psi_{a,\tau}(t) W_x(a,\tau) \frac{da\,d\tau}{a^2} \qquad (3)$$

To satisfy assumptions for the time-frequency analysis, waves must be compact in time as well as in the frequency representation. There are a number of wavelets used, such as Daubeschie, Morlet, Haar or Gaussian wavelet (Grençay, Selçuk and Whitcher, 2002).

In order to analyze the relation between two time series in the frequency domain, cross-spectral analysis is often performed. Similar analysis could be also done in time-frequency (scale) domain. The wavelet cross spectrum can be defined as

$$W_{xy} = SO\big(W_x^*(a,\tau) W_y(a,\tau)\big), \qquad (4)$$

where SO is the smoothing operator and W_x, W_y are the wavelet transform of time series x and y, respectively (Jiang and Mahadevan, 2011).

2.2 Data

As we mentioned in introduction, the most empirical studies use aggregate money stock in the whole euro area. In this paper we use national contributions to euro area M3 aggregate. We follow euro area definition of money supply. Datasets are calculated from the national bank's balance sheets of euro area monetary and financial institutions, excluding currency in circulation. The datasets are provided by public available database Eurostat in the period 1997M09-2012M04.

However, the national contributions to euro area monetary aggregate M3 are not equivalent to the national monetary aggregates that existed prior to the start of the monetary union. There are two problems. The calculated data include monetary liabilities to the whole euro area money holding sector, whereas national monetary aggregates included only the domestic money holding sector. Manna (2004) showed that amount of deposits from and loans to the euro area residents excluding residents of the home country is not significant for the most of member states in the period 1997-2002.

Subsequently, Sinn and Wollmershaeuser (2011) showed that capital flows significantly raised between the Eurozone countries. These capital transfers are allowed by European transfer system through which payments by both public and private market participants are recorded, cleared and settled in the Euro Area (TARGET2). The accumulated payment imbalances between Germany and the rest of the euro area hit level of 450 billion euros in September 2011.

We assume that these capital flows do not increase imbalances and biases of the analysis in this paper, as Sinn and Wollmershaeuser (2011) presented, but accelerate credit money creation by national banking systems. Similarly argumentation we can find in papers of Buiter, Rahbari, and Michels (2011), Jobst (2011) or Collignon (2012).

Excluding the national contribution to euro area monetary aggregate we use amounts of ECB´s tender operations (Main Refinancing Operations, Long Term Refinancing Operations and other type of operations) in the period 1999/M01-2012/M06. The monthly sums are calculated from open market operations statistics provided by ECB.

3. Results

Empirical analysis follows several steps. In the first step we show open market operation of the ECB, monthly changes of the monetary aggregate M3 and national banking system's contribution to the money stock in the euro area. In the second step we calculate correlation coefficient to evaluate dependence between Euro area and the selected Eurozone countries. The calculation is divided into two parts, before and after the year 2009. In the third step we calculate moving correlation to have a detail look to the time behavior of dependency. Consequently, in the fourth step, we proceed with

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analysis in time-frequency domain and cross-spectrum calculation. For this reason we use wavelet analysis with Daubeschie wavelet. From practical reasons before application of Wavelet transform it is suitable to remove from input time series long-term trend. This is done via pre-filtering using Hodrick-Prescott filter with (Hodrick and Prescott, 1980). All results are presented graphically.

Fig. 1 shows that there is a clear link between official monetary aggregate M3 and banking system contribution to this monetary aggregate in the whole euro area. Providing and reducing liquidity of the ECB directly implies money stock increasing and decreasing until the end of the year 2008. Since the intensification of the financial crisis in September 2008 and throughout 2009, the European Central Bank (ECB) continued to reduce official interest rates to 1.0 per cent, which corresponds to the lowest level observed among Eurozone countries in recent history. In October 2008 the banks in the euro area were gripped by a full-scale liquidity crisis. The Eurosystem stepped in with massive liquidity injections, using both open market operations and marginal lending facilities. However, the additional liquidity held by banks has not been transmitted to the real economy through credits. The excess of liquidity leaves at the balance sheets of commercial banks.

During the years 2010 and 2011 the ECB reduced liquidity providing by its open market operations. As far as, the ECB had to withdraw excess liquidity by reverse operations in the year 2012. The monetary aggregate M3 significantly decreased during the last years.
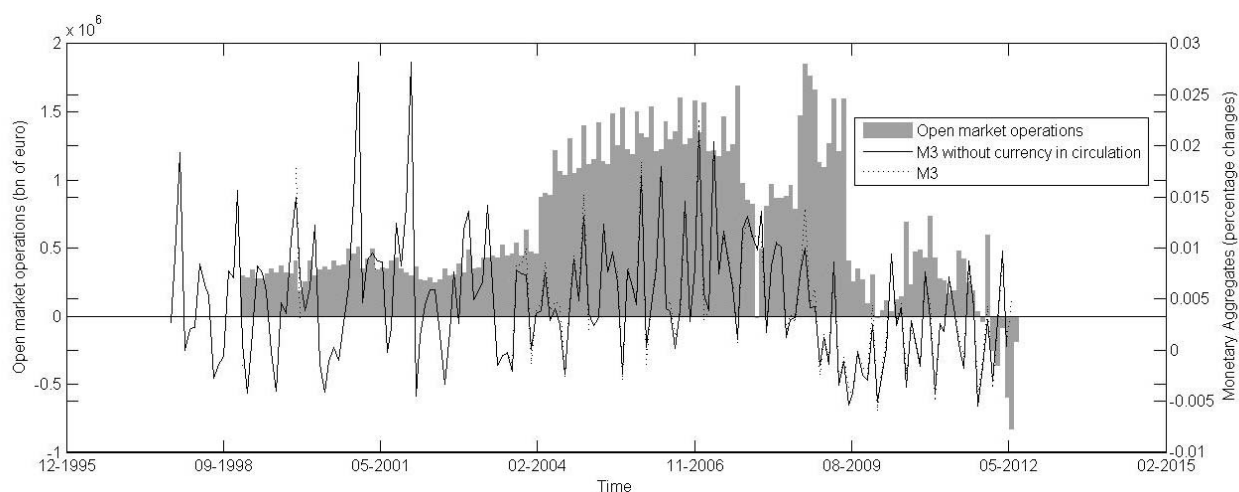

Fig. 1. Aggregate money supply in the euro area (Source: ECB, 2012, Eurostat, 2012).

To identify national contribution to the monetary aggregate M3 in the whole euro area we calculate moving correlation with the 18 values moving window. In the all cases we can identify higher variability of correlation after the year 2009. The first subsample includes Belgium, Germany, France, Luxembourg, Austria and Finland - core Eurozone countries. The second part of the Fig. 2 presents moving correlation of the euro area periphery – Ireland, Greece, Spain, Italy and Portugal.
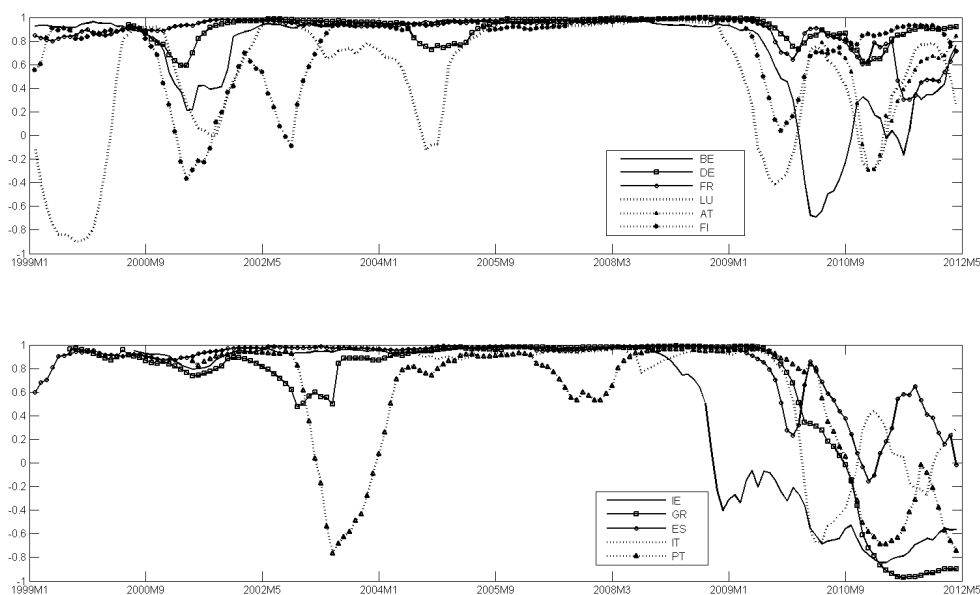
Fig. 2. Moving correlation (Source: Eurostat, 2012).

More detailed view on the money supply distribution across the euro area provides Table 1. We can see that in the first period, except correlation between Euro area and Slovakia, all correlations are positive and statistically significant. In the second period the results are different. Comparing values of correlation in both periods we see differences in the level of correlation and also in the direction of dependence. Obviously, after the year 1999 Germany significantly contributes to the money aggregate M3 in the whole euro area. On the contrary, the monetary aggregate M3 excluding currency in circulation in the whole euro area is negatively correlated with banking system contribution in Greece and Ireland.

Time series correlation does not provide information about the causality. We cannot identify if the money supply shock affected negatively periphery countries or if there exist direct capital flows between Germany and Greece. The datasets used in the analysis are not transformed by first order difference or any other detrending techniques. Therefore, these non-stationary time series probably provide spurious correlation results. However, we can identify significant structural change after the year 2009.

Because time and frequency domain analysis separately are not able to capture this features in complex picture, we will use analysis in time-frequency domain. Thus, following analytical step is focused on time-frequency representation of chosen countries and their time-frequency cross-spectrum representation calculated between Euro area and the country. The country selection was done according to the result of correlation coefficient in the two periods (Table 1). We distinguish three basic cases. The first, the correlation coefficient are not significantly changed (Germany, France). The second, the correlation coefficient is statistically significant, but the direction is opposite (Greece). The third, correlation has changed from significant to insignificant level (Italy).

Table 1. Money supply correlation within the euro area.

	1999M1-2009M12			2010M1-2012M4		
	Correlation coeff.		Sample size	Correlation coeff.		Sample size
Belgium	0,9934	***	148	0,5409	***	28
Germany	0,9919	***	132	0,9151	***	28
Estonia	0,9824	***	22		NA	
Ireland	0,9849	***	130	-0,8627	***	28
Greece	0,9846	***	142	-0,9598	***	28
Spain	0,9974	***	148	0,4301	**	28
France	0,9986	***	148	0,7617	***	28
Italy	0,9758	***	109	0,2640		28
Cyprus		NA			NA	
Luxembourg	0,9737	***	148	0,5235	***	28
Malta		NA			NA	
Netherlands		NA			NA	
Austria	0,7114	***	13	0,7654	***	28
Portugal	0,9681	***	121	-0,7458	***	28
Slovenia	0,7105	**	10		NA	
Slovakia	-0,4175		11		NA	
Finland	0,9859	***	148	0,8893	***	28

Source: own calculation.
Note: Statistically significant at a 1 % (***), 5 % (**), 10 % (*), NA – not available observations

Each figure (Fig. 3-6) consists of five basic charts. The first row consists from two charts in time domain representation of euro area and selected country, the second row illustrates their time-frequency domain representations. The third row represents the charts of time-frequency dependence measurement called a cross-spectrum (more precisely its absolute value) and are illustrated in two (right side) and three (left side) dimensional view.

Looking at the time representation of euro area and Germany (Fig. 3) we see lower level of volatility in Germany. We can see different evolution tendency in 2007-2008 (increase in Euro area, stagnancy in Germany). Also evolution after year 2010 indicates some change/event which occurs before this time, in year 2008-2009. According to the time-frequency cross-spectrum, we can see similar co-movement in the 2nd half of the year 2008 and in 2009-2010. Therefore we can assume/permit that euro area and Germany met in the part of one cycle length in the 2nd half of the year 2008 and in several shorter cycles in 2009-2010. These two cyclical movements showed that national banking system in Germany plays crucial role in monetary aggregate M3 of the whole euro area during the global financial and subsequent European debt crisis.

The time representation of national contribution to the monetary aggregate M3 in France (Fig. 4) shows lover level of volatility compare to euro area such in Germany. We can see also similarity in co-movement in 2009-2010 in several shorter cycles in 2009-2010.

Fig. 5 presents national contribution of the banking system in Greece. The time domain representation indicate stagnant tendency till 2008 with the lowest level of volatility among all selected countries (y-label for Greece is $\times 10^4$). Co-movements measured via cross-spectrum shows wider spectra of cycles with lover level compare to Germany and France. The most important co-movement (the highest level compare to others peaks) can be identified in the years 2009-2010 where we can permit that both economies met in the middle cycles.
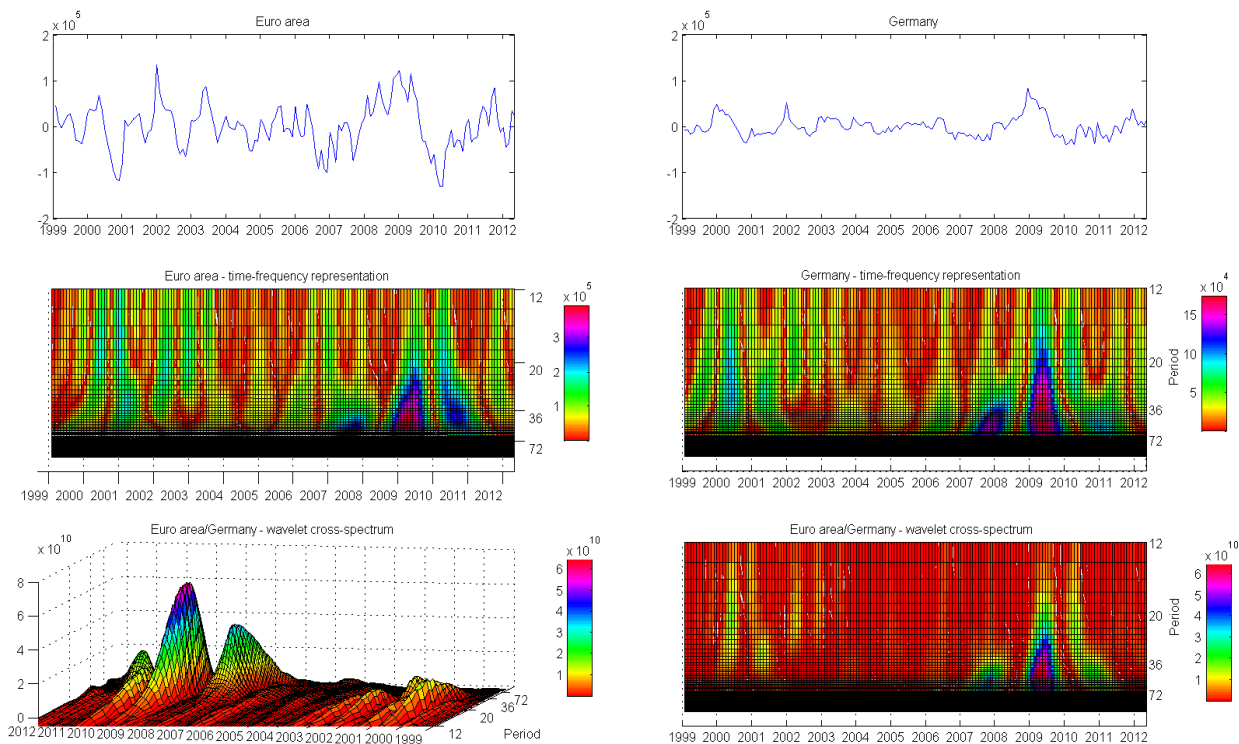
Fig. 3. Euro area and Germany, time-frequency domain representation (Source: own calculation).
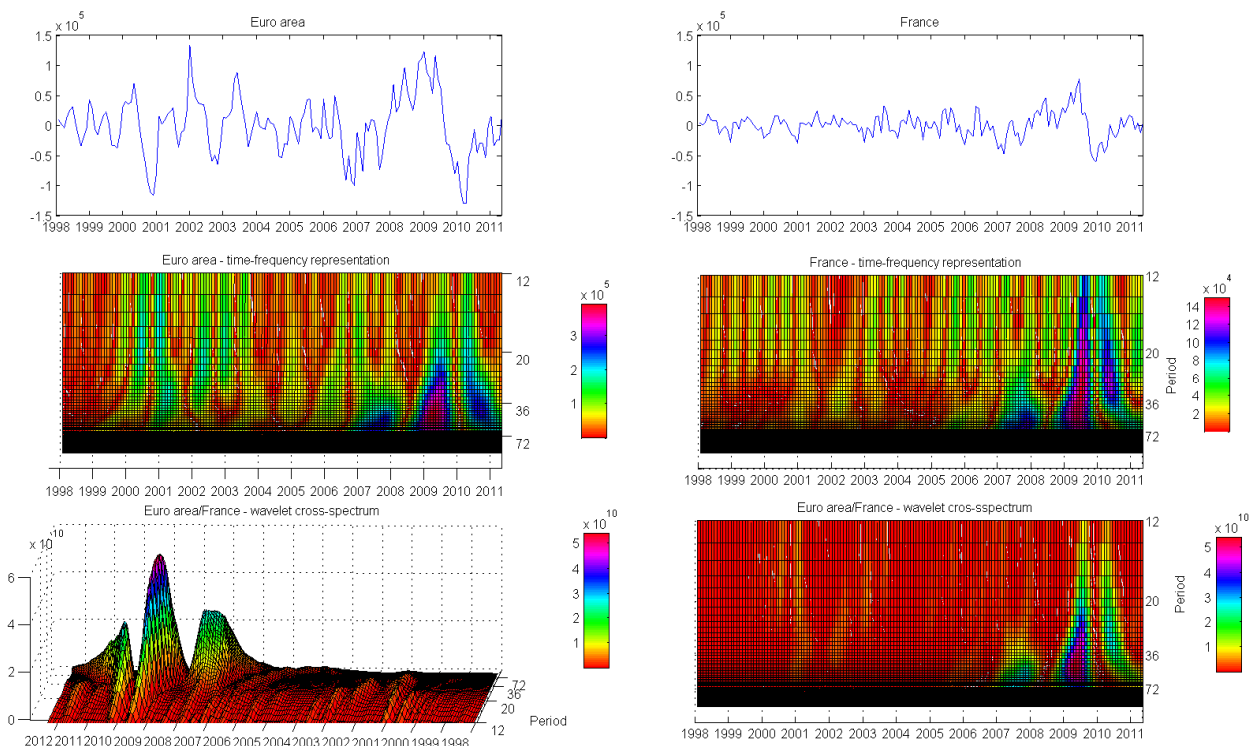

Fig. 4. Euro area and France, time-frequency domain representation (Source: own calculation).
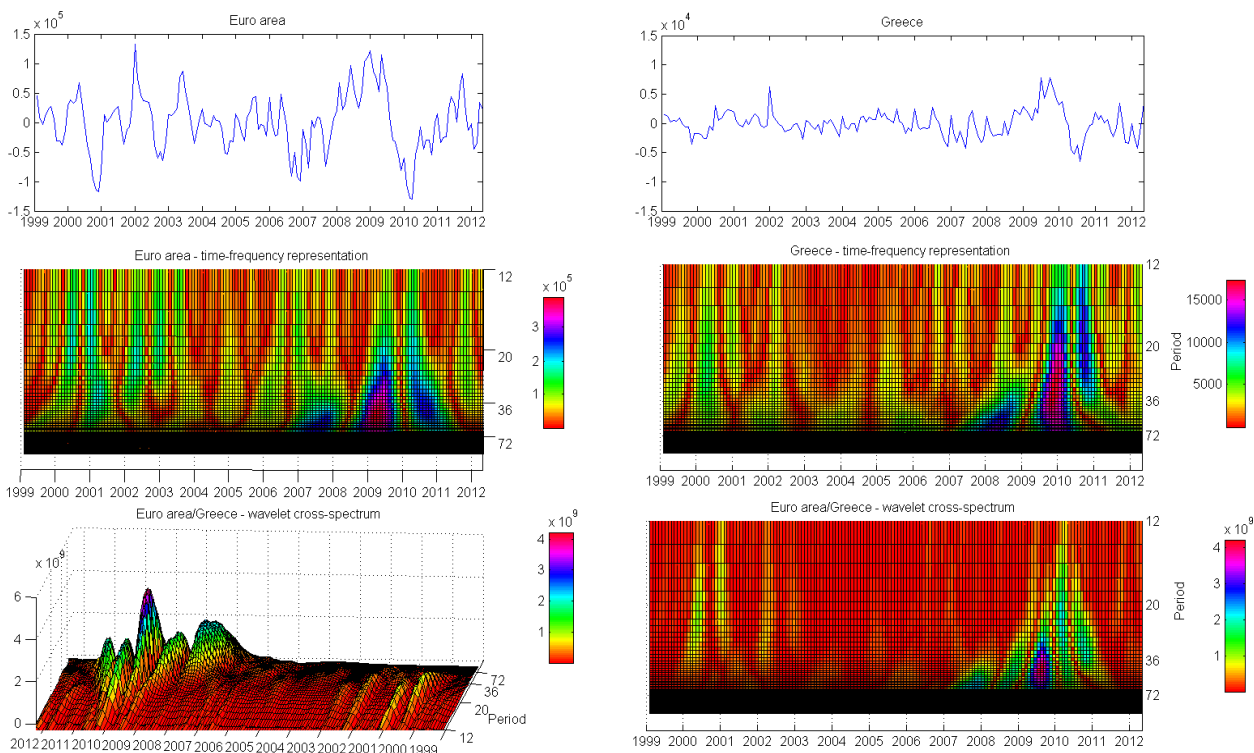
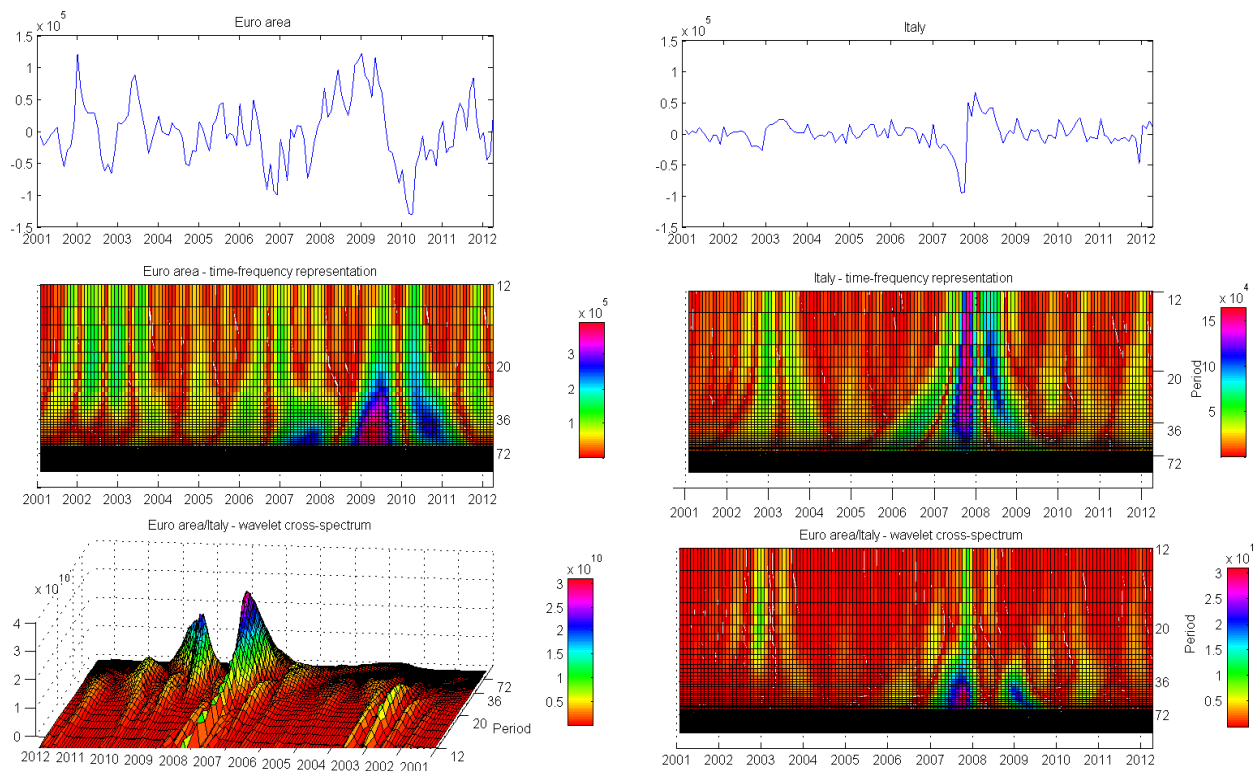**Fig. 5.** Euro area and Greece, time-frequency domain representation (Source: own calculation).

Fig. 6. Euro area and Italy, time-frequency domain representation (Source: own calculation).

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The last case is Italy (Fig. 6). The evolution of the national contribution to the monetary aggregate M3 in the whole euro area indicates different behavior compare to others selected countries before 2007 and after 2009 with structural break around 2008. Consequent time-frequency representation and also cross-spectrum showed different result compare to the other cases discussed above. The banking system in Italy has very specific characteristics which differentiate it from other European countries. It is specialized in traditional activities. Therefore the recent financial crisis mainly affected non-banking financial intermediaries. The reduction in investments and consumption has had a deep impact on specialized credit (leasing, factoring or retail credits).

4. Conclusion

In this paper we provided results of co-movements analysis in time and time-frequency domain. In time domain we identified significant change of the national contribution of the banking systems in the individual Eurozone member states to the monetary aggregate M3 of the whole euro area in the year 2009. After this year the significant heterogeneity of the money supply distribution occurs across the Eurozone. According to our findings, banking system in Germany plays crucial role in the money supply of the whole euro area. In the period 2010-2012 banking systems in Ireland and Greece decrease the money supply whereas the ECB provide liquidity and core Eurozone member countries (especially Germany, France, Austria and Finland) positively contribute to the monetary aggregate.

More detailed information provided wavelet analysis. We identified long and short term cycles in the monetary aggregate M3 (excluding currency in circulation) in the whole euro area. Despite the single monetary policy of the ECB we found it striking that monetary aggregate in the whole euro area and its national contributions have been rather diverse across the member countries.

In Germany and France we identified two separate co-movement periods. The first became with the global financial crisis and the second in late 2009 when the European debt crisis began. Excluding these two symmetric shocks the national banking systems of Germany and France are not synchronized with the changes in monetary aggregate M3 in the whole euro area.

More similarities we found in Greece and Italy. Even if co-movements in these countries have temporary character as well, we can say that the national systems' contribution is often co-moved with the aggregate money supply in the euro area. Probably, periphery countries are more related to the sources provided by the banking systems in the core Eurozone countries.

Even if the single monetary policy of the ECB has a euro area focus, the results of this paper have not only descriptive character. The heterogeneous national contributions provide two important macroeconomic policy implications. (1) Significant differences of national contribution to the money supply is less apparent at the aggregate level and yet could eventually have systemic and financial stability risks for the euro area as a whole. (2) Subsequently, we can conclude that monetary policy (regulation within the meaning of money supply) has not a common character across the Eurozone. Therefore the discussions about the significant costs associated with abandoning autonomous monetary policy are not relevant to the current situation in the euro area. On the contrary, the huge banking system in this monetary union provides high degree of capital mobility. Especially, the liquidity lack could be reduced by its excess in the other parts of the euro area. Withal the process of money creation (credits) is arranged by the banking system, independently of the European central bank and its policy. Thus, the money supply is driven by its demand.

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TRENDS OF COFOG GOVERNMENT EXPENDITURE IN THE EU15

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Abstract. The goal of the paper is to examine the trends of government expenditure in the core member states of the European Union (EU15) in a period 1995-2010. Government expenditure and factors of their growth are a serious problem of many countries. Concurrently, government expenditure is an important tool for national governments to mitigate the uneven economic development and economic shocks across individual countries as a potential automatic stabilizer. The paper provides direct empirical evidence on cyclicality and the long-term and short-term relationship between government expenditure in compliance with the COFOG international standard and output. The Johansen cointegration test and the error correction model are used for analysis. The results state significant differences in size and importance of public sector in the selected countries. Research confirms cyclical development of government expenditure on GDP and Wagner´s law in EU15 member states during 1995-2010. The voracity effect is not verified due to a low statistical significant of findings.

Keywords: government expenditure, cyclicality, voracity effect, Wagner´s law, COFOG classification.

JEL Classification: C32, H50, E62, E63.

1. Introduction

Nowadays, government expenditure and factors of their growth are a serious problem of many countries. On the other hands, government expenditure is an important tool for national governments to mitigate the uneven economic development and economic shocks across individual countries. From a Keynesian perspective, government expenditure should act as a stabilizing force and move in a countercyclical direction. Serven (1998) points that procyclical fiscal policy[46] is generally regarded as potentially damaging for welfare: it can raise macroeconomic volatility, depress investment in real and human capital, hamper growth, and harm the poor. If expansionary fiscal policies in "good times" are not fully offset in "bad times", they may also produce a large deficit bias and lead to debt unsustainability and eventual default. If a government respect a basic prescription that fiscal tools should function counter-cyclical, the optimal fiscal policy involves a decreasing of government spending in "good times" and a increasing of government spending in "bad times."

Contrary to the theory, many of empirical studies found evidence that government expenditure is procyclical. See Hercowitz and Strawczynski (2004), Kaminsky et al. (2004), Alesina et al. (2008), Rajkumar and Swaroop (2008), Hamerníková (2009), Ganelli (2010) or Szarowská (2010, 2012) for more details. Talvi and Vegh (2005) show that fiscal procyclicality is evident in a much wider sample of countries. Analysis of Lane (1998) finds procyclicality in a single-country time series study of Irish fiscal policy. Lane (2003) also shows that the level of cyclicality varies across expenditure categories and across OECD countries. Abbott and Jones (2011) test differences in the cyclicality of government expenditure across functional categories. Their evidence from 20 OECD countries suggests that procyclicality is more likely in smaller functional budgets, but capital expenditure is more likely to be procyclical for the larger expenditure categories. Many of researches as Gavin et al. (1996), Gavin and Perotti (1997) focused on Latin America. On the one hand, Galí (1994) shows in his research that expenditure is countercyclical. However, other papers show no discernible pattern. Fiorito and Kollintzas (1994) document for G7 countries, the correlation between government consumption and output indeed appears to show no pattern and be clustered around zero. The differences in these

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[46] Procyclical fiscal policy is conversely policy expansionary in booms and contractionary in recessions.

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results depend on the components of expenditure being measured. Government transfers and subsidies are found to have become substantially more countercyclical.

Actually, development of government expenditure is often associated with Wagner´s law and voracity effect. Wagner's law states that government activity increases as economies grow, with the pace of increase being different for different branches of government. Voracity effect occurs if a positive shock to income leads to a more than proportional increase in public expenditure, even if the shock is expected to be temporary. The voracity is usually attributed to weak institutions and ethnic fractionalization, manifested in the presence of multiple interest groups seeking to secure a greater share of national wealth by demanding larger public expenditure on their behalf.

The aim of the paper is to examine the trends of government expenditure in the core member states of the European Union (EU15) in a period 1995-2010 and provide direct empirical evidence on cyclicality and the short-term and the long-term relationship between government expenditure and output. Although the theory implies that government expenditure is countercyclical, recent evidence suggests that it is procyclical. Previously published studies are weakly supported by the data from EU15 in which results can vary. We follow Akitoby et al. (2006) and apply Johansen cointegration test (1991) and the error correction model on annul data of GDP and government expenditure in compliance with the COFOG international standard during 1995–2010. The paper is organized as follows. In the next section, we describe the dataset and used empirical techniques. Next we present the results of government expenditure cyclicality and long-run and short-run relationship between output and government expenditure. We conclude with a summary of key findings.

2. Methodology and data

The relationship between government expenditure and output has long been debated in economic literature. Wagner (1911) proposed that there is a long-run tendency for government activities to grow relative to total economic aktivity. Wagner stated that during the industrialization process, as the real income per capita of a country increases, the share of its public expenditure in total expenditure increases. Three main reasons are argued to support this hypothesis: the administrative and regulatory functions of the state, the cultural and welfare services and the state participation to finance large-scale projects for technological needs. It means that government grows because there is an increasing demand for public goods and for the control of externalities.

The existing literature testing Wagner's law varies considerably in terms of the dependent and independent variables chosen to "test" the law. Wagner originally proposed that as industrialization or social progress proceeded, public sectors would grow in relative importance. In practice, researchers use different measures of national income as a measure of this social progress. Peacock and Scott (2000) point out on the fact that there are at least 14 different measures of government expenditure that have been used in the literature, and at least 13 different measures of output, including output per capita. In this paper we adopt the simplest formulation of Wagner's law by focusing on the relationship between aggregate economic activity and government expenditure in compliance with the COFOG international standard. Most studies analyzing the cyclicality of government expenditure and output have used a panel data methodology that has not fully exploited the time-series properties of the data. On the other hand, studies testing for a long-run relationship, such as Wagner's law, have ignored the short-term aspects of this relationship. In the literature on cyclicality, many studies use panel data models that are not well suited to ex-ploring short-term versus long-term relationships. We exploit both the time-series and cross-sectional aspects using an error-correction framework.

The dataset consists of EU15 annual data on GDP and government expenditure in compliance with the COFOG international standard during the period 1995–2010. It is not possible to use higher frequently time series data as COFOG classification analyzes and reports only annual data. The

countries included in the analysis are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom. All the data are collected from the Eurostat database. The series for GDP and total government expenditure and its subcomponent are adjusted at constant 2005 prices. In line with Akitoby et al. (2006), we investigated fiscal and output co-movements by the approach proposed by Lane (2003). We estimated the elasticity of government expenditure with respect to output, based on country-by-country time-series regressions. Next we used an error-correction approach, which allows us to distinguish between the short-term effect of output on government spending and any longer-term effect between these two variables. Most of the results were calculated in econometric program Eviews 7.

Many studies point out that using non-stationary macroeconomic variable in time series analysis causes superiority problems in regression. Thus, a unit root test should precede any empirical study employing such variables. We decided to make the decision on the existence of a unit root through Augmented Dickey–Fuller test (ADF test). The equation (1) is formulated for the stationary testing.

$$\Delta x_t = \delta_0 + \delta_1 t + \delta_2 x_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta x_{t-i} + u_t \tag{1}$$

ADF test is used to determine a unit root x_t at all variables in the time t. Variable Δx_{t-i} expresses the lagged first difference and u_t estimate autocorrelation error. Coefficients δ_0, δ_1, δ_2 and α_i are estimated. Zero and the alternative hypothesis for the existence of a unit root in the x_t variable are specified in (2).

$$H_0: \delta_2 = 0, \, H_\varepsilon: \delta_2 < 0 \tag{2}$$

The result of ADF test, which confirms the stationary of all time series on the first difference, is available on request. Testing the stationary is the essential assumption for implementation of cointegration approach. It is necessary to confirm that time series are non-stationary at level data but stationary at first difference.

We suppose there is a steady-state relationship between government expenditure and output given by (3).

$$G = AY^\delta \tag{3}$$

G represents government expenditure, Y means output and Eq. (3) can also be written in linear form:

$$logG = a + \delta logY, \, a = logA \tag{4}$$

If the adjustment of government expenditure G to its steady-state $\bar{G}$ is gradual, then the level of government expenditure will respond to transitory changes in output, and G will move gradually toward its steady-state, or equilibrium level. To capture this gradual move, we specify a general autoregressive distributed lag specification for spending category i in period t:

$$logG_{it} = \mu + \alpha logG_{it-1} + \beta_0 logY_t + \beta_1 logY_{t-1} + \varepsilon_t, \, |\alpha| < 1 \tag{5}$$

We can solve for the static, steady-state equilibrium by assuming that output is at its steady-state level $\bar{Y}$ and ignoring the error term:

$$log\bar{G} = \frac{\mu}{1-\alpha} + \frac{\beta_0 + \beta_1}{1-\alpha} log\bar{Y}, \, \delta = 1 - \alpha \tag{6}$$

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More generally, we could allow output to grow at rate g. In this case, the only difference is that the constant term becomes $\frac{\mu + (\beta_0 - \delta)g}{1-\alpha}$, which depends on g. To reflect the steady state, (5) can be rearranged as the error correction model (7).

$$logG_{it} = \mu + \beta_0 logY_t + \gamma(logG_{it-1} - \delta logY_{t-1}) + \varepsilon_t \qquad (7)$$

In (7), we can interpret β0ΔlogYt as the short-term impact of output on government expenditure and β0 as the short-run elasticity of government expenditure with respect to output. The error correction term γ(logGit-1− δlogYt-1) captures deviations from the steady-state, or long-run equilibrium, where δ is the long-run elasticity of government expenditure with respect to output, and γ is the rate at which government expenditure adjusts to past disequilibrium. μ is constants of the model, εt means residual component of long-term relationship.

Moreover, (7) can be rewritten as (8) and then used to test if there is a long-run relationship between government spending and output. In particular, following Ericsson and McKinnon (2002), if γ is significantly different from zero in (8), then output and government spending are cointegrated.

$$logG_{it} = \mu + \beta_0 logY_t + \gamma logG_{it-1} - \varphi logY_{t-1} + \varepsilon_t \qquad (8)$$

where φ = γδ. The above derivation makes clear the underlying assumption that there is a elasticity relationship between output and expenditure, while the transitory deviations are random.

3. Results and discussion

3.1 The structure of government expenditure

The structure and an amount of government expenditure is very important for economic policy of each country as it can help in overcoming the inefficiencies of the market as well as in smoothing out cyclical fluctuations in the economy. We used government expenditure in compliance with the COFOG (Classification of the Functions of Government) international standard in our analysis. The COFOG is one of the four classifications of expenditure according to purpose (functional classifications) used in national accounts. COFOG classifies government expenditure into ten main categories / divisions:

- CF01: General public services
- CF02: Defense
- CF03: Public order and safety
- CF04: Economic affairs
- CF05: Environment protection
- CF06: Housing and community amenities
- CF07: Health
- CF08: Recreation; culture and religion
- CF09: Education
- CF10: Social protection

We analyzed the structure of government expenditure in a period 1995–2010. Results in Table 1 show the average share of government expenditure by functions, the average on total expenditure and the share of total government expenditure on GDP in each EU15 member state during the analyzed period. Table 1 also presents the average of variables in a whole EU15.

Data confirm significant differences between EU15 member states. Results state sizeable differentiation in size and importance of public sector and a priority of government expenditure functions in the sample of countries. The value of total government expenditure is the smallest in Ireland (38.5% GDP), the highest in Sweden (55.6% GDP), and the average is 48% GDP in the whole EU15. Interesting is that the value of total expenditure is in PIIGS[47], except Italy, below the average value of EU15.

Table 1. Government expenditure - COFOG classification (in % of total G, resp. % GDP for total G).

Country	CF01	CF02	CF03	CF04	CF05	CF06	CF07	CF08	CF09	CF10	Gtotal/ GDP
Austria	14.35%	1.71%	2.91%	10.31%	1.08%	1.50%	15.09%	1.91%	10.65%	40.47%	51.98%
Belgium	21.30%	2.52%	3.07%	9.42%	1.23%	0.64%	12.93%	2.01%	11.56%	35.33%	51.47%
Denmark	15.41%	3.02%	1.83%	6.13%	0.97%	1.19%	12.73%	2.91%	13.09%	42.70%	55.51%
Finland	13.23%	3.02%	2.61%	10.57%	0.59%	0.93%	12.30%	2.29%	11.96%	42.50%	53.27%
France	14.01%	3.75%	2.89%	6.68%	1.62%	3.31%	13.94%	2.26%	10.99%	40.55%	53.58%
Germany	13.35%	2.56%	3.38%	9.12%	1.58%	1.93%	13.81%	1.74%	8.93%	43.60%	47.40%
Greece	23.21%	6.16%	2.73%	11.15%	1.18%	0.80%	11.96%	0.91%	7.34%	34.56%	46.67%
Ireland	9.64%	1.45%	4.33%	15.60%	2.37%	4.34%	17.58%	1.79%	12.82%	30.08%	38.49%
Italy	21.55%	2.67%	3.99%	8.58%	1.65%	1.71%	12.78%	1.72%	9.46%	35.89%	49.96%
Luxembourg	10.98%	0.97%	2.24%	11.23%	2.94%	2.04%	11.87%	4.29%	11.56%	41.87%	40.76%
Netherlands	14.28%	3.34%	3.85%	11.00%	3.45%	1.84%	12.83%	3.54%	11.33%	34.56%	47.36%
Portugal	15.00%	3.25%	4.24%	10.30%	1.42%	1.75%	14.75%	2.66%	14.43%	32.19%	43.92%
Spain	13.65%	2.74%	4.68%	12.07%	2.14%	2.53%	13.75%	3.54%	11.00%	33.91%	40.80%
Sweden	15.09%	3.54%	2.48%	7.78%	0.54%	2.07%	11.93%	2.31%	12.68%	41.58%	55.60%
United Kingdom	10.90%	6.43%	5.42%	6.69%	1.61%	2.46%	14.63%	2.33%	12.65%	36.88%	43.48%
Average	15.06%	3.14%	3.38%	9.78%	1.63%	1.94%	13.53%	2.41%	11.36%	37.78%	48.02%

Source: authors´ compilation based on data from European Commission, 2012.

The three biggest expenditure functions, on average, account for more than 66% of the total expenditure: Social protection, Health and General public services. In the EU15 as a whole as well as in all individual member states, social protection is the most important function of government expenditure. Social protection expenditure (CF10) takes more than the third of all government expenditure in average. Surprisingly, the highest value of CF10 is in Germany, the smallest in Ireland. It contains, for example, expenditure on sickness and disability, old age, survivors, family and children, unemployment, housing, social exclusion and R&D social protection. The next most important functions in terms of government expenditure are general public services and health amounting to 15% and 13.5% respectively of total expenditure in the EU15. Education (11.4%) and economic affairs (9.8%) follow. The remaining functions - composed of defense, public order and safety, environmental protection, housing and culture - represented in average 12.5% of EU15 total expenditure.

However, the EU15 is not a homogenous group of countries and development of government expenditure and its components differs in individual countries. The highest average value of General public services (CF10) is in Italy, although the value decreased by 10 percentage points in selected period (from 26.7% to 16.4%). We can find very similar values and development in Belgium too. On the other hand, the average value is less than a half in Ireland. There are significant differences in

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[47] Due to the economic recession which started in 2008, several members of the European Union became historically known as PIIGS. These states include Portugal, Italy, Ireland, Greece and Spain. The reason why these countries were grouped together is the substantial instability of their economies, which was an evident problem in 2009.

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value of Health expenditure (CF07). The highest average value (17.6%) is in Ireland - the country with the smallest total government expenditure. The smallest values are in Luxembourg and Sweden (11.9%), even if it is an example of welfare state. Table 1 also presents that the share of other government expenditure functions differs between EU15 member states. Portugal has the highest Education expenditure (14.8%), its share is more than the twice value of Greece (7.3%). Contrary, Greece and United Kingdom have absolutely highest expenditure compare to the rest of EU15 on Defense (CF02) in analyzed period.

Government expenditure relative to GDP progressively decreased in the EU15 between 2003 and 2007, followed by a rise in 2008 and a more emphatic increase in 2009. The development is influenced by the consequences of the economic and financial crisis. The related need for public intervention are the main factors behind the upward trend between 2008 and 2009, and its remaining high level in 2010, as the breakdown of expenditure by functions confirms. The main contributors to the increase in expenditures were social protection and health (for details look at Eurostat database). For example, government expenditure reached 67% of GDP in Ireland in 2010, whereas it was among the countries with the lowest levels until 2008. This jump is largely explained by specific government support to banks during the financial crisis, in the form of capital injections. This type of support is classified as government expenditure in certain conditions (it belongs to CF04).

3.2 The cyclicality of government expenditure

As was already noted, government expenditure can act as an automatic stabilizer. The cyclicality of government expenditure is typically defined in terms of how expenditure moves with the output gap. If government expenditure increases when there is a positive output gap (i.e. output is below its potential), then expenditure is countercyclical. If potential output were observable or easy to estimate, one could define counter-cyclicality as an above average expenditure to output ratio whenever output was below its potential. As Akitoby et al. (2006) mention, measuring potential output is difficult. As a consequence, it is not easy to discuss business cycles or cyclicality per se. Therefore we focus on co-movements of government expenditure and output as a proxy for cyclicality.

Table 2 reports the estimates of the adjustment coefficient γ from equation (7), which is estimated by OLS (ordinary least squares) with a correction for an autoregressive error term. γ is the rate at which government expenditure adjusts to past disequilibrium. In cases where γ is significant, we can conclude there is a cointegrating relationship between government expenditure and output.

The results of analysis indicate significant difference across expenditure functions. For most countries (80%), there is a cointegrating relationship between total government expenditure and output consistent with Wagner's law, the share of significant results is 77% for all categories in all EU15 member states. The error correction term is significant for all expenditure functions in France only. All EU15 member states have a significant error correction term for at least six of the expenditure functions (six in Greece and Spain, seven in Ireland, Portugal, Austria, Germany, Netherlands, eight in Italy, Belgium, Denmark, Luxembourg and nine in Finland and United Kingdom). But the error correction term is not significant for any identical expenditure function in a whole EU15. The value γ express that government expenditure adjusts to past disequilibrium in two year in average.

As expected, the adjustment coefficient γ is mostly negative (in 96% of significant cases), indicating dynamic stability. The implication of a significant error correction term is that there is in fact a long-term relationship between government expenditure and output. But it is suitable to point out that the existence of cointegration does not imply causality, which is consistent with Wagner's view that there is not necessarily a cause and effect relationship between economic development and government activity.

Table 2. The value of adjustment coefficient γ.

Country	G total	CF01	CF02	CF03	CF04	CF05	CF06	CF07	CF08	CF09	CF10
Greece	1.02*	-1.50*	1.43*	4.20**	0.88**	0.58	1.19**	0.76**	2.69*	2.07**	0.78**
	(0.06)	(0.27)	(0.55)	(0.32)	(0.14)	(0.01)	(0.23)	(0.01)	(0.30)	(0.15)	(0.09)
Spain	-0.06	-0.65**	0.74**	0.81**	1.23**	1.37**	-0.20	1.94**	0.98**	2.85*	0.91**
	(0.13)	(0.14)	(0.09)	(0.07)	(0.09)	(0.07)	(0.32)	(0.33)	(0.10)	(0.93)	(0.01)
Ireland	0.36*	1.38**	0.55**	0.14	0.56**	0.13	1.11**	1.20**	0.79**	2.46**	0.86**
	(0.15)	(0.21)	(0.01)	(0.14)	(0.08)	(0.59)	(0.09)	(0.05)	(0.09)	(0.61)	(0.01)
Italy	0.94**	-1.97**	1.36*	3.13**	0.77**	1.66**	0.58**	2.37**	1.96**	0.78**	0.88**
	(0.01)	(0.18)	(0.62)	(0.41)	(0.01)	(0.18)	(0.00)	(0.27)	(0.21)	(0.00)	(0.14)
Portugal	2.34**	0.77**	0.64*	0.68**	0.73**	-0.22**	0.58**	2.55**	0.63**	0.77**	0.89**
	(0.40)	(0.01)	(0.0)	(0.02)	(0.00)	(0.72	(0.01	(0.25)	(0.00)	(0.00)	(0.02)
Austria	-1.07*	-0.77*	-1.75**	-0.61	-1.21*	-1.39**	-1.11**	-0.71*	-0.08	-0.04	-0.61**
	(0.37)	(0.39)	(0.33)	(0.38)	(0.42)	(0.06)	(0.14)	(0.30)	(0.22)	(0.04)	(0.20
Belgium	-0.29*	0.02	-0.63**	-0.78**	-1.07*	-0.15*	-0.87*	-0.37	-0.50*	-0.32*	-0.26*
	(0.14)	(0.55)	(0.13)	(0.13)	(0.39)	(0.05)	(0.38)	(0.21)	(0.23)	(0.16)	(0.09)
Germany	-0.95*	-0.40*	-0.37**	-0.27*	-0.02	-0.40	0.00	-0.73**	-0.50*	-0.45*	-0.14*
	(0.32)	(0.21)	(0.09)	(0.13)	(0.06)	(0.40)	(0.00)	(0.26)	(0.18)	(0.23)	(0.05)
Denmark	-0.21*	-0.12	-0.56*	-0.37**	-0.17*	-0.22**	-0.53*	-0.10*	-0.51	-0.57**	-0.18*
	(0.02)	(0.13)	(0.28)	(0.15)	(0.07)	(0.05)	(0.24)	(0.05)	(0.35)	(0.13)	(0.06)
Finland	-0.16**	-0.22	-0.35*	-0.58*	-0.46*	-0.42*	-0.51*	-0.20*	-0.89**	-0.51*	-0.37**
	(0.06)	(0.16)	(0.16)	(0.28)	(0.21)	(0.13)	(0.19)	(0.08)	(0.18)	(0.17)	(0.10)
France	-0.23*	-0.71*	-0.26*	-0.72**	-0.38**	-0.11*	-0.21**	-0.29*	-0.09*	-0.47*	-0.06**
	(0.12)	(0.39)	(0.14)	(0.22)	(0.12)	(0.05)	(0.07)	(0.16)	(0.04)	(0.25)	(0.01)
Luxembourg	-0.53**	-0.31**	-0.12	-0.35*	-0.69*	-0.81*	-0.94	-0.51*	-0.24*	-0.66**	-0.59**
	(0.16)	(0.09)	(0.08)	(0.16)	(0.31)	(0.26)	(0.23)	(0.21)	(0.07)	(0.13)	(0.12)
Netherlands	-0.08*	-0.01	-0.24	-0.48*	-1.97*	-0.23*	-0.46	-0.05*	-0.62*	-0.73**	-0.15*
	(0.03)	(0.06)	(0.14)	(0.19)	(0.53)	(0.11)	(0.52)	(0.02)	(0.24)	(0.14)	(0.07)
Sweden	-0.50*	-0.55*	-0.48*	-0.38*	-0.64*	-0.55	-0.24**	-0.46*	-0.17	-0.76*	-0.53*
	(0.22)	(0.36)	(0.25)	(0.17)	(0.20)	(0.35)	(0.05)	(0.20)	(0.11)	(0.40)	(0.26)
United Kingdom	-0.20*	-0.21*	-0.20*	-0.30**	0.04	-0.79**	-0.12*	-0.36*	-0.40*	-0.28*	-0.21*
	(0.09)	(0.06)	(0.04)	(0.11)	(0.04)	(0.22)	(0.03)	(0.10)	(0.15)	(0.10)	(0.06)
Average	0.45	0.45	0.56	0.45	0.88	0.47	0.57	0.34	0.5	0.49	0.29
Share significant	80%	73%	87%	67%	73%	67%	67%	80%	60%	93%	100%

Note: Symbols *and ** and denote significance at the 1% and 5% level, standard deviation are in parenthesis. Average means average absolute values of significant coefficients only. Share significant means share of significant cases.
Source: authors´ calculations.

Table 3 summarizes the results about the long- run elasticity of expenditure with respect to output. Results show that the long-run elasticity coefficient δ is significant in 91% cases. A positive value of δ is consistent with a wider interpretation of Wagner's law, as it implies that government expenditure rises with national income. If δ is higher than one then this would be consistent with a narrow interpretation of Wagner's law, where government expenditure rises faster than national income. The long-term elasticity of government expenditure and output δ is mostly positive (in 87% of cases), and it is the highest for Public order and safety (CF03) due to the extremely high δ in Italy (it greatly increased the average). Moreover, δ is for total expenditure larger than one (1.17), average value is 1.30 for all expenditure functions. It is consistent with the narrow interpretation of Wagner's law and indicating that in the long-term, the public sector is increasing in relative importance. The coefficient for long-run elasticity was significant in all EU15 member states only for Health (CF07) and Education (CF09). In Table 3, we can also find the long-run δ lower than one. It means that the

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expenditure functions as Defense (CF02), Economic affairs (CF04) and Housing and community amenities (CF06) rise slower than national income in the long term.

Table 3. The long-run elasticity coefficient δ.

Country	G total	CF01	CF02	CF03	CF04	CF05	CF06	CF07	CF08	CF09	CF10
Greece	1.02*	-1.50*	1.43*	4.20**	0.88**	0.58	1.19**	0.76**	2.69*	2.07**	0.78**
	(0.06)	(0.27)	(0.55)	(0.32)	(0.14)	(0.01)	(0.23)	(0.01)	(0.30)	(0.15)	(0.09)
Spain	-0.06	-0.65**	0.74**	0.81**	1.23**	1.37**	-0.20	1.94**	0.98**	2.85*	0.91**
	(0.13)	(0.14)	(0.09)	(0.07)	(0.09)	(0.07)	(0.32)	(0.33)	(0.10)	(0.93)	(0.01)
Ireland	0.36*	1.38**	0.55**	0.14	0.56**	0.13	1.11**	1.20**	0.79**	2.46**	0.86**
	(0.15)	(0.21)	(0.01)	(0.14)	(0.08)	(0.59)	(0.09)	(0.05)	(0.09)	(0.61)	(0.01)
Italy	0.94**	-1.97**	1.36*	3.13**	0.77**	1.66**	0.58**	2.37**	1.96**	0.78**	0.88**
	(0.01)	(0.18)	(0.62)	(0.41)	(0.01)	(0.18)	(0.00)	(0.27)	(0.21)	(0.00)	(0.14)
Portugal	2.34**	0.77**	0.64*	0.68**	0.73**	-0.22**	0.58**	2.55**	0.63**	0.77**	0.89**
	(0.40)	(0.01)	(0.0)	(0.02)	(0.00)	(0.72	(0.01	(0.25)	(0.00)	(0.00)	(0.02)
Austria	0.67**	-0.01	-0.31**	0.76**	1.29**	0.88**	-0.72**	0.73**	0.47	0.79**	0.88**
	(0.05)	(0.08)	(0.08)	(0.06)	(0.33)	(0.13)	(0.18)	(0.23)	(0.31)	(0.01)	(0.00)
Belgium	0.93**	-0.58**	-0.58**	1.64**	1.70**	-0.98	1.77**	1.66**	2.45**	0.99**	0.95**
	(0.13)	(0.03)	(0.03)	(0.05)	(0.19)	(0.68)	(0.27)	(0.12)	(0.21)	(0.07)	(0.10)
Germany	0.61**	0.40**	-0.30	0.74**	0.90**	-1.56**	0.46**	1.57**	0.99**	0.59**	-1.07*
	(0.12)	(0.12)	(0.26)	(0.12)	(0.05)	(0.36)	(0.08)	(0.09)	(0.18)	(0.11)	(0.40)
Denmark	0.25	-0.91*	0.70**	1.27**	-0.78*	-1.81*	-1.15*	2.27**	1.22**	0.98*	0.06
	(0.15)	(0.31)	(0.00)	(0.16)	(0.35)	(0.89)	(0.40)	(0.41)	(0.09)	(0.09)	(0.28)
Finland	0.79**	0.75**	0.48*	0.85**	-0.07	0.52**	- 0.53	1.60**	0.59**	0.77**	0.60**
	(0.15)	(0.16)	(0.20)	(0.05)	(0.23)	(0.00)	(0.29)	(0.18)	(0.06)	(0.06)	(0.09)
France	1.08**	0.33**	0.72**	1.40**	0.77**	0.69**	0.73**	1.50**	0.71**	0.84**	0.94**
	(0.05)	(0.07)	(0.00)	(0.08)	(0.00)	(0.01)	(0.00)	(0.07)	(0.01)	(0.07)	(0.01)
Luxembourg	0.85**	0.72**	1.50	1.27**	0.63**	0.56**	0.18*	0.90**	0.64**	0.89**	0.89**
	(0.04)	(0.01)	(1.22)	(0.11)	(0.21)	(0.04)	(0.09)	(0.07)	(0.01)	(0.03)	(0.03)
Netherlands	2.71*	-2.10*	0.68**	1.93**	0.78**	1.72**	-1.19**	0.89**	1.31**	1.29**	0.85*
	(0.81)	(0.63)	(0.00)	(0.07)	(0.00)	(0.23)	(0.35)	(0.04)	(0.16)	(0.04)	(0.00)
Sweden	-0.55**	-0.34*	-0.59*	0.71**	1.04**	3.46**	0.67**	1.33**	0.18**	0.90**	0.69**
	(0.19)	(0.15)	(0.19)	(0.00)	(0.16)	(0.39)	(0.01)	(0.06)	(0.32)	(0.05)	(0.07)
United Kingdom	1.35**	0.05	1.36**	1.47**	0.86**	2.53**	4.80**	1.84**	1.47**	1.96**	0.99**
	(0.25)	(0.43)	(0.37)	(0.12)	(0.04)	(0.17)	(1.24)	(0.11)	(0.14)	(0.12)	(0.13)
Average	1.17	1.26	0.95	2.20	0.84	1.08	0.86	1.77	1.41	1.79	0.87
Share significant	87%	87%	93%	93%	93%	80%	87%	100%	93%	100%	93%

Note: Symbols *and ** and denote significance at the 1% and 5% level, standard deviation are in parenthesis. Average means average absolute values of significant coefficients only. Share significant means share of significant cases.
Source: authors´ calculations.

We also analyzed the short-term elasticity and Table 4 summarizes findings about the short-run elasticity of government expenditure with respect to output. In this case, the results and conclusions for the short-run elasticity are not so unequivocal. The short-run elasticity is positive for 48% of statistically significant cases in the sample, with a mean coefficient above unity. It´s needed to points out on 35% statistical significant of results only. The statistical significance is the highest for social protection (60%) what it is important because of its share on total government expenditure.

Table 4. The short-run elasticity coefficient δ.

Country	G total	CF01	CF02	CF03	CF04	CF05	CF06	CF07	CF08	CF09	CF10
Greece	-0.54	2.34*	5.97*	4.23*	0.96	1.92*	0.96	3.45*	-4.02	0.12	0.47
	(1.14)	(0.83)	(2.07)	(2.36)	(1.73)	(0.80)	(1.38)	(1.33)	(2.56)	(1.62)	(0.62)
Spain	1.21**	1.01*	0.19	2.11*	-0.29	-0.65	0.38	0.79*	-0.29	0.89**	1.21*
	(0.21)	(0.54)	(0.34)	(1.10)	(0.76)	(0.88)	(2.28)	(0.33)	(1.24)	(0.22)	(0.51
Ireland	-0.20	-0.63	0.83*	1.39*	1.11	1.43*	-1.65	-1.25*	2.92*	0.55*	-1.44*
	(0.70)	(0.39)	(0.31)	(0.48)	(4.68)	(0.60)	(1.52)	(0.49)	(1.50)	(0.15)	(0.58)
Italy	0.44*	1.05*	-0.43	0.18	0.52	0.64	-0.35	-0.55	1.14*	0.60*	-0.67**
	(0.23)	(0.50)	(0.77)	(0.89)	(1.53	(0.38)	(5.01)	(0.36)	(0.55)	(0.27)	(0.22)
Portugal	0.07	-0.69*	1.00	-2.63*	0.49	0.19	4.38*	1.13*	0.49	0.42	-1.34*
	(0.35)	(0.14)	(0.76)	(1.24)	(1.14)	(0.91)	(1.30)	(0.57)	(0.84)	(0.88)	(0.69)
Austria	-0.91*	0.02	1.45*	-0.11	-2.85	-1.92*	-2.16*	-0.37	0.76	0.32	-0.26
	(0.41)	(0.44)	(0.54)	(0.35)	(2.35)	(0.83)	(1.01)	(0.81)	(0.80)	(0.37)	(0.24)
Belgium	-0.14	0.79	-0.15	-0.79*	-1.54	-0.49	0.89	0.21	-1.01	-0.05	-0.23
	(0.34)	(0.47)	(0.39)	(0.33)	(1.62)	(0.68)	(1.87)	(0.51)	(0.95)	(0.26)	(0.22)
Germany	-0.55	-0.12	0.01	-0.17	-0.33	0.28	-0.63	-0.77	-0.28	-0.34	-0.34
	(0.51)	(0.23)	(0.33)	(0.14)	(4.72)	(1.44)	(0.67)	(0.45)	(0.37	(0.26	(0.30
Denmark	-0.40	0.09	1.04	-0.26	-0.67	0.64	2.33	-0.05	0.13	-0.81*	-0.66*
	(0.21)	(0.40)	(0.70)	(0.35)	(0.40)	(0.86)	(1.46)	(0.27)	(0.50)	(0.28)	(0.26)
Finland	-0.17	-0.15	-0.16	-0.24	-0.53	0.82*	-0.04	0.12	-0.56*	-0.14	-0.80**
	(0.17)	(0.34)	(0.35)	(0.31)	(0.49)	(0.31)	(0.69)	(0.19)	(0.32)	(0.22)	(0.24)
France	-0.21	0.88*	-0.14	-0.90	-0.06	0.30	1.65*	-0.02	-0.08	0.04	-0.46**
	(0.17)	(0.41)	(0.58)	(0.57)	(0.35)	(0.65)	(0.66)	(0.28)	(0.03)	(0.25)	(0.18)
Luxembourg	-0.34*	-0.66	-0.85*	-2.17	-0.35	-0.17	-0.52	-0.08	-0.47	-0.47*	-0.50*
	(0.19)	(0.44)	(0.43)	(1.27)	(0.35)	(1.02)	(0.42)	(0.33)	(0.50)	(0.17)	(0.14)
Netherlands	0.35	-0.58	0.75	0.07	-6.05*	-0.07	1.63	0.09	-0.41	-0.65*	0.55*
	(0.25)	(0.52)	(0.48)	(0.39)	(2.08)	(0.34)	(5.91)	(0.85)	(0.67)	(0.26)	(0.19)
Sweden	-0.19	0.28	-0.08	-0.10	-1.10*	0.86	-0.11	-0.18	-1.18	-0.20	-0.00
	(0.17)	(0.69)	(0.60)	(0.41)	(0.52)	(1.70)	(0.77)	(0.32)	(1.47)	(0.36)	(0.26)
United Kingdom	-0.21	-1.64*	-0.46	0.06	3.70	-3.07**	-0.33	-0.72*	0.06	-0.27	-0.18
	(0.41)	(0.70)	(0.46)	(0.34)	(2.30)	(1.35)	(1.07)	(0.39)	(0.49)	(0.33)	(0.25)
Share significant	27%	40%	33%	40%	20%	40%	20%	40%	27%	40%	60%

Note: Symbols *and ** and denote significance at the 1% and 5% level, standard deviation are in parenthesis. Share significant means share of significant cases.
Source: authors´ calculations.

The coefficient value above one is consistent with the voracity hypothesis, as it suggests that in response to a given shock to real GDP, government expenditure rises by even more in percentage points. Although findings include the short-run elasticity coefficient *β* complying with the above condition, voracity effect cannot be verified by reason of a very low statistical significance.

4. Conclusion

The aim of this paper was to examine the trends of government expenditure in the core member states of the European Union in a period 1995-2010 and provide direct empirical evidence on cyclicality and the short-term and the long-term relationship between government expenditure and output. We analyzed annual data on government expenditure in compliance with the COFOG international standard. Total government expenditure amounted to 48% GDP of EU15 in average during analyzed period. Two thirds are devoted to social protection, health and general public services. The other functions of government expenditure mainly concern education and economic affairs. The remaining

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functions, namely defense, public order and safety, environmental protection, housing and culture, represented in average 12.5% of EU15 total expenditure only. But results express significant differences in size and importance of public sector in the EU15 member states.

Although the theory suggests that government expenditure is countercyclical, our research does not prove that. We used Johansen cointegration test and the error correction model. The results confirm cyclical development of government expenditure on GDP and Wagner´s law. Output and government expenditure are cointegrated for at least six of the expenditure functions in EU15 member states and it implies a relationship between government expenditure and output. This contrasts with the existing empirical literature, which generally provides weak support for Wagner's law and cyclical development in developed countries. As expected, the adjustment coefficient γ is mostly negative (in 96% of significant cases) and it indicates dynamic stability. The government expenditure functions are procyclical in most countries (77% cases in the sample). Average value of a long-run elasticity coefficient is 1.30 for all expenditure functions, 1.17 for total government expenditure. It is consistent with the narrow interpretation of Wagner's law and it indicates that the public sector is increasing in relative importance in the long-term. Results varied across member states and categories but the long-run elasticity coefficient δ was significant for Health (CF07) and Education (CF09) in a whole EU15. That means that the long-run relation between health and education government expenditure and output exists in all EU15 member states.

The short-run relationship between expenditure and output was also analyzed. Results are not unambiguous due to a relatively low statistical significance (35%). Findings also include the short-run elasticity coefficient β above one what is consistent with the voracity hypothesis, but voracity effect cannot be verified because of a very low statistical significance.

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PRO-INNOVATION POLICY IN THE COUNTRIES OF CENTRAL & EASTERN EUROPE

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Abstract. The aim of the article is an attempt to indicate which actions of the state affect the innovativeness of the economy. The Author posed the hypothesis that there was a significant dependence between the state budget expenditure on R&D and the level of innovativeness in a given country. The article consists of two principal parts: the theoretical and empirical ones. The first step towards the attainment of the aim was the construction of a theoretical model indicating the directions of the pro-innovation policy of the state. In the empirical part, an attempt was made to verify the theoretical assumptions with respect to the Member States in Central and Eastern Europe (CEE) which constitute a group of so-called "new" members of the Community. The theoretical part was based on the literature studies, whereas in the empirical part use was made of the reports on research on innovativeness in the particular countries in Central and Eastern Europe and the results of own studies.

Keywords: policy, pro-innovation policy, innovation, European Union, Central & Eastern Europe.

JEL Classification: O11.

1. Introduction

In its present composition, the European Union consists of 27 states with very varied economic potential. The article is concerned with the pro-innovation policies of the Member States of the European Union situated in the region of Central and Eastern Europe, i.e. Lithuania, Latvia, Estonia, Poland, the Czech Republic, Slovakia, Hungary, Romania, Bulgaria and Slovenia. In the rankings of the innovativeness of economies, most of these countries are far behind the economically developed countries in Western Europe. One of the main reasons for such a situation should be discerned in state policy.

The main aim of the article was an attempt to indicate which actions of the state affect the innovativeness of the economy. The Author posed the hypothesis that there was a significant dependence between the state budget expenditure on R&D and the level of innovativeness in a given country. In order to attain this aim, it was necessary to create a theoretical model indicating these actions and, subsequently, to empirically verify the major directions of these actions on the basis of the reports concerning research on innovativeness in Central and Eastern European countries. Both parts are coupled by the presentation of the results of primary studies to assess state policy in terms of how it fosters of the development of innovativeness at companies in the case of a selected country in Central and Eastern Europe.

For the purposes of the implementation of the objectives and verification of the hypothesis, the method of literature analysis as well as primary and secondary sources were used. The most impotent secondary reports were those based on questionnaire surveys carried out by the leading centres: Eurostat, OECD and the World Economic Forum.

2. Research problems and objectives and the methodology applied

The state has at its disposal many instruments which affect the innovativeness of the national economy. The state can pursue pro-innovation policy or its actions may contribute to the impeding of innovation processes in the economy. Therefore, the state seems to play a significant role in the field of innovativeness of the economy. In this context, the following research problems can be identified:

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- Which factors/elements make up the innovation policy of a state which is a member of the European Union?
- How can the innovativeness of the economies of particular countries be measured?
- How can such innovativeness be compared?
- Which of the international studies and reports on innovativeness present it in the most comprehensive manner?
- What are the reasons for the relatively low innovativeness level in Central and Eastern European countries when compared with the other Member States of the European Union?
- What is the cause of the differences in the innovativeness level among the economies of particular countries?

In relation to the highlighted problems, the main research goal was formulated, which was an attempt to indicate which actions of the state affect the innovativeness of the economy, with particular consideration given to the states of Central and Eastern Europe. In order to attain the main goal, the following detailed objectives were set out:

- the construction of a model of the pro-innovation policy of the state,
- analysis of reports concerning research on the innovativeness of the economies of the particular countries,
- comparison of the innovativeness level of the particular Member States of the European Union,
- an indication of the major indicators defining the economic innovativeness of the Central and Eastern European countries and the demonstration of the reasons for its low level when compared with the other Member States of the European Union,
- an assessment of the state policy in terms of its fostering the development of innovativeness at companies in the case of a selected country in the region of Central and Eastern Europe,
- the demonstration of the reasons for the low inventiveness level in Central and Eastern European countries against the background of the other Member States of the European Union.

The Author posed the hypothesis that there was a significant dependence between the innovativeness of the economies of the Central and Eastern European countries and the state budget expenditure on R&D.

In order to attain the specified objectives and to verify the proposed hypothesis, the method of literature analysis and the results of secondary research were used, with particular consideration given to reports on innovativeness prepared by recognised international institutions. The major sources from which the results were acquired included the Global Competitiveness Report, the Community Innovation Survey prepared by Eurostat and the reports of the OECD (Organization for Economic Co-operation and Development).

The World Economic Forum carries out research and prepares competitiveness analyses, elaborating the Global Competitiveness Index (GCI) serving to measure the competitiveness of the national economies, based on micro- and macroeconomic measurements of national competitiveness. 12 pillars of economic competitiveness were adopted, including innovation.

The research on innovativeness and competitiveness of the world economy and the particular states is also carried out by the OECD, as well as by the independent centre IMD International (IMD, 2008), where annual reports are drawn up in cooperation with the leading academic economic centres. An important research area discussed in the reports is the cooperation between science and business.

In turn, the growth of the European economy is analysed and employment is monitored by Allianz Economic Development and Research (The Lisbon Council, 2008) and the European Commission. The Allianz ED&R report is prepared for 15 Western European countries and Poland (The Lisbon

Council, 2008). The research covers: economic growth, productivity growth, education, jobs, investment activity, sustainability of public finances and the overall score.

The Innovation Sector Index was developed to measure the innovativeness of selected sectors of the economy. The method based on 12 indicators was devised by the European Commission, OECD and Eurostat.

It is particularly important to note the research done by the Eurostat, which consists of questionnaire surveys prepared in accordance with unified methodology and designed to collect data on innovativeness throughout the European Union in a manner enabling the comparison of the results obtained for the particular countries.

3. The construction of the model of the pro-innovation policy of the state

The concept of "policy" comes from the Greek word "politike" and means the art of governing the state (Grzywacz, 1995). Instruments of the direct influence of the state on the innovativeness of the national economy include e.g. grants and financial reliefs. However, it should be recognised that most of the activities carried out by the state with respect to enterprises, which may affect their innovativeness and the innovativeness of the entire economy are of an indirect nature.

Innovation policy is part of the overall policy of the particular states and depends, in particular, on foreign and economic policies. Each state adopts separately legal acts which are binding for economic entities operating on a given market.

A model representing in a systemic manner the pro-innovation policy of the state.
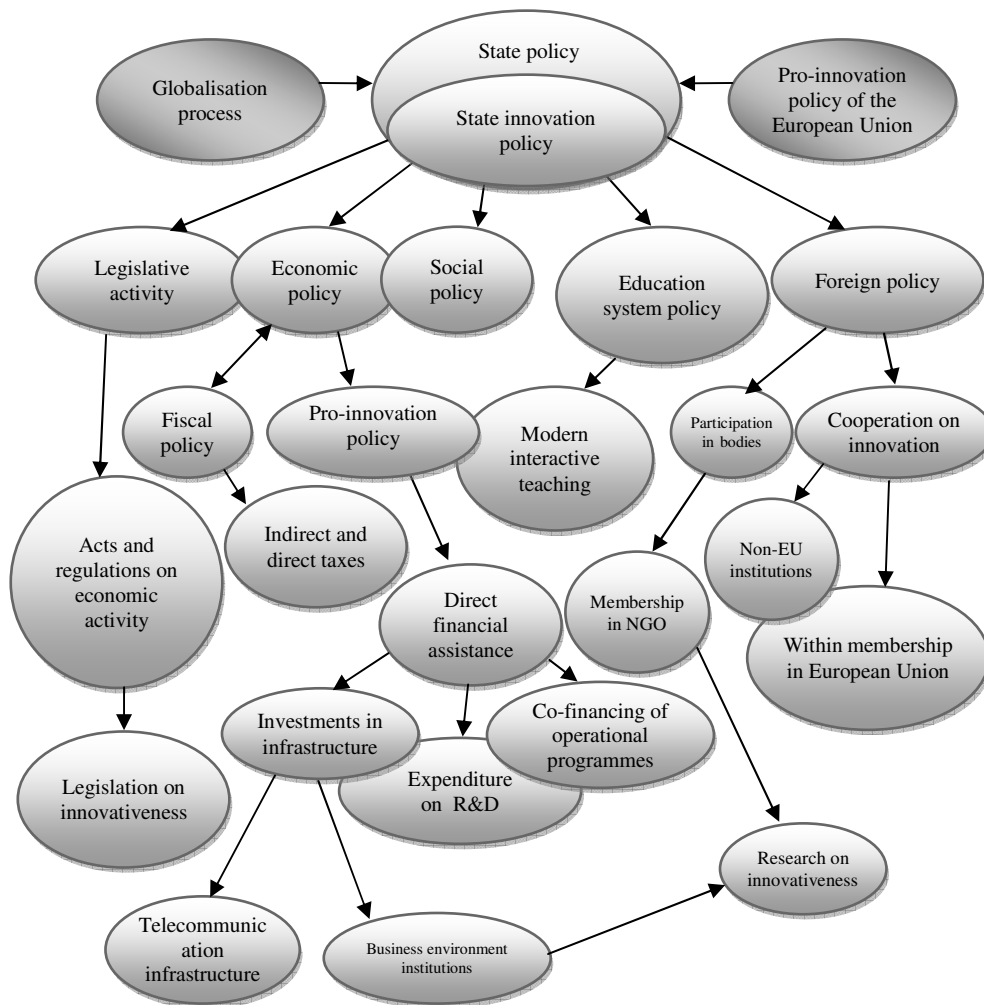
The following abbreviations are used in the figure: NGO – non-governmental organizations, EU – the European Union, R&D – research and development.
Fig. 1. Pro-innovation policy of the state (Source: the author's own study).

All the factors listed here can affect the innovativeness of enterprises, particularly in the countries which are at the stage of economic growth and consolidation of democratic structures. The pro-innovation policy of the state can consist of many elements which affect one another. In the figure, arrows indicate the major directions of the influence exerted by the particular factors, marking the interacting areas by partly superimposing them on each other.

In this system, the most important factors in the pro-innovation policy of the state include:

- the global conditions of the innovation activity and, in the case of the Member States of the European Union, mainly the pro-innovation policy of the European Union,
- the legislation concerning the economic activity and, in particular, the simplification of administrative procedures, e.g. the reduction of the time needed to set up a company,
- fiscal burdens on entities carrying out economic activities,
- telecommunications infrastructure in the country,
- budget expenditure on R&D,
- the impact of human capital on the innovativeness of the economy and the capacity to improve its quality through investment in the education system, in particular the higher education system.

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With varied strength, these factors can affect the innovativeness of enterprises; this is particularly important in the countries which are at the stage of economic growth and consolidation of democratic structures, i.e. the Central and Eastern European countries.

4. The pro-innovation policy of the European Union

By its assumption, the European Union policy is expected to foster the introduction of innovation at enterprises. In its innovation policy, the European Union focuses on three areas:

- the consistency of the European cooperation in the field of science and technology,
- the international dimension of projects,
- the regional aspect of these projects.

The main instruments of innovation policy include: the Lisbon Strategy, the implementation of the concept of knowledge-based economy (KBE), the Structural Funds and the identification of the level of economic innovativeness in the Member States.

Private enterprises, which in the context of European integration depend to a large extent on this policy, should be recognised as the main driver of the innovativeness of the economy. The major instruments of innovation policy which affect the activities of institutions in the European Union, including enterprises, are shown in Fig. 2.
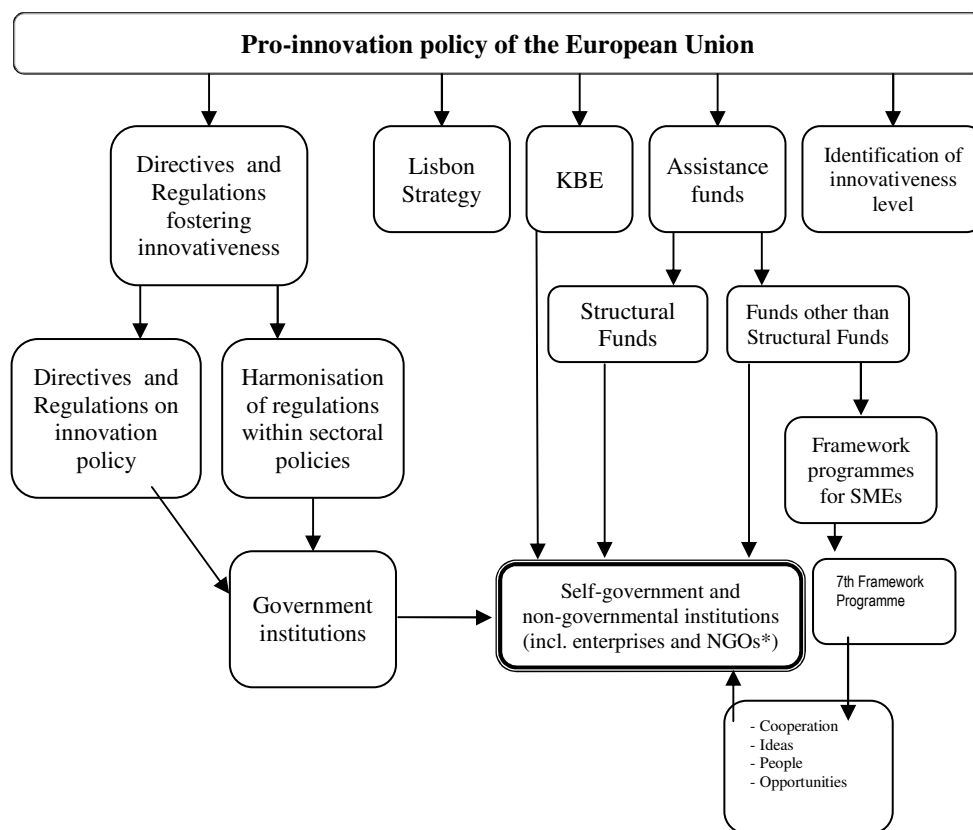
*NGO – non-governmental organisation
Fig. 2. Instruments of the innovation policy of the European Union (Source: author's own study).

In certain areas, the pro-innovation policy of the European Union exerts its direct impact on non-governmental institutions; in particular, on self-government units and enterprises. This is mainly the case with legislation, assistance funds and the knowledge-based economy. The dominant importance of knowledge and the fact that it replaces capital in the classical meaning of the term provide the basis for general opinions that a new economic order, defined as the knowledge-based

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economy, emerges. In a recent dozen years or so, this type of economy emerged as an important field of theoretical thought and political activities on the global, continental, national and regional scales. According to D. Foray, the knowledge-based economy is such economy where the ratio between the number of employees using knowledge and the total number of employees is high, while the information sector has a decisive effect on the functioning of the economy; moreover, this is an economy where the intellectual capital prevails over fixed capital with respect to the total market capital (Foray, 2004).

Along with the assumptions of the 5[th], 6[th] and 7[th] Framework Programmes, the Lisbon Strategy is the basic instrument for implementing the strategy designed to assist the transformation of the European Union economy into the most innovative economy in the world (Runiewicz-Wardyn, 2008). The innovation and research and development (R&D) activities are expected to lead to the achievement of the abovementioned strategic goal. *The assumptions of the Lisbon Strategy have not been achieved,* since 2000 the European Union has not only failed to reduce the gap with respect to the USA, but has also increased it (Runiewicz-Wardyn, 2008). The European Commission recognised that the incompletely satisfactory level of innovation activity was one of the basic reasons for the poor productivity growth in the countries of the European Union, not only with respect to the USA and Japan, but also several other non-European countries; hence, the research on its development capacity is so important.

Regional policy is quite significant for innovativeness at enterprises. This was researched by Pitts, Wigier and Szczepaniak (2004), demonstrating that the level of innovativeness (mainly technological innovativeness) at enterprises in selected regions of Europe (two regions per country in Belgium, Ireland, Portugal, Great Britain and Italy, and one region in France) depends to a large degree on the pro-innovation regional policy of the territorial self-government units.

Despite the economic slowdown related to the economic crisis in 2008-2009, the European industry continues to focus on activities designed to develop new, promising solutions. Their effective implementation not only depends on the identification of the potential of emerging technologies, but also the strategies and methods for the development of innovation activity and the appropriate management of intellectual property are of primary importance. According to Frost & Sullivan, a global advisory company, the appropriate use of innovation is the key to the development of industry in the region of Central and Eastern Europe.

The Innobarometer 2010 (European Commission, 2011a), was dedicated to the innovation in the public sector. In February 2011, the European Commission published the Innovation Union Scoreboard for 2010. The document presented the situation in the EU in the field of innovation versus its major competitors and provided a general picture of the innovativeness level in the particular countries of the EU.

In 2011, the Innovation Union Scoreboard (IUS) replaced the European Innovation Scoreboard (EIS) which had been used earlier. The information contained in the Scoreboard is to constitute a source of information on the weaknesses and strengths of the particular Member States in the field of innovation.

The IUS for 2010 was elaborated on the basis of the analysis of 25 indicators in the scope of scientific research and innovation (European Commission, 2011b). The research used indicators and investigated trends in innovativeness for 27 Member States and for: Croatia, Serbia, Turkey, Norway, Switzerland, the Former Yugoslav Republic of Macedonia and Iceland. All the indicators were divided into three categories:

- "enablers" represent the basic elements which make it possible for innovation to occur (human resources, financial resources and research systems);
- "firm activities" define the degree of innovativeness at enterprises (investments, linkages and entrepreneurship, and intellectual assets);

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- "outcomes" demonstrate the benefits from innovation for the economy (innovators, economic effects).

In accordance with their results, all the surveyed countries were divided into four groups:

- the innovation leaders, i.e. the countries whose performance is well above the average for the entire European Union (Denmark, Finland, Germany and Sweden);
- the innovation followers include the countries which show a performance close to the average for the European Union (Austria, Belgium, Cyprus, Estonia, France, Ireland, Luxembourg, Netherlands, Slovenia and the United Kingdom);
- the moderate innovators are a group of states whose performance is below the average (Czech Republic, Croatia, Greece, Hungary, Malta, Poland, Portugal, Slovakia, Spain and Italy);
- the modest innovators, i.e. the countries representing the innovation performance well below the EU average (Bulgaria, Latvia, Lithuania, Romania).

The Commission presented a report on the status of innovation in Europe and an analysis of progress made by the Member States, according to which the status of innovation in many areas is far from desirable, as shown in the report of the European Commission on the "Innovation Union" project (*Innovation Union Competitiveness Report 2011*). The report contains an analysis of strengths and weaknesses of the national research and innovation systems and a review of hard facts providing the basis for the launch of deliberate decisions to determine the policy of each state. The report was based on the Union Innovation Scoreboard. Moreover, it contained information consisting of data on the performance of the individual countries in the scope of scientific research and innovation. One of its conclusions is that Europe needs substantially greater and smarter expenditure on technology research and development, both in the public and private sectors, which will enable not only a radical acceleration in a short term, but will also generate a counter-cyclic effect at the time of a crisis.

5. Selected instruments of the pro-innovation policy of the states of Central and Eastern Europe

The countries of Central and Eastern Europe have only just embarked on a path of dynamic development. This opinion has been confirmed by the results of the research carried out by several independent centres. This has been pointed out by the Global Competitiveness Reports, drawn up annually by the World Economic Forum (2010). In the Global Competitiveness Index (GCI) presented in the most recent Global Competitiveness Report 2010-2011 (GCR), most countries of Central and Eastern Europe were assessed as relatively dynamically countries in the period of transformation, aiming to catch up in its economic development level with the countries that lead in the world. According to the results presented here, most countries of Central and Eastern Europe belong to a group of economies in the course of transition from stage 2 to 3. Among the most competitive countries in economic terms, such as the USA, Japan or Australia, the latter group included two states from the region in question, i.e. the Czech Republic and Slovenia. In turn, the group of countries at a lower competitiveness level (Group 2) consists of Bulgaria, Romania and Serbia. A feature which distinguishes economies at the highest competitiveness level is the intensity of expenditure on activities in the field of R&D, the high level of innovativeness, the short production cycle of products and processes, a strategic discussion with other companies and research institutions. A general tendency can be seen among the new members of the European Union. It is increased employment in high tech industries, since in these states companies dependent on high technologies have only just embarked on the path of development, whereas, in general, in highly developed countries, i.e. the "old members" of the Union, employment falls in these groups of enterprises, mainly in favour of service companies. These tendencies are consistent with the expectations and the predicted directions of transformations in the structure of production and economy, as well as in the structure of employment in the transition to the knowledge-based economy.

Innovation is one of 12 pillars of competitiveness in the GCR Report. Among the 139 surveyed countries, those of Central and Eastern Europe usually take places in the first half of the ranking; however, certain economies were assessed as much more innovative. Selected results for the countries of Central and Eastern Europe are presented in Table 2.

Table 1. The positions of the countries of Central and Eastern Europe in the innovation ranking.

Country	Rank	Score	Rankings within Eastern Europe in the Global Competitiveness Index
Bulgaria	92	2.91	71
Czech Republic	27	3.92	36
Estonia	37	3.68	33
Hungary	41	3.55	52
Latvia	77	3.02	70
Lithuania	51	3.38	47
Poland	54	3.31	39
Romania	87	2.94	67
Slovakia	85	2.95	60
Slovenia	34	3.73	45

Source: author's own study based on Schwab (2010), World Economic Forum (2010).

The presented data define the position of particular countries in the innovation rankings and their position in the overall competitiveness ranking. On the basis of the results presented, it can be noted that two countries from Central and Eastern Europe lead the other countries assigned to this group. They are Estonia and the Czech Republic, which take, respectively, the 33rd and 36th positions in the ranking. In turn, in this scope of innovation, three outstanding countries can be indicated; they are Slovenia, the Czech Republic and Estonia.

In accordance with the Report, economic competitiveness is based on 12 pillars, including innovation performance defined in turn by the following indicators:

- Capacity for innovation – in your country, how do companies obtain technology (1 = exclusively from licensing or imitation foreign companies, 7 = by conducting formal research and pioneering their own new products and processes),
- Quality of scientific research institutions – how would you assets the quality of scientific research institutions in your country? (1 = very poor, 7 = the best in their field internationally),
- Company spending on R&D – to what extent do companies in your country spend on R&D? (1 =do not spend on R&D, 7 = spend heavily on R&D),
- University-industry collaboration in R&D – to what extend do business and universities collaborate on research and development (R&D) in your country (1 = do not collaborate at all, 7 = collaborate extensively),
- Government procurement of advanced tech products – do government procurement decisions foster technological innovation in your country (1 = no, not at all, 7 = yes, extremely effectively),
- Availability of scientists and engineers – to what extent are scientists and engineers available in your country (1 = not at all, 7 = widely available),
- Utility patents per million population – number of utility patents (e.g. patents for invention) granted in 2009 per million population in 2009; utility patents are recorded such that the origin of the patent is determined by the first-named inventor at the time of the grant.

The range of the indicators proposed in the Report for innovation performance was extended with another indicator from the 9th pillar "Technological Readiness"; specifically: Availability of latest technology (the question was: to what extent are the latest technologies available in your country? 1 = not available, 7 = widely available).

Table 2. The innovation performance indicators for the states of Central and Eastern Europe.

Country	Capacity for innovation rank/score	Quality of scientific research institutions rank/score	Company spending on R&D rank/score	University-industry collaboration in R&D rank/score	Government procurement of advanced tech products rank/score	Availability of scientists and engineers rank/score	Utility patents per million population rank/score	Availability of latest technology rank/score
Bulgaria	79/2.8	73/3.5	96/2.7	110/3	87/3.4	77/4	31/4.8	100/4.3
Czech Republic	24/4.1	21/5.1	26/4	29/4.5	31/4.2	50/4.4	34/4.2	46/5.5
Estonia	34/3.6	26/4.7	46/3.3	36/4.2	43/4.1	58/4.2	40/2.3	31/5.8
Hungary	46/3.4	18/5.2	75/3	32/4.3	106/3.2	48/4.4	32/4.6	47/5.5
Latvia	57/3.1	61/3.8	94/2.7	73/3.5	111/3.1	98/3.6	41/2.3	66/5.1
Lithuania	48/3.3	40/4.2	57/3.1	35/4.2	104/3.2	51/4.4	55/0.9	37/5.6
Poland	50/3.3	47/4.1	61/3	64/3.6	61/3.7	60/4.2	54/0.9	86/4.7
Romania	72/2.9	83/3.3	103/2.7	103/3.1	105/3.2	55/4.3	62/0.4	99/4.3
Slovak Republic	69/2.9	90/3.3	68/3	87/3.3	127/2.7	71/4	44/1.9	40/5.6
Slovenia	22/4.2	27/4.7	32/3.7	37/4.2	64/3.7	73/4	27/11	38/5.6
Sweden	3/5.7	5/5.9	1/6	5/5.5	13/4.5	3/5.8	8/110.2	1/6.8
Denmark	9/4.9	12/5.5	7/5.2	8/5.3	9/4.6	19/5.1	15/70.9	13/6.4
Germany	1/5.9	6/5.9	4/5.7	9/5.2	32/4.2	27/4.8	9/109.5	17/6.3
USA	6/5.3	4/6	6/5.4	1/5.8	5/4.7	4/5.7	3/361.7	7/6.4
France	8/5.1	19/5.2	13/4.7	44/3.9	48/4	12/5.3	21/50.4	16/6.4

Source: author's own study based on Schwab (2010), World Economic Forum (2010).

The majority of the Member States of the European Union which belong to the macro-region defined as Central and Eastern Europe are substantially different in their innovation performance from the most innovative world economies, with the leading countries including Sweden and the USA. The economies which lead in the world also include Germany, Denmark and France. However, the group of the states in question is very differentiated and in terms of innovation performance such countries as Slovenia, Estonia or the Czech Republic are significantly ahead of the other economies, from which, in turn, Romania and Bulgaria are greatly different. Both countries acceded to the European Union as the last ones and also represent the lowest level of economic development. The greatest differences can be seen for the indicator of the number of patents per million population in a given country. Compared with the United States, the third largest world superpower in this respect, following Taiwan and Japan with 361.7 submitted patents per million population, the countries of Central and Eastern Europe have performed very poorly. The largest number of patents has been submitted in Slovenia (11), Bulgaria which comes next can only boast of 4.8 patents per million population, although when compared with Romania (0.4) or Poland and Lithuania (each 0.9) this result seems to be a great success. However, in certain areas the differences do not seem to be so significant, as e.g. in the case of the indicator "availability of latest technology".

In the light of the insufficient level of competitiveness and innovativeness of the European economy when compared with the USA and Japan, the present challenges of innovation policy in the European Union primarily relate to the overall change in the presentation of innovation. The available data indicate sharp differences in innovation performance between the new and old EU Member States. Many weaknesses are common, e.g. the unwillingness to take risks, the low level of entrepreneurship or the inadequate investment in the field of R&D. This only concerns the new Member States, mainly the countries of Central and Eastern Europe. They include the lack of coordination between innovation policy and other policies, the lack of financial resources for the implementation of innovation, the absence of educated managers and employees (Janasz, 2005). The poor innovation performance of the Member States of the European Union impedes in practice their economic and social development.

The integration with the European Union does not yet lead to an acceleration of the rate of economic growth, but this growth can be seen in all the countries seeking to accede to the EU and in the countries which have already joined it. However, some economists (Filipczuk, 2007) note that globalisation and integration can pose some risks for the countries which have not a fully developed and consistent innovation system. Therefore, great hopes are associated with the implementation of the idea of the knowledge-based economy which is implemented in all the Member States.

The literature documents that the main reason for the low innovation performance of the countries of Central and Eastern Europe is the insufficient expenditure on the creation of knowledge, on the part of both enterprises and the state budget. Moreover, the structure of this expenditure is inappropriate, since the share of firms in it is too small. Therefore, it is important to overcome this development gap through new directions of research and the implementation of proposals which ensue from them, such as (Skawińska, 2007):

- drivers of regional development,
- management quality,
- public-private partnership,
- social partnership,
- the effectiveness of the use of Structural Funds,
- the role of public procurement, foreign investment, investment funds, the export of Polish foreign direct investments,
- motivation and the climate of social organisation.

The gap between the innovation performance in the countries in question and the most innovative European countries was confirmed by the comparative report of the European Commission concerning the innovation performance of the economies of the Member States: the *European Innovation Scoreboard* (European Commission, 2011c). According to the Report, they substantially lag behind the European innovation leaders, i.e. Sweden, Finland or Denmark, particularly in terms of the level of expenditure on R&D and the degree of cooperation between companies and science, although it should be noted that the results of the recent surveys cited above indicate significant progress in this respect.

In order to identify the major indicators which define the economic innovation performance of the countries of Central and Eastern Europe, the results of surveys on the following areas were used:

- the innovation performance of institutions,
- public expenditure on R&D,
- time required to start a business and the number of procedures required to start a business,
- fiscal burdens on entities carrying out economic activities,
- infrastructure,
- the level of science and education represented by two indicators, i.e. higher education and training as well as the number of researchers per labour force.

To give a fuller picture, Table 3 also shows the position of a given country in the innovation ranking and the level of GDP with respect to the EU average prior to the accession to the European structures and after its membership has become consolidated.

Table 3. Pro-innovation activities of the governments of the states of Central and Eastern Europe.

Country	Innovation performance in 2010 (rank)	Institutions rank/score	Public expenditure on R&D as % of GDP 2009	Number of procedures required to start a business /Time required to start a business	Infra-structure rank/score	Higher education and training (rank/score)	Researchers per thousands labour force	Development gap with respect to EU15 in 2003/2009**
Poland	54	54/4.18	0.48	6/32	72/3.76	26/5	3.8	43/55
Slovakia	85	89/3.60	0.28	6/16	57/4.19	53/4.49	4.7	48/66
Slovenia	34	50/4.37	0.68	3/6	36/4.83	21/5.27	6.8	73/80
Czech Republic	27	72/3.86	0.60	8/15	39/4.78	24/5.11	5.7	64/75
Estonia	37	31/4.91	0.76	5/7	32/4.94	22/5.17	5.7	47/58
Romania	87	81/3.74	0.29	6/10	92/3.44	54/4.47	2	27/42
Bulgaria	92	114/3.29	0.38	4/18	72/4.43	67/4.14	3.2	30/40
Lithuania	51	60/3.99	0.64	7/26	43/4.56	25/5.07	5.2	43/50
Latvia	77	75/3.79	0.29	5/16		35/4.81	3.8	38/47
Hungary	41	79/3.76	0.47	4/4	51/4.36	34/4.81	4.4	
EU			0.74				8.3	100

*GDP per capita in terms of PPP, EU = 100
Source: author's own study based onEuropean Commission (2011), Schwab (2010), World Economic Forum (2010).

The above table makes it possible to compare the activity of the states of Central and Eastern Europe in the scope of innovation policy in selected areas, such as science, expenditure on R&D, infrastructure or institutions with the position which a given state takes in the innovation performance ranking presented in the Global Competitiveness Report. Here, several dependences can be found to occur between the position in the ranking and certain variables. It seems that there is a certain (nonlinear) dependence between the level of budget expenditure on R&D and the position, since the states characterised by greater budget expenditure on this activity (0.6% of the GDP and more) take a much higher position in the ranking (from 27 to 37) than the more "economical" countries. This is the case with the Czech Republic, Slovenia and Estonia, but not Lithuania, which spends 0.68% of its GDP on R&D, but enjoys only the 51st place. In addition, it should be noted that, in general, the budget expenditure is much lower than indicated by the average for all the countries of the European Union, which is 0.74% of the GDP, apart from Estonia, which allocated 0.76% of its GDP for this purpose in 2009.

It can be noted that the level of the higher education and training (adult education) in the group of states in question was appreciated relatively highly in the competitiveness ranking, since 7 out of 10 took positions from 21 to 35. Another indicator concerning the same area, indicating the number of researchers per population, shows a large gap between the countries of Central and Eastern Europe and the developed countries of the European Union, since the average for the EU as a whole is 8.3 researchers per thousands labour force, against the average number of 4.53 researchers for the group of states in question. The country which leads the ranking, i.e. Slovenia (6.8), can boast of the highest number of researchers, whereas Romania has the least number of them at its disposal (2).

A large difference was noted in terms of the number of procedures required to start a business and time required to start a business, since in certain countries the principles of registration of activities and the related procedures are very simplified, as is the case with Slovenia and Hungary. In contrast, in other countries, such as Poland or Lithuania, it is more difficult to start a business. However, no relation between this factor and the level of innovativeness of the economy can be discerned, although there is no doubt that it diminishes its competitiveness.

It seems that institutions and infrastructure are the weakest link in the pro-innovation policy of the states of Central and Eastern Europe. It was already in the Global Competitiveness Report 2008-2009 that infrastructure and, subsequently, institutions were identified as the main innovation bottlenecks

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in the countries of Central and Eastern Europe. The most recent report demonstrates that this situation has not changed. Although the infrastructure is continuously modernised, these countries must make up for many decades of backwardness and underinvestment in the period of the Socialist economy. In turn, the activities of institutions, mainly public ones, seem to be an urgent issue for all the new Member States of the European Union, since their activities are one of the major factors which impede their economic innovativeness.

However, the potential of the countries of Central and Eastern Europe is appreciated by world-class economists. E.g., in the light of the surveys carried out by A. T. Kearney, the Economist Intelligence Unit and the Ernst & Young Company, certain of them belong to the world leaders in terms of investment attractiveness as the places for the pursuit of R&D activity. The analyses conducted by the report authors indicate that the location of projects of this type in these countries is determined by such strengths as: their intellectual potential, qualified human resources, relatively low labour costs, fast economic growth and a system of financial incentives. However, the assessment by domestic entrepreneurs operating on a given market seems to be most important, since they are the ones who mainly contribute to the building of the economic image of a given country. The tourism industry can be recognised as one of the best-developing sectors of the economy in the countries of Central and Eastern Europe, which can be a driver of innovation; therefore, the opinions of representatives of this sector concerning the pro-innovativeness of policy in a given country in the region in question are assessed below.

6. Conclusion

A friendly, development-oriented policy can substantially support the innovation activity of enterprises, whereas the absence of political stability, social unrest, the isolation policy or excessive fiscalism clearly impedes it.

The research goal formulated in the introduction, which was an attempt to indicate which actions of the state affect the innovativeness of the economy, with particular consideration given to the states of Central and Eastern Europe, was achieved. The built model, representing a systemic approach to the pro-innovation policy of the state, served to guide the farther considerations based on empirical studies. The proposed hypothesis that the main barrier to the innovativeness of the economies of the Central and Eastern European countries was the low budget expenditure on R&D was not fully confirmed by surveys based on secondary sources, which were reports on the competitiveness and innovativeness of the European and world economies. It can be recognised that there is a certain (nonlinear) dependence between the level of budget expenditure on R&D and the level of inventiveness of the economy, since the states of Central and Eastern Europe characterised by greater budget expenditure on this activity (0.6% of the GDP and more) take a much higher position in the ranking (from 27 to 37).

Along with the results of surveys by international research centres and the opinions of other researchers and market observers, the own surveys conducted to identify the reasons for a low level of innovativeness in the states of Central and Eastern Europe make it possible to formulate certain general conclusions which may be helpful in shaping the future pro-innovation policy of these states:

- in general, the budget expenditure on R&D in the countries of Central and Eastern Europe is much lower than indicated by the average for all the countries of the European Union, which is 0.74% of the GDP, apart from Estonia, which allocated 0.76% of its GDP for this purpose in 2009;
- the level of the higher education and training (adult education) in the group of states in question was appreciated relatively highly in the competitiveness ranking, since 7 out of 10 countries took positions from 21 to 35; a low number of researchers per population still persists, since none of the countries of the Central and Eastern Europe, for which the average number is 4.53

researchers, has managed to achieve the average for the EU as a whole amounting to 8.3 researchers per thousands labour force;

- the number of procedures required to start a business and the time required to start a business hampered the development of entrepreneurship; in relation to these indicators, a large difference was noted among the particular countries, e.g. in Hungary and Slovenia the principles of registration of activities and the related procedures are very simplified, whereas in other countries, such as Poland or Lithuania, it can take several dozen days to start a business and a dozen or so documents may need to be submitted;

- entrepreneurs were relatively critical of the government activities in the scope of the pro-innovation policy of the state in one of the countries of Central and Eastern Europe, since the variation of the optimism indicator within the range of 0.5 clearly suggests that certain government activities should be reviewed and significant changes should be introduced, particularly in the scope of regulations and measures to facilitate the launch of investment projects by limiting the administrative procedures and improving infrastructure;

- institutions and infrastructure should be regarded as the weakest link in the pro-innovation policy of the states of Central and Eastern Europe; although the infrastructure is continuously modernised, the introduction of radical changes in the activities of institutions, mainly public ones, seems to be an urgent need for all the new Member States of the European Union;

- certain countries of the group in question belong to the world leaders in terms of investment attractiveness as the places for the pursuit of R&D activity, in the light of their intellectual potential, qualified human resources, relatively low labour costs, fast economic growth and a system of financial incentives;

- in all the countries of the European Union, particularly in those of Central and Eastern Europe, R&D investments must be improved, since the gap with respect to the leading competitors, such as the USA and Japan, is increasing, especially due to the relatively more modest R&D investments in the private sector;

- the countries which increase their expenditure on R&D can expect better prospects for overcoming the crisis;

- there is a need for smarter investments in the field of innovation, in accordance with the specialisation strategy recommended by the European Commission, combining supply-side measures (such as public grants for higher education, commercial R&D, venture capital and technological and research infrastructure) with demand-side measures (from public procurement in the field of innovative products and standardisation based on the principles of tangible effectiveness to the regulation of the market in a manner favouring competitiveness);

- the education of the top-class specialists must be adjusted to the needs of enterprises;

- all the Member States of the European Union should take greater efforts to implement the knowledge-based economy; it should be noted, however, that in accordance with the opinion of Eurostat, some of them, such as Austria and Denmark, have already made structural changes which have brought them closer to the model of an economy based on intensive use of knowledge.

It seems that we cannot speak of a consistent system of support for innovation in the particular Member States of the European Union which are assigned to group of Central and Eastern European countries, but rather of many directions of government activities. The institutions expected to support innovation in the particular Member States and the provisions of law applicable in this scope ensue to a greater extent from the adjustment of the economies of the new members to the requirements of the Internal Market rather than a planned government policy.

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CHALLENGES OF INTEREST RATE CONVERGENCE WITHIN THE EU MEMBER STATES

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Abstract. This study focuses on the interest rate convergence criteria in the light of the term structure interest rate theory. The paper encompasses an analysis of the interest rate dynamic in the EU, based on the correlation with other relevant macro-financial variables that are assumed to exert a fundamental impact upon. The study unveils that a period marked by an important economic growth would imply a higher interest rate and a commensurate liquidity cost. In this context, the application of an abundant liquidity policy would be inappropriate due to the liquidity trap. In the light of the new economic paradigm, determined by the recent financial turbulences, the Maastricht Treaty provisions concerning the interest rate policy appeared to be uncorrelated with the macroeconomic developments.

Keywords: term structure, interest rate, uncovered interest rate parity, convergence.

JEL Classification: E20, E52, E60, E61, E52.

1. Introduction

Convergence criteria determined a special focus on the interest rate dynamic; term structure theory, uncovered interest rate parity (UIP) and purchasing power parity (PPP) have acquired a new dimension in the light of the financial integration process. The CEE countries experienced floating rate regimes and current account liberalization prior to the integration in the European Union. This impacted to an important extent the evolution of macro-financial environment as well as the correlation with the business cycles of the developed countries. The interest rate is a connection layer with the worldwide financial system. Apart from its important position in the architecture of the convergence process, the interest rate consists of an important monetary policy instrument and a significant transmission mechanism.

The UIP brings forth the arbitrage opportunities that conducts to the similarities in terms of return corresponding to the comparable assets or liabilities denominated in domestic and foreign currencies. Testing this hypothesis is relevant for the purpose of market efficiency; speaking in real terms, it is likely for this hypothesis to be rejected since different factors might affect the foreign and domestic interest rate behavior.

This study concentrates on the dynamic of interest rates in the EU, with a special emphasis on the CEE countries. The interest rate convergence criterion is analyzed on a critical basis in the light of the term structure interest rate theory, having in mind the perspective of a premium risk conglomerate; this assembly of risk factors generates additional risk layers that lead to the positive trend of interest rate. The research shed light on the sources of additional risks at the country level, as well as on their joint evolution that could give incentive to potential groups of countries, with a similar interest rate dynamic.

The second part of the research enlarges the analytical perspective on the interest rate by the intermediary of the UIP; we test the UIP at the country level in Central and Eastern Europe, extending the area of analysis as for the main drivers impacting the interest rate dynamic. This study complements previous researches on the UIP (Rosenberg & Tirpak 2008, Brzoza-Brzezina et al. (2010), Filipozzi and Staehr, 2011); although the related literature is abundant in researches on the UPI, there are not many studies concentrated on Central and Eastern countries, especially in the light of the last years, marked by EU integration process and the outbreak of financial crisis. This paper is innovative due to the enlarged perspective on interest rate dynamic, that captures both term structure

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interest rate theory as well as UIP. In addition, we present empirical evidence on the evolution of various macro-financial variables that could explain the dynamic of interest rate.

The rest of the paper is organized as follows: the next section is dedicated to a brief literature review, the third section encompasses an empirical analysis of interest rate risk premiums while the last section is focused on the UIP.

2. Literature review

Literature on UIP is abundant in researches that either tested the efficiency degree of financial markets or revealed the various mutual relationships between interest rate and exchange rate. Different studies illustrated the UIP on various time periods, seeking to reveal the importance of time in explaining the accumulation of risks. Chinn & Meredith (2004), Mehl & Cappiello (2007) unveiled that UIP holds only for long periods of time (from five to ten years).

Lothiana & Wu (2011) made a research on a long period of time – 200 years- revealing that the UIP is validated only during some sub-periods of time. Other researches (Baillie & Bollerslev (2000), Flood & Rose (2002)) presented evidence that it is only after 1990 that UIP becomes relevant. Nevertheless, Chaboud and Wright (2005) uncovered that UIP holds on shorter time horizon in the context of speculation transactions. Bekaert et al. (2007) brought forth that UIP depends rather on foreign currency than on time horizon.

However, there are only a few papers that concentrated mainly on CEE economies, most of the studies being focused on the developed countries. Bansal & Dahlquist (2000) and more recently Alper et al. (2009) highlighted that UIP is confirmed especially in case of emerging countries, emphasizing the role played by the high inflation rate. Mansori (2003) and Horobet et. al (2009, 2010) pointed out that for the Central and Eastern countries, testing the UIP leads to results that vary from one country to the other. Although the hypothesis is confirmed by positive slope coefficients, the corresponding statistic tests do not validate it.

Recently, Filipozzi and Harkmann (2010) analyzed the UIP in the light of the recent financial turbulences in the CEE area. The conclusions lead to the idea that the theory does not hold at the global level, but there are still many differences at the country level. As such, for countries with a higher degree of financial integration (Czech Republic, Hungary, Poland) the theory is confirmed, in opposition with countries with a lower degree of financial integration (Bulgaria and Romania).

3. The analysis of the term structure interest rates in Central and Eastern Europe

The convergence of interest rate has been set forth within the Maastricht Treaty as a mobile of the economic growth; the low interest rate was considered to improve the access to financing, enhancing in this manner the potential for future growth. Nevertheless, the strong convergence at the level of the interest rate seemed not to incur positive effects in a general manner; this new perspective as well as the experience of the financial crisis, intervened in the context of an abundant liquidity, brought in the idea that low interest rate policy might be harmful. Over-lending and subsequent bubbles would give incentive to the destabilization of the macroeconomic environment, leading to recession.

A period marked by an important economic growth would imply a higher interest rate and a commensurate liquidity cost. In this context, the application of an abundant liquidity policy would be inappropriate due to the liquidity trap. In the light of the new economic paradigm, determined by the recent financial turbulences, the Maastricht Treaty provisions concerning the interest rate policy appeared to be uncorrelated with the macroeconomic developments.

According to the Maastricht Treaty, the average nominal long term interest in the last 12 months must not exceed by more than 2 percentage points the best performing Member States in terms of price stability; interest rate can be measured by long-term government securities or by other comparable securities. This expression is used as a compromise since there are no government bonds

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maturing close to 10 years in all Member States. But comparing different securities with different maturities is mathematically inaccurate. This problem could be avoided if short-term interest rates were used in order to valorize fruition opportunities of speculative interest rate differentials. Thus, from this perspective it would be more appropriate to choose as a reference Euribor monthly average and to compare it with monthly average interbank interest rates on acceding countries (Robor 12M, in Romania).

In addition, the difference of 2 pp. should be related to the CDS for the country risk as the interest rate should include some risk premium. Thus in countries where the CDS is at values of over 100 bp. during the year, the margin of difference should be increased to 3 pp. But a difference of over 3 pp. should not be tolerated since it might generate permissible interest rates close to two digits, which would induce too large asymmetries.

This study aims to analyze the dynamic of interest rate at the level of the EU, bringing forth a comparative perspective between the euro-zone and the non-euro zone countries. The interest rate is perceived as being impacted by an assembly of factors including economic growth, country risk premium and liquidity cost. The economic growth and inflation are reflected by the real GDP dynamic and consumption price index dynamic; country risk premium is encompassed in the spreads corresponding to country rating while liquidity cost is expressed in the form of the money market interest rate. The data were extracted from the Eurostat site (inflation rate, economic growth, liquidity cost) and from Damodaran site (the mapping of the country rating with the relative spreads).

The comparative perspective is oriented towards the euro-zone countries that are assumed to be complaint in a significant manner with the interest rate convergence criterion and non-euro zone countries that include both CEE countries as well as countries that benefited from the exit-out option (Denmark, Sweden and UK). The analytical approach is concentrated on the dynamic of interest rate in parallel with the dynamic of the determinant drivers.

The analysis intends to demystify the theory of interest rate convergence, concentrated mainly in the direction of low levels of interest rate. The objective of the study is to highlight some components of the interest rate that are likely to trigger an increase of the interest rate and to affect negatively the convergence criterion, but meanwhile to encompass a positive dimension. In essence, we conceive interest rate as a conglomerate of risk premiums in a holistic approach, being convinced that the risk-free rate is a purely theoretical concept, with no applicability nowadays because of the sovereign debt crisis.

The risk premiums that are reflected in the analysis relate to macro-financial risk (risk of recession encompassed in the economic growth fluctuations, inflation risk and country risk) and liquidity risk (risk of liquidity cost increase).
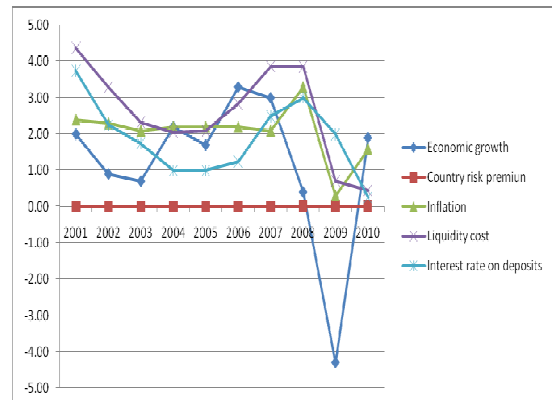
Euro area
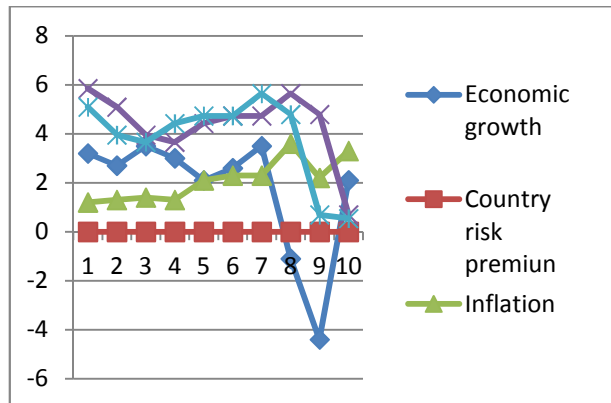
UK

Fig. 1. The dynamic of interest risk premiums in the euro area and UK (Source: author computations based on Eurostat data).

The figures below (Fig. 2 to Fig. 14) highlight that non-euro countries exhibit a higher interest rate in comparison with the euro countries. From the CEE countries, Bulgaria, Hungary and Romania have the highest interest rate; a similar behavior is reflected in case of UK, followed by Sweden and Denmark. The charts below reflect the dynamic of the drivers in correlation with the dynamic of the interest rate. At the level of the euro-zone, the period of economic growth is accompanied by a lowering of the interest rate, bringing forth the abundant liquidity; once appeared the period of recession, the liquidity costs increases and the interest rate follows up a upward trend.

A similar pattern can be identified as for UK and Denmark while in case of Sweden, the interest rate seems not to be impacted in a significant manner by economic growth. Interest rate exhibited a high resistance to some fluctuations triggered by financial turbulences; nevertheless, the interest rate is situated at a superior level in comparison with the inflation rate, highlighting the capacity of the monetary policy to counteract adverse macroeconomic evolutions. The only difference consists of the fact that as for Denmark, the interest rate is situated at an inferior level in comparison with the inflation rate, revealing the negative real returns.

Sweden
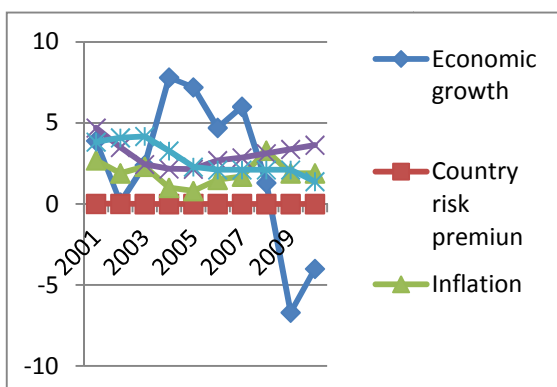
Denmark
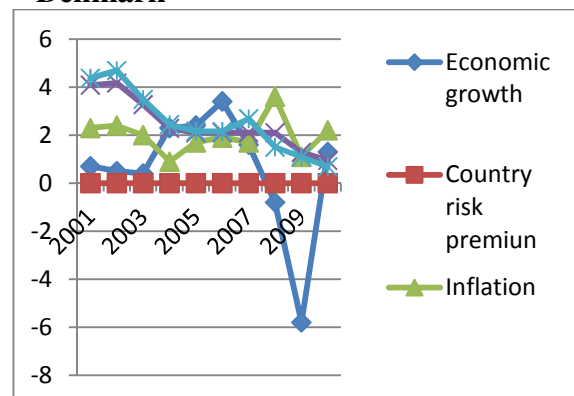
Fig. 2. The dynamic of interest risk premiums in Sweden and Denmark (Source: author computations based on Eurostat data).

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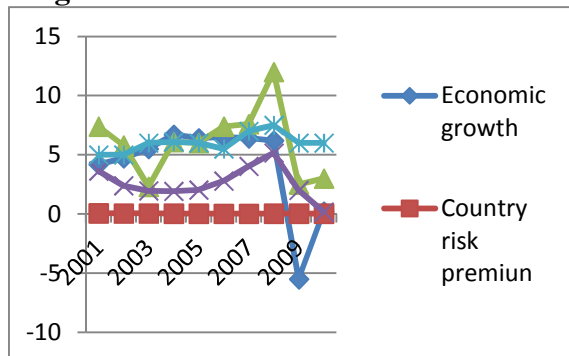
Bulgaria
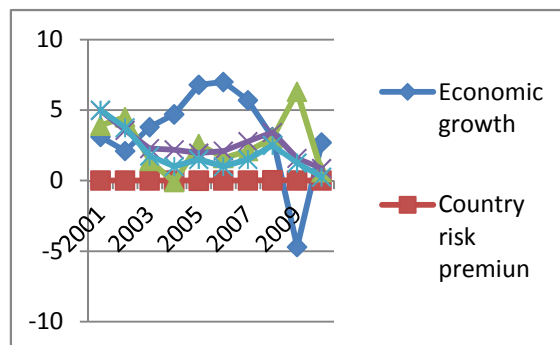
Czech Republic

Fig. 3. The dynamic of interest risk premiums in Bulgaria and Czech Republic (Source: author computations based on Eurostat data).

The CEE countries exhibit an important economic growth, affected only by the break-up of the financial crisis. The interest rate dynamic is superior in some cases to the inflation rate (Hungary and Poland) while in other cases it is maintained at an inferior level (Bulgaria and Czech). Romania follows a different pattern, with changes in the dynamic of the variables from one period to the other; as such, the interest rate follows closely the inflation rate dynamic.

Latvia
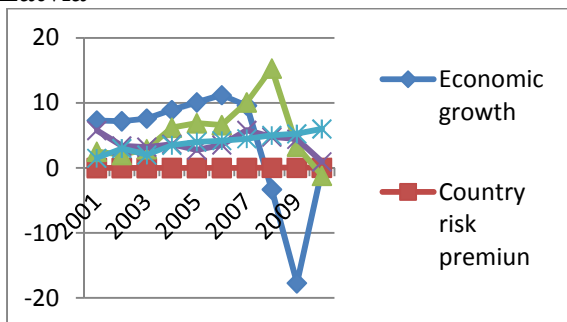
Lithuania
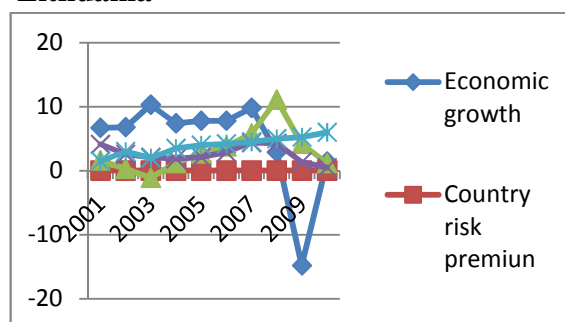
Fig. 4. The dynamic of interest risk premiums in Latvia and Lithuania (Source: author computations based on Eurostat data).

Hungary
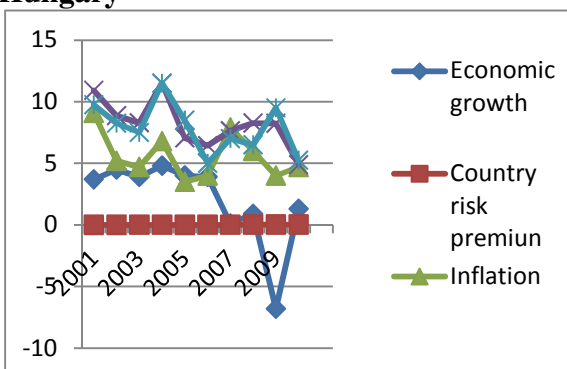
Poland
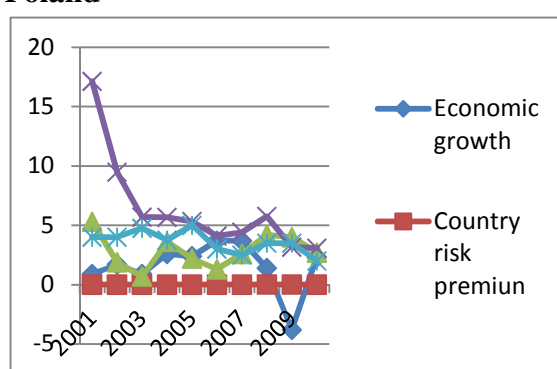
Fig. 5. The dynamic of interest risk premiums in Hungary and Poland (Source: author computations based on Eurostat data).

Due to the important economic growth, we can ascertain that higher levels of interest rate might not be interpreted in a negative manner, but merely correlated with the macroeconomic evolution.

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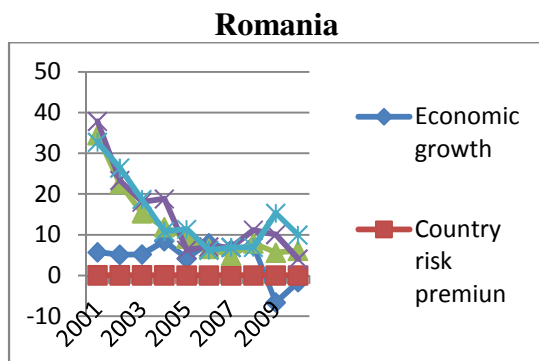
Fig. 6. The dynamic of interest risk premiums in Romania (Source: author computations based on Eurostat data).

In line with this rationale, based on a certain differentiation of the interest rate according to the evolution of the macroeconomic variables at the country level, we could draw up a global perspective concentrated on the dynamic of interest rate. For this purpose, a potential clustering of countries based on a certain interest rate pattern can be derived. The graphs below reveal the effective dynamic of the long term government bonds yields in three groups of countries: euro and non area, CEE region and PIIGS countries.
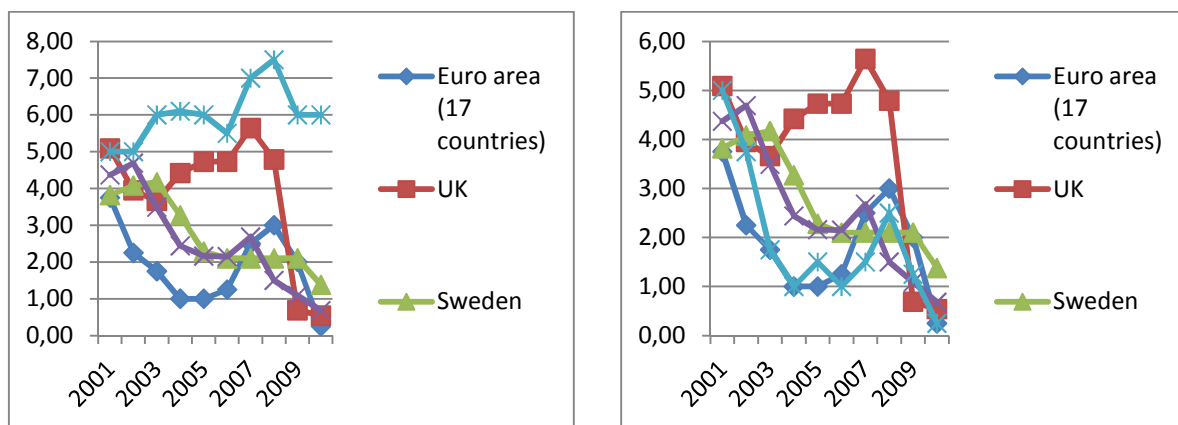
Fig. 7. The dynamic of long term government bonds yields in Euro area, UK, Sweden, Denmark, Bulgaria and Czech Republic (Source: author computations based on Eurostat data).
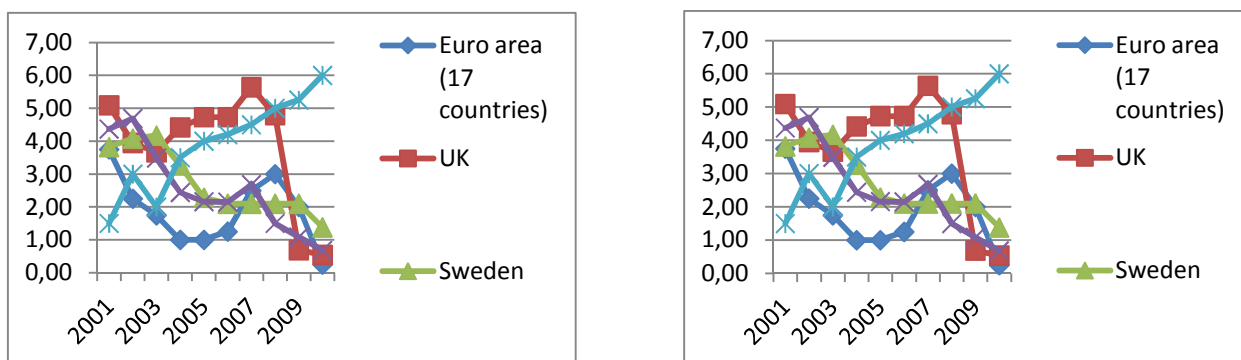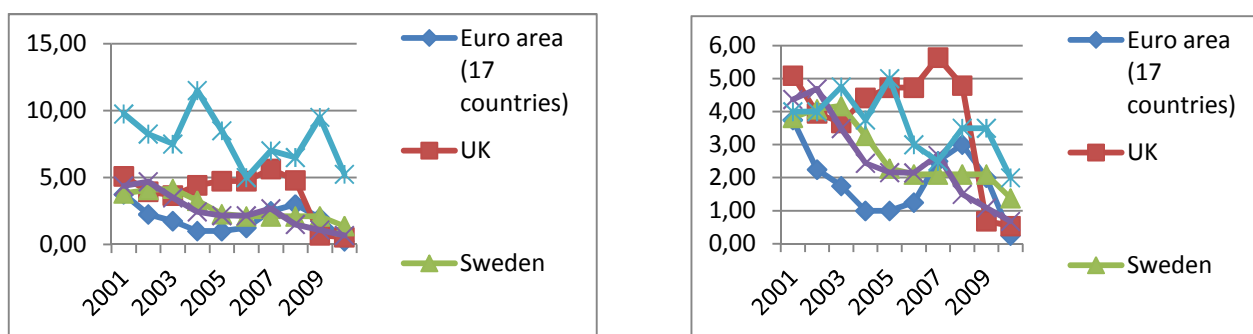

Fig. 8. The dynamic of long term government bonds yields in Euro area, UK, Sweden, Denmark, Latvia and Lithuania (Source: author computations based on Eurostat data).

In general, we remark a threshold level amounting to 5% that defines two different country areas in terms of interest rate dynamic. On one hand, there are countries that exhibit a downward trend of the interest rate that on average is below 5% during the whole period (2001-2011); in opposition, there

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are countries that reflect an upward movement of the interest rate that exceeds the 5% level. As such, the interest rate evolution might confer a new perspective on the convergence process at the European level as well as on international flows of capital: countries that exhibit an interest rate dynamic superior to the 5% level might be perceived as receptors of international flows for investment purposes, taking into account the significant opportunities for capital fruition while the level under 5% might be valorized for financing purposes.

Fig. 9. The dynamic of long term government bonds yields in Euro area, UK, Sweden, Denmark, Hungary and Poland (Source: author computations based on Eurostat data).

Germany and France have been selected as representative countries for the euro are; we remark the similarity of the interest rate dynamic in these two countries that reveal a downward trend of the interest rate below 5%. The interesting part consists of the fact that the downward potential is higher in case of Germany where the interest rate decreases up to 2% during the last two years while in France the downward trend is limited to 2.8%.
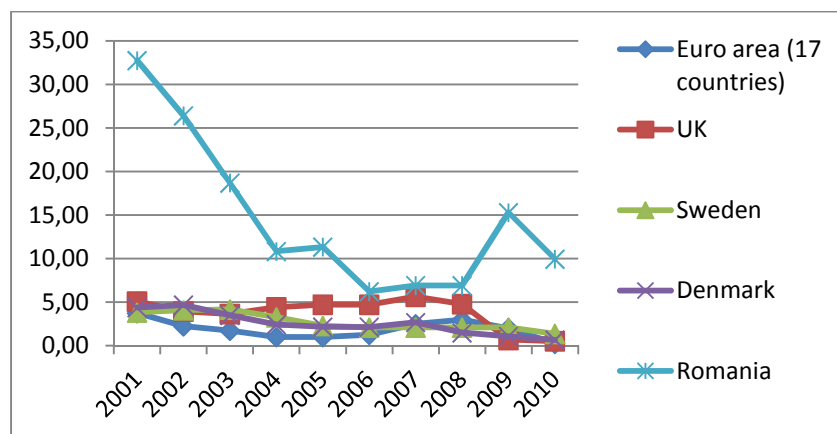

Fig. 10. The dynamic of long term government bonds yields in Euro area, UK, Sweden, Denmark and Romania (Source: author computations based on Eurostat data).

At the level of the euro area, the interest rate follows a downward trend as well, but the resistance level is encompassed by the 3%; the outbreak of the financial crisis reflects a reversal in terms of interest rate dynamic since the variable follows an upward movement up to the 5% level. Unlike the euro zone area as a whole, Germany and France exhibit downward trends of interest rate under the impact of the financial turbulences.
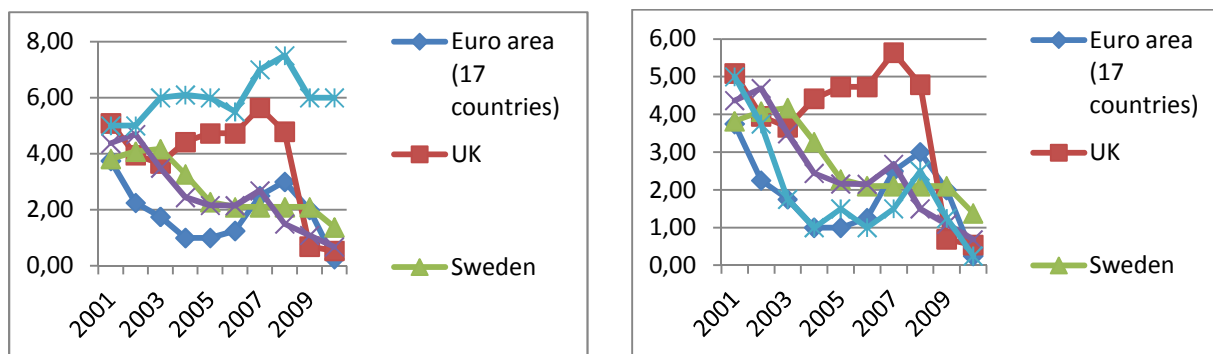
Fig. 11. The dynamic of interest rate in Euro area, UK, Sweden, Denmark, Bulgaria and Czech Republic (Source: author computations based on Eurostat data).
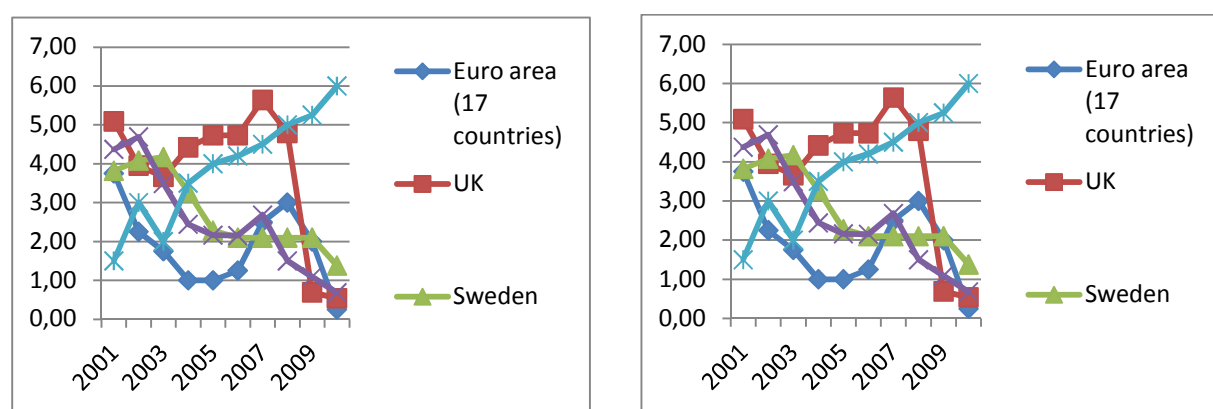

Fig. 12. The dynamic of interest rate in Euro area, UK, Sweden, Denmark, Latvia and Lithuania (Source: author computations based on Eurostat data).

The dynamic at the level of the whole euro zone area is determined under the impact of the PIGS countries as well; Greece and Portugal show an important increase in the interest rate under the impact of the financial crisis outbreak. In addition, the interest rate pattern is almost identical, exhibiting quite a stabilizing trajectory until 2009, followed by an abrupt increase up to 12% in case of Portugal and 20% in case of Greece. This sudden shock is explained mostly by the important country risk premium increase due to the deterioration of the public finance indicators.

At the country level, in case of France and Germany, considered mostly as the engine of the euro area, the interest rate dynamic is assimilated mostly to the financing dimension of the interest rate, highlighted by a significant downward trend. The situation is quite different at the euro zone level, revealing the impact of the countries that experienced budgetary disequilibria. The similarity of the patterns is remarked in case of Denmark, Sweden and United Kingdom as well. The downward trend of the interest rate is more significant than in case of the euro zone, pointing out the bigger potential for interest rate *manoeuvre* due to the absence of convergence pressures.
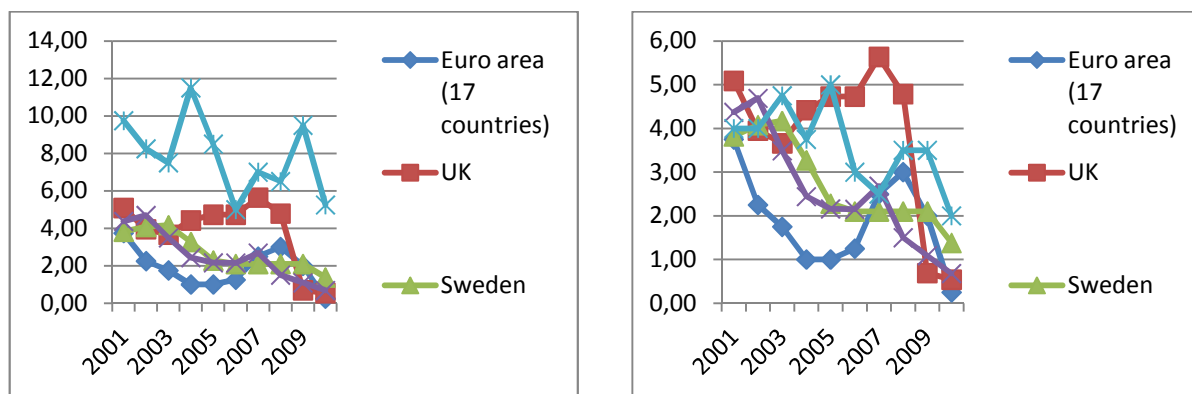
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Fig. 13. The dynamic of interest rate in Euro area, UK, Sweden, Denmark, Hungary and Poland (Source: author computations based on Eurostat data).
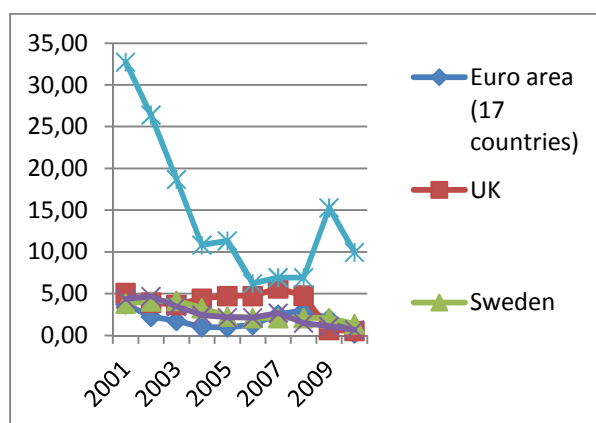

Fig. 14. The dynamic of interest rate in Euro area, UK, Sweden, Denmark and Romania (Source: author computations based on Eurostat data).

The CEE countries valorize the investment dimension of the interest rate. The dynamic of the interest rate reflects higher levels of this variable in comparison with the other groups of countries, confirming the position of the Eastern Europe as a receptor of international financial flows due to the higher potential for important growth. The outbreak of the financial crisis determined the downward of the interest rate to a lower extent in comparison with the PIGS countries, highlighting the more stable environment, especially in terms of public finance position.

4. Conclusion

This study concentrated on the dynamic of interest rates in the EU, with a special emphasis on the CEE countries. The interest rate convergence criterion was analyzed on a critical basis in light of the term structure interest rate theory, having in mind the perspective of a premium risk conglomerate; this assembly of risk factors generated additional risk layers that led to the positive trend of interest rate. The research shed light on the sources of additional risks at the country level, as well as on their joint evolution that could give incentive to potential groups of countries, with a similar interest rate dynamic.

The risk premiums that were reflected in the analysis relate to macro-financial risk (risk of recession encompassed in the economic growth fluctuations, inflation risk and country risk) and liquidity risk (risk of liquidity cost increase). The analysis highlighted that non-euro countries exhibit a higher interest rate in comparison with the euro countries. From the CEE countries, Bulgaria,

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Hungary and Romania had the highest interest rate; a similar behavior was reflected in case of UK, followed by Sweden and Denmark.

In general, we remarked a threshold level amounting to 5% defining two different country areas in terms of interest rate dynamic. On one hand, there are countries that exhibit a downward trend of the interest rate that on average is below 5% during the whole period (2001-2011) (France and Germany); in opposition, there are countries that reflect an upward movement of the interest rate that exceeds the 5% level (the CEE countries). As such, the interest rate evolution might confer a new perspective on the convergence process at the European level as well as on international flows of capital: countries that exhibit an interest rate dynamic superior to the 5% level might be perceived as receptors of international flows for investment purposes, taking into account the significant opportunities for capital fruition while the level under 5% might be valorized for financing purposes.

Even if the macroeconomic situation of the CEE countries was not destabilized to the point of being negatively affected by the financial crisis, the intensive capital flows' withdrawal was the main driver of the sudden national currency depreciation.

5. Acknowledgement

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ANTI - CORRUPTION POLICY IN THE CZECH REPUBLIC

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Abstract. The Czech Republic was attempted bribery of public entities qualify as a crime deserving the most severe sentences already in the Přemyslovci. Remarkable, however, that despite this fact, the corruption in the Czech Republic always well managed. This paradox is, to some extent the result of the fact that the Czech Republic remain high long-term effectiveness of corrupt activity is the gain from corruption highly outweigh its risks. While the requirement of reliability as a key principle of successful operation of businesses and public administration in particular, was implemented into the legal form was during the First Republic. The present article deals with the anti-corruption policy in the Czech Republic, analyzed is the past twenty years, when building an effective anti-corruption policy in the Czech Republic is an integral component of wider processes of democratization of Czech society.

Keywords: corruption, anti-corruption policy, Czech Republic, economic policy, ethics, economic ethics, economic transformation.

JEL Classification: E6, P2, D73.

1. Introduction

It is a remarkable fact of the Czech cultural history that an attempt at bribing of public figures used to be, under the law of the Přemyslid dynasty in our country, a crime that would be punished with the severest of punishments. Another remarkable thing is the fact that despite this historical experience bribing has always been doing well in the Czech lands. This paradox results, to a certain extent, from the fact that corruption activity has been highly effective in the Czech Republic for years, in other words: profits generated from corruption prevail over the related risks. This is even more surprising if we are aware that the requirement for credibility as one a key principle of successful activity of economic entities was implemented into the law of the First Czechoslovak Republic, which concerned especially the public administration. However the heyday of corruption is especially considered the period of the Austro-Hungarian "Enlightenment" bureaucracy and the second half of the 20[th] century, that is, the period of the socialist centralized power. After the Velvet Revolution of 1989 corruption did not disappear but transformed into new spheres, forms and ways of manifesting itself.

According to Holman (2004) the corruption in the Czech Republic has grown to an ominous extent since the proliferating system of bureaucracy and regulations is the matrix for corruption, honest people create and consolidate a system in which it is impossible to become rich from honest business and trading on markets but only on the basis of state orders, state subsidies and other forms that milk the pocket of tax payers. What else could one expect in a country in which more than a half of the domestic product passes through the state treasury. We consider corruption and slow establishment of institutional conditions for efficient functioning of the market mechanism the most serious problems of the Czech society and therefore of the Czech economy too. The most corrupted spheres in the Czech Republic have been considered for a long time the public administration (despite the implemented decentralization), public authorities, the police, the government, political parties and ministries. On the other hand the Government of the Czech Republic has invested financial and other resources into the establishment of an effective anti-corruption policy aiming at the reduction of the real and perceived level of corruption in the Czech Republic. So we face a situation when there is a

clear governmental framework for fighting corruption while, on the other hand, the problem of corruption is exacerbated by low creditability of the government and the political elite as such due to its ambiguous attitude, evasiveness and inconsistency in enforcing the anti-corruption legislation. This all reinforces the economic profitability of corruptive behaviour and the low effectiveness of the anti-corruption fight. The objective of this essay is to map the process of establishment and development of the anti-corruption policy under the circumstances of the Czech Republic and to evaluate the effectiveness of its practical implementation.

2. Forming the anti-corruption policy in the Czech Republic

2.1 The period of all-society transformation

Essentially the corruptive environment in the Czech Republic does not differ from those in other countries. Similarly as all countries of the former Soviet bloc the Czech Republic underwent 40 years of bureaucratization of the economy and entire society organized by the communist party (Spěváček, 2002). Even though the economic-political situation of the country changed after 1989 the new environment has also brought about economically harmful phenomena, such as economic criminality and tunnelling [48], and has born new opportunities for corruption related mostly to large transfers of property in privatization and restitution processes and to slow transformation of informal institutions. The functional changes of corruption within this period were mainly determined by corruption being shifted from the sphere of services and trade into the sphere of the public administration, *the corruption of the transformative period* itself was generated by processes that were unique and unrepeatable in their very nature.

Still at the beginning of the 90ies corruption was not considered a serious problem in the Czech Republic. According to Frič (1999) privatization was generally perceived as success in the Czech Republic until at least the end of 1995 and it took several years before its true results has begun to manifest themselves in practice. Corruption for not the topic for public speeches in the first years after the revolution how starting with the half of 1994 it was becoming clear that undesirable demonstrations of corruption took place in the country and that especially in relation to economic criminality in the course of approving and implementation of privatization projects and in relation to the coupon privatization. In 1994 Jaroslav Lízner, the director of the Coupon privatization centre, was apprehended and sentenced and become a key figure of the entire lawsuit. He was accused of taking bribes for obtaining shares in the second phase of the coupon privatization. His apprehension and prosecution represented an important turning point of the way the Czech public perceived the privatization. Lízner was the first public figure of high importance who was convicted of corruption. A series of privatization cases manifests serious problems with corruption in the course of privatization in the Czech Republic (e.g. privatization of Třinecké železárny, Poldi Kladno, firms under Čokoládovny Praha, Karlovarský porcelán, Knižní velkoobchod, Tesla Přelouč, privatization and financing of political parties and many other cases). To this the OSI (OSI, 2002) says that the corruption dynamics was, to a large extent, created by the conditions of the economic transformation. Especially the methods of privatization via coupons and the sales to Czech entities without sufficient capital created an economy governed by investment funds and banks under state control that granted loans that were not based on market criteria. In both cases this meant selling away assets, funds and privatized firms at favourable prices with a tacit approval or active participation of state officials. This entire process was governed by corruption – this concerns decisions on privatization, granting of bank loans and probably also the process of creation of regulatory legislation for investment funds.

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[48] The term "tunnelling" was born in the Czech Republic as a by-product of the transformation of the Czech society. Normally this term is used for an extensive financial fraud during which a management of a company transfers financial means into other companies that are often owned by these managers. The relocation of these financial means is usually executed via deals that are disadvantageous for the tunnelled company.

In 1991 the first special division of the Police of the Czech Republic was established to protect economic interests and this was transformed in 1994 to the *Policy service for detection of corruption and serious economic criminality (SPOK)* with authorization for the entire territory of the Czech Republic. In surveys concerning corruption in the Czech Republic in the 90ies of the 20[th] century (executed by GfK Praha) that the Czech public considered the public administration the most corrupted sphere, which was followed by courts and public health. Administrative operations were even considered by the public the most corrupted institutional environment. In 1998 almost one third of the population (31 %) of the Czech Republic was of the opinion that administrative operations represent the field with the highest portion of corruption. Only 3 % of the population of the Czech Republic had the same opinion at the end of the socialist period. In 1996 the Czech Republic found itself for the first time in the list of countries ranked according to the CPI (Corruption Perception Index) that is every year published by Transparency International (TI). The index value of 5.37 ranked the country in the 25[th] place, closely behind Poland (TIC, 2012). However it should be pointed out that the achieved CPI value was the most favourable in this very first year of classification. Since then the decreasing of the CPI values has been obvious.

The arising concern over the scope of corruption made the government under the leadership of Václav Klaus to start to work on a conception to fight corruption. By resolution no. 673 dated the 29[th] October 1997 the government set the task of "proposing a conception of offensive methods to reveal corruption of workers and officials of the public administration". Even though this initiative became a basis on which the future governmental anti-corruption policies were built, the key factor influencing the process of forming the Czech anti-corruption policy was, especially after 1997, the process of converging the views of the European Union. Corruption in the Czech Republic, similarly as in other candidate countries of the time, was pointed out by the European Commission as one the main institutional problems requiring the establishment of future effective tools of the anti-corruption policy. The pressure from the European structures thus gradually generated political determination to create a national anti-corruption strategy and set to the reformation of authorities that are active in investigating corruption. In the course of this the European Union has provided the Czech Republic with a significant financial, technical and methodological assistance (e.g. the financial means to reform the Czech judicature provided via the PHARE programs).

At the end of the 90ies of the 20[th] century corruption became to be perceived as a serious problem by the general public in the Czech Republic. According to an IVVM survey from 1998 economic criminality and corruption was indicated by 82 % of the population of the Czech Republic as the most serious problem of the Czech society. It was followed by general criminality (72 %), organized criminality (71 %), social sphere (61 %), public health (60 %) and unemployment (58 %). This fact became a basis for the pre-election campaign for the parliamentary elections in 1998 for the Czech Social Democratic Party (ČSSD), which defined corruption as one of their proclaimed priorities. The anti-corruption campaign was called *the clean hands campaign* and its objective was, similarly as in Italy in the 90ies of the 20[th] century, to reveal and break up bonds between the political and economic elites and prevent corruption from penetrating the highest strata of governmental circles. The official goal of the campaign was to create an environment acceptable for foreign and local investors and renovate the credibility of the states in the eyes of its citizens (OSI, 2002). The campaign included the establishment of an interdepartmental *Committee for the protection of economic interests of the Czech Republic*, the task of which was to coordinate the newly created anti-corruption measures. These efforts should have been assisted by the activities of *the Coordination and analytical group* led by a minister without portfolio. However despite this endeavour now visible improvements were manifested and the campaign itself was suspected to have become a victim of corruption and an area susceptible to political decisions. Therefore the group was disbanded in 2000 with the following results: in the course of its existence the group submitted 107 proposals to start investigation, 48 cases were really investigated while only in 17 cases the accused were sentenced for bribing.

Therefore it can be said that despite the fact that the 'clean hands' campaign was a source for forming the anti-corruption policy in the Czech Republic, it did not introduce any clear conception to fight corruption and no clear and measurable objectives and clear responsibilities were defined for its fulfilment (Volejníková, 2007). This unsuccessful intent in the end became an issue that even politicians were reluctant to feel responsible for. It has reduced the so-much needed credibility of the government in the eyes of the Czech public and the view that corruption pays off still prevails.

2.2 Government Anti-Corruption Programme

The *Government Anti-Corruption Programme* (hereinafter the Programme) was acknowledged by the Czech government in the Resolution no. 125 from 17th February 1999. The Programme became the pillar of Czech national anti-corruption policy for several years, constituting a long-term, systematic project of anti-corruption measures of legislative and organizational nature, and binding the Czech government to cooperation in the fight against corruption on international level, too. The effort to consistently fulfil individual recommendations following from the government programme also accompanied the Czech Republic on its way to joining the European Union. As specified in the document Government Anti-Corruption Programme in the Czech Republic and the Report on Corruption in the Czech Republic and the Possibilities of Effective Action Against this Negative Social Phenomenon from 17th February 1999 no. 125: The aim of the Programme is to describe the nature of the course of action in the fight against corruption and its objectives, to set down the basic methods and means of the course of action in the fight against corruption, and to suggest specific implementation measures in individual areas of social life, determine their administrators, set the schedule, and define the way of checking their fulfilment (MVCR, 1999). The Programme characterizes both new and ongoing steps of the Czech government in its anti-corruption efforts. The fulfilment of this aim is characterized by an effort to make use of the possibilities of existing standards and institutions, and also of the potential of current Czech civil society. The Programme's priority was to fight against corruption in the public sector; special attention is paid in the Programme to the seriousness of corruption among officials in central organs of state administration, judges, public prosecutors, police officers, customs officers, and employees of revenue offices and state inspection institutions. The Programme assigned the Ministry of the Interior to compile an annual "Report on Corruption in the Czech Republic and on Fulfilment of the Schedule of the Programme's Measures". The Report contained results from surveys and statistics on corruption, evaluation of the state of corruption in the Czech Republic, fulfilment of the schedule following from the Programme, and possibilities of further action. This Report was followed by further tasks specified by Resolution of the Government of the Czech Republic. The Resolution of the Government of the Czech Republic regarding the Report on Corruption in the Czech Republic in 2004 and on Fulfilment of the Updated Government Anti-Corruption Programme from 2005 extended the time interval for submitting further Reports to *two years*. The aim of this measure was to allow better evaluation and analyses of the effects of accepted anti-corruption measures from long-term perspective. The specific measures of the Programme were divided into four basic areas:

(1) Legislative measures
(2) Organizational measures
(3) Measures in the area of education and media action
(4) Modification of international cooperation

In all these areas, specific tasks were defined, constituting the mechanisms for fighting corruption. Each of the tasks specified in the Programme had its administrator (or multiple administrators for issues requiring interdisciplinary approach) and *fulfilment deadline*. The Programme also included monitoring of the course of its fulfilment and the changes in the state of corruption level following the implementation of given anti-corruption measures. The evaluation of the fulfilment of measures

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included in the Programme was done from the position of the government, but the findings of other, especially international institutions were also taken into account. In this area, the government put special emphasis on cooperation with Transparency International whose Czech branch (TIC) started operation as early as in 1998. It can be observed from the description of the Programme fulfilment that most Programme tasks have been fulfilled.

The government of the then prime minister Miloš Zeman subsequently submitted the *Updated Government Anti-Corruption Programme* (from 2004) which contained mainly the still relevant or ongoing tasks from previous government resolutions, and the tasks that had not been fulfilled in the specified period. This included especially some legislative plans of the government, some of which still constitute a barrier to creating an anti-corruption environment in the Czech Republic even today. This fact was for instance pointed out by OSI (2002), stating that in the Czech Republic corruption in the legislative process appears to be an increasingly serious problem, the increase of which is supported by uncontrollable lobbying, parliamentary immunity, and inadequate control of the conflict of interests. This means especially an effective Public Procurement Act, Lobbying Regulation Act, Act on prohibiting bearer shares, or enforcing criminal liability of businesses. The continuous fulfilment of the Updated Government Programme became the content of the official anti-corruption policy of the Czech government in the following period.

3. Government Anti-Corruption Strategy

The prospects of further fight against corruption in the Czech Republic were supposed to be determined especially by consistent implementation of long-term objectives presented by the *Government Anti-Corruption Strategy for 2006-2011* published by the then Minister of the Interior (Ivan Langer) in October 2006. The strategy specifies three key principles of the fight against corruption - *prevention* (minimizing state regulations, simplifying legislation, de-bureaucratization of state administration, publicizing and public denunciation of corruption cases), *transparency* (especially in public procurement, drawing on public funds, decisions on the rights and duties of citizens, computerization of public administration, implementation of a single anti-corruption line), and *sanction* (especially increasing the penalization for proved corruption in Penal Code and the Act on the Conflict of Interests, implementation of a "blacklist" of people convicted for corruption, prohibiting them from participating in public contracts, implementation of specialized judicial bodies focusing on corruption, etc.). The gradual fulfilment of these ambitious objectives was supposed to become the long-term pillar of effective government anti-corruption policy (Mirek Topolánek government) in the Czech Republic (i.e. ODS policy). However, on the threshold of the following parliamentary elections (May 2010), it showed that even these long-term anti-corruption objectives remained largely only unfulfilled visions.

The fight against corruption therefore became again one of the key pre-election slogans. The most vociferous critics before the May elections in 2010 were especially the new political parties (Věci veřejné and TOP09) which were soliciting votes from voters unsatisfied with the prevailing situation and which were able to point out that the ones responsible for corruption affairs in previous years were the politicians from ČSSD and ODS who had been taking turns in the government in the long term. The new coalition government (the current government of Petr Nečas) from these May elections proclaimed itself the *government of budgetary responsibility, right, and fight against corruption,* and clearly defined the fight against corruption as its priority. That is why it presented the new, very ambitious *Government Anti-Corruption Strategy for 2011 and 2012*. It follows up on the Government Anti-Corruption Strategy for 2006-2011 and is based primarily on the Government Policy Statement and the Coalition Agreement. It also contains a number of other tasks and measures based on the need to eliminate the imperfections of current legal provisions and the practice so far, and on the suggestions from non-government non-profit organizations. The aim of the new Strategy is *"to*

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decrease corruption opportunities by gradual accepting of individual measures, both by using a balanced proportion of prevention and repression, and by making the corresponding processes more transparent" (MVCR, [online]). As opposed to the past, the new Strategy makes use of the approach based on individual areas of public life, namely:

(1) *public administration* – contains measures in public administration, both on the level of central administration bodies, and on the level of local governments;

(2) *public contracts* – the area that is currently considered to be the most affected by corruption;

(3) *Police of the Czech Republic* – besides repression, great emphasis is put on comprehensive prevention measures of non-legislative nature;

(4) *public prosecutor's office and courts* – same scope as the chapter on the Police of the Czech Republic;

(5) *legislative power* – oriented mainly on prevention and on transparency of lawmakers' actions.

Each of the specified areas contains both legislative and non-legislative measures, and each item has its fulfilment deadline and administrator. The Strategy also includes the area of education in sphere of the fight against corruption, focusing mainly on educating officials, police officers, judges, and public prosecutors. The Strategy also defines the following *eleven government priorities*:

1. Amendment of the Public Orders Act.

2. Adoption of the Act about officials to secure depoliticization, professionalization and stabilization of the public administration.

3. Introduction of stricter rules for the management of the property of villages, towns and regions.

4. Modification of conditions for the management of the property of legal persons constituted by the state or large self-government units and of firms partially owned by the state.

5. Strengthening of supervisory authorities of the Supreme Audit Office in relation to autonomous units.

6. Continuation and completion of the introduction of electronic means for the administration of agendas under the control of the public administration.

7. Streamlining the system of free access to information.

8. Strengthening of the autonomy and responsibilities of the state public prosecution for the performance of entrusted powers.

9. Submission of an act introducing legal liability of legal persons.

10. Strengthening of the recovering function of criminal proceedings, including confiscation of revenues.

11. Analysis of whistle blowing and protection of persons who report corruptive behaviour.

In November 2012 the government should be submitted the assessment of the enforcement of tasks included in the Strategy as well as a proposal for a new anti-corruption strategy for the period of 2013 and 2014.

As the last Report on fulfilment of tasks included in the Strategy shows quite a few tasks set for the two-year period of the current coalition government in the Czech Republic have already been fulfilled or are continuously dealt with and solved. The current coalition government has really managed to enforce a series of important anti-corruption measures of legislative as well as non-legislative nature. These are especially Act no. 418/2011 Coll., on criminal responsibility of legal persons and proceedings against them, which became effective on the 1st January 2012 and an amendment of Act no. 137/2006 Coll., on public orders (Act no.55/2012), which became effective on the 1st April 2012. Since by the autumn of 2011 37 points of the total of 76 points of the anti-corruption strategy had been met we can agree with a declaration of Nečas, the prime minister, that as far as the anti-corruption policy is concerned this government has managed to proceed further than all previous governments. This achievement was certainly supported by the position of *the vice prime minister for*

fighting corruption newly established in spring 2011 and the establishment of *the Governmental Committee to fight corruption*, which has created the possibility of a system-based solution for the institutionalised background of the anti-corruption policy. *The governmental Committee for the coordination of the fight against corruption* is a consulting body for the government for the sphere of corruption fighting and for assessment of corruption risks (CIA – Corruption Impact Assessment) in the legislation process. The committee coordinates and assesses the issue of fighting corruption, submits to the government proposals of measures to reduce corruption risks within the scope of activities of the public administration and to increase the transparency of its activities, checks the fulfilment of tasks set in the Strategy for individual departments, coordinates their activities in the issue in question and provides methodological assistance related to this. As far as the institutional basis for the anti-corruption repression is concerned it is at the moment secured in the Czech republic by the so-called anti-corruption police *(Division for detection of corruption and financial criminality)*, which exists within the police hierarchy, and also by *the Financial and Analytical Division* of the Ministry of Finance, which functions on the basis of the money laundering act. The increased efforts can be observed in the sphere of cooperation with non-governmental organizations and international organizations, which have been assuming a role of increasing importance in analysing the corruptive climate and defining individual anti-corruption tools for the Czech Republic. The cooperation of the Czech government with the non-governmental no-profit organization TIC appears to be the most productive.

4. Conclusion

It is obvious from the preceding text that the overall framework of the anti-corruption policy in the Czech Republic has been (similarly as in other candidate countries of the European Union) especially influenced by the Copenhagen entrance criteria that formed a basis on which the Governmental program to fight corruption. Therefore the assessment of the development of fight against corruption executed by the European Commission has been so far based on Reports on the fulfilment of the governmental program. Even though the Program was more or less successfully fulfilled at the time the Czech Republic entered the European Union, still the country entered the union with many problems, out of which the European Commission identified *the lack of political support and political consensus in the course of solving problems related to corruption* as one of the key problems of the Czech Republic. The results of professional evaluations, empiric surveys, public opinion surveys and available official statistics confirm this trend in the way corruption is perceived in the Czech Republic and therefore we can speak of a long-term stagnation tendency in state implemented and applied anti-corruption measures that are not accompanied with an adequate response by the political environment (in 1996 the Czech Republic had no clear framework yet, since 1998 it has been clear that there is willingness to fight corruption). However the state's endeavour to suppress corruption has not been reflected in the private sphere yet due to the lack of a corresponding interest on the part of economic entities to establish mechanisms against corruption, which is true despite the fact that corruption itself is identified as one of the largest obstacles for successful business in the Czech Republic. Non-transparent structures of ownership and non-publishing of information about the internal operation of companies have negative impact on public orders, subsidies and all situations in general in which the private sector gets into a direct relation with the state administration (Tanzi, Davoodi, 2001).

Introduction of anti-corruption mechanisms still lacks in having positive impact on the improvement of the corruption status in the Czech Republic. The introduction of anticorruption mechanisms itself is a necessary guarantee to improve the corruption status in the Czech Republic, however it is not a sufficient guarantee. There is no independent institution in the Czech Republic that would give the corruption issue sufficient efforts and time. Independent, special so-called

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anti-corruption agencies have been established e.g. in Serbia, Latvia or South Korea (TIC, 2012). The United nations declaration against corruption from 2003, which was signed (however not ratified yet) by the Czech Republic two years later clearly defines the format that such independent agency for an active anti-corruption policy should assume. We are of the opinion that the efficiency of fighting corruption in the Czech Republic is reduced not only by the reluctant approach of legislators and by weak political dedication to adopt and enforce individual anti-corruption tools but also by the ever growing regulatory functions of the state and the system of redistribution processes that often assumes absurd dimensions (Volejníková, 2006).We can also say that revelation of cases of corruption is not, as a rule, the result of the efficiency of responsible authorities, prosecutors and enforcement of the law, but it especially is especially the result of the work of media. Serious cases of corruption have been left unsolved and unpunished for a long time; the independence of courts is still doubted in practice. It should be highlighted too that non-fulfilment of obligations and leniency in the process of implementation of anti-corruption measures, as well as their scope and quality, as closely related to financial support and their demands often does not allow for efficient and proactive realization of all desirable initiatives. However the Czech Republic is also behind as far as prevention is concerned.

Our long-term interest in the issue of corruption and anti-corruption policy of individual governments in the Czech Republic has confirmed that despite changes in the broader economic and societal environment and the fundamental change in the formal institutional framework corruption remains a key problem of the Czech economy and of the entire society. Moreover the trend of perceiving corruption in the Czech Republic has been deteriorating. So, more than twenty years of renovation and building of democratic structures has not been a sufficient period to realize a substantial change in the sphere in question. It can be said that at the moment the anti-corruption institutional structure is been intensely (more than ever before) formed in the Czech Republic as the basis for the integrity system that is considered the most effective anti-corruption mechanism. On this level we consider *the credibility of the government* as the key bearer of the anti-corruption policy and integrity of the state as crucial. Seven governments and six prime ministers have been changed in the Czech Republic within the last eight years. The government of the current coalition government has been permanently accompanies with accusations that challenge the integrity of its individual members and its credibility as a whole. It is a paradox that, together with new serious corruption cases, the low credibility of the Czech government (concerning politicians and the state in general) represents a very serious obstacle in fighting corruption. Only the further development and future will show the effectiveness and efficiency of the anti-corruption policy of the government. Nonetheless this text clearly shows that it is this very form of the state policy in the Czech Republic that is an indispensable tool of the democratization process and the all-society and economic stabilization.

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INTERNATIONAL POLICY FRAMEWORK

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Abstract. The study of International Relation (IR) can be traced back to the 17th century, since then IR has been dominated by informal trans-governmental and trans-national relations between counties. This paper defines an International Policy Framework in light of theories such as New Institutional Economics and Spatial Economics, whereby economies can enhance their export income and societal benefits. States can facilitate growing their economic pie; expanding access to wealth. Concurrently they can increase their tax base and enhance their ability to deliver quality public services. After establishing a general understanding of the macroeconomic activities within an economy, the theory of comparative advantage has been defined to validate sector-specific openness whereby trading partners can benefit mutually. Finally an Input/Output model is used to evaluate the economic activities and a general framework is established defining key steps for identifying and implementing successful IRs.

Keywords: international relations, international policy, country partnership policy, international partnership framework, economic partnership framework, international development.

JEL Classification: F50.

1. Introduction

The history of International Relations (IR) can be traced back to the Peace of Westphalia of 1648, wherein state system was developed (Straumann, 2008). However, the theory of IR was not developed until after World War I. In addition to contemporary theories of liberal internationalism, Marxism has been a foundation of IR.

Marxist and Neo-Marxist theories of IR believe on the economic and material aspects, they view the international system as an integrated capitalist system which endeavours capital accumulation. In contrast to the Marxist theory 'dependency theory' argues that the developed countries, in their quest of power, jeopardise the developing states through political advisors, foreign missions, experts, and multinational companies (MNCs), thus incorporating them into the capitalist system in order to appropriate the natural resources. According to this theory a set of Core states exploit a set of weaker Periphery states for their prosperity.

1.1 Types of international agreements and arrangements

International relations are conducted through international arrangements and agreements. In general practice there are three types of international agreements and arrangements:

a. Legally binding in international law:
   i. These are concluded between countries, the governments of countries, or international organizations;
   ii. Are preferably called `agreements´ or `treaties´;
   iii. Contain mandatory language;
   iv. And are unclassified.
b. Legally binding in the domestic law of a country or part of a country (e.g. a State or Territory):
   i. These are concluded between parties which are legal entities under that domestic law;
   ii. are preferably called `agreements´ or `contracts´;
   iii. contain mandatory language;

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    iv. and may be classified.
c. Not legally binding in international or domestic law but politically and morally binding:
    i. These can be concluded between any parties;
    ii. are preferably called „arrangements" or „memoranda of understanding";
    iii. do not contain mandatory language;
    iv. and may be classified.

1.2 Sister state agreements and Memorandum of undersanding

The objective of Sister State Relations (SSRs) is to create and foster cultural and friendship links with overseas countries. Sister State Agreements (SSAs) are ministerial level government to government arrangements designed to foster two-way trade, education, and cultural initiatives (Gatfield, 2000).

Increasing numbers of SSAs have emerged during the past two decades. Generally, these agreements are formal and trade-strategic. They have the potential to provide substantial leverage for industry initiatives. As previously isolated nations become increasingly interdependent, global cooperation is becoming crucial to social and economic vitality.

Indications are that SSA's have evolved out of Sister City Relationships (SCRs). Macmillan dictionary defines sister cities as twin towns. SCR linkages are generally based in similarities and shared interests through history, sports, and cultural ideologies (Gatfield, 2000).

According to a definition from an encyclopaedia a memorandum of understanding (MOU) is a document describing a bilateral or multilateral agreement between parties. It expresses a convergence of will between the parties, indicating an intended common line of action. In the general context, they identify initial areas of cooperation and are often loosely structured; they may not necessarily include in-depth arrangements. In general MOUs reflect aspects of the theory of transnational relations (described later in this paper) and can serve as an early step establishing peer-to-peer or SSR.

2. Literature review

Individual states interact and coordinate with each other, and in the course of state to state interactions they exhibit commonalities in behaviour and actions. These can be analysed in the light of economic theory.

Trans-governmental/Transnational relations
Robert Keohane and Joseph Nye in 1974 defined "transgovernmental relations" or international relationships between government officials as relations "that are not controlled or closely guided by the policies of the cabinets or chief executives of those governments." Similarly, "transnational relations" are defined as "contacts, coalitions, and interactions across state boundaries that are not controlled by the central foreign policy organs of governments." (Nye and Keohane, 1974)

An examination of literature reveals that transgovernmental cooperation is a milestone achievement in international law practice, and it is likely to strengthen the liberal internationalism. Thus, rather than challenging the traditional architecture and processes of cooperation, it is often synergistic. These networks perform a gap-filling role, especially under situations where treaties are economically and politically barred they provide an alternative mode of cooperation.

New institutional economics – transaction costs
Transaction cost economics (TCE) represents another approach to studying IRs. All transactions require some kind of mechanism - what Williamson (1985) calls a governance structure - to protect the transacting parties from various risks associated with exchange. The goal of risk mitigation induces states to contract with sister states or states of interest. Such arrangements remove or reduce barriers to trade and investment and reduce transaction costs, thereby providing economic benefits to partners. Moreover, there may also be associated multiplier effects domestically: internal

competition within a state triggers increased international engagement from more players and can remarkably improve regional, and hence, state economies. Contractual arrangements provide incentives to the local businessmen to explore opportunities in the sister states, and simultaneously provide an attractive platform for foreign direct investors.

Spatial economics and geographical concentration

The IR can also be explained in terms of spatial economics and geographical concentrations. It is important to know who the state should choose to interact and the answer to this can be found applying the findings from Central-place theory by Christaller. Although, the theory defines economic relationship between the cities still the findings from this theory can be mapped to the states, and how they interact showing the trade-off between economies of scale and transportation costs leading states to cluster together establishing close links and coordination.

Transportation favours economic development and has an impact on state interactions in terms of spatial concentration. Throughout history, transport networks have structured space at different scales. The fragmentation of production and consumption, the location specificities of resources, labour and markets generate a wide array of flows of people, goods and information. The structure of these flows in terms of origin, destination and routing is closely related to spatial economics (Masahisa et al., 2001).

3. Benefits

The main purpose of international state interaction incorporates the idea of attracting foreign capital inflows in the form of foreign direct investment. However, this interaction is never one way: that is the international relations occur on a give-and-take basis and the state plays the part of an intermediary regulating the market between the two states. The idea is to facilitate the actions of people and give access to wealth to as many as possible, as well as to increase the federal tax base in order to provide higher quality public services. This interaction focuses on expanding the economic base, thus bringing economic development and strengthening the economy against economic shocks. The state interactions follow the Pareto efficiency rule which incorporates the idea of making at least one individual (in this case the state) better off without making any others worse off. The states keep on interacting until there is no further scope for Pareto improvement.

Export income

According to the exogenous growth theory economic development results from creation and retention of primary jobs or increasing the amount of income coming into the community from outside its market area. The theory suggests that growth is the result of external resources defined by export income when dealing with state-to-state international coordination.

Proponents of economic development argue that growth is the result of capital inflow from foreign resources and not the money circulating within the local community. Thus, the biggest economic incentive for international state-to-state cooperation is to multiply the foreign capital inflow.

Social benefits

It is not only economic benefits that form the basis of state interactions; it is also social benefits which shape international relations. The world has changed into a global village and the degree of interdependency has greatly increased. This greater interdependence has resulted into ever increasing social benefits through coordination and cooperation.

Social benefits are difficult to calculate and therefore are often over looked but they yield long term results. According to the social constructivist theory of International Relations social interactions and communication are critical in establishing the international system. As the collaboration and cooperation frameworks among the state and sister states increase, the common cultural values develop and these enhance the channels for further cooperation.

4. Macroeconomic view

The Fig.1 depicts economic activities of a State from macroeconomic perspective. Key players are Government, individuals, and businesses. The market has two components: the resource market & the product market. The resource is comprised of capital (K) and labour (L), in which individuals supply, and businesses and government demand - K&L. The product market is comprised of all the tangible and intangible products of the economic activities, whereby businesses are suppliers and government & individuals are buyers. Fund, '$', represents the monetary unit exchanged between parties involved in transactions. For simplicity, we initially, assume that the economy is closed and the government budget is balanced.

Individuals receive income from resource markets by supplying labour (employment). Income acquired is distributed in the Goods & Services (G&S) market via purchase of market products and services, to government via taxes. The remainder is channelled to resource market in the form of savings/investment.
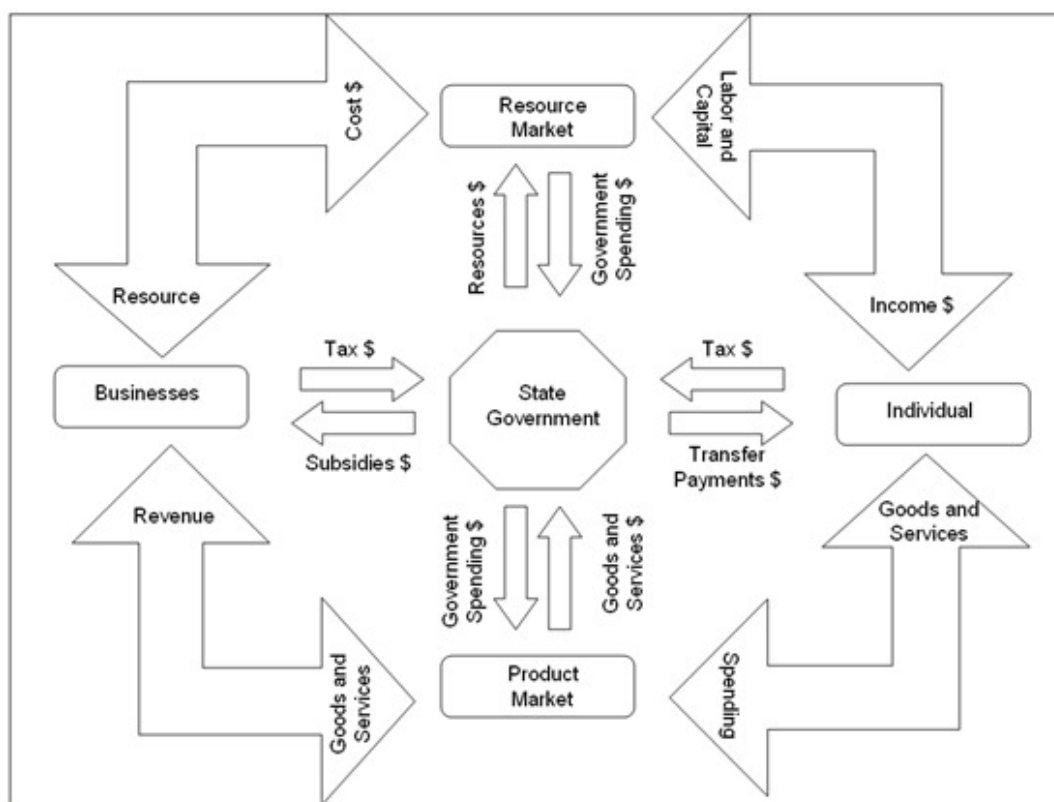

Fig. 1. Macroeconomic Framework for State Government (Source: own creation).

Similarly, businesses borrow money and hire employees from the resource market. Then, they sell their products to individuals and government in the G&S market. Therefore, they receive revenue from selling G&S to individuals and government, and make payment to government via taxes and to individuals via salary.

Lastly, government receives income from the businesses and individuals in the form of taxes. Some of taxes are used to consumer G&S via discretionary or development activities, while remaining tax revenue is used to give back to businesses or individuals via subsidies.

In summary, by tracing the flow of funds due to economic activities within the 'resource market' and 'goods and services market' among individuals, businesses, and government, we can draw a macroeconomic picture of a State. Under the assumption of a closed economy, expansion of such

economy is limited; however, when we relax this assumption to an open economy, expansion of the economy becomes feasible.

An economy expands when the resource market and G&S market become larger. Trade with partners outside the political border, as such, provides such an opportunity. International trade can increase the volume of the resource market and G&S market in the domestic market. Such expansion will create more tax, income, and revenue for government, individuals, and businesses respectively.

For example, growth in export means local businesses produce more tangible and intangible goods and sell it in foreign market. As discussed above, an increase in business production means more revenue for government and more income for individuals.

Export can have a two-fold effect in the resource market. i) It can increase income of individuals, therefore, increasing saving/investment. ii) The resource market can benefit from foreign investment in the domestic market which will also make the resource market larger.

The macroeconomic activities of any economy are depicted in the diagram provided as discussed above. When two economies are involved in trade, we observe an increase in the volume of both the resource and G&S market. While there is a plethora of literature on benefit of international trade, theory on opportunity cost best explains these benefits.

Table 1. Before International Trade.

Economy A			Economy B			
Item	Input	Output	Item	Input	Output	Total
X	10	100	X	10	50	150
Y	10	50	Y	10	100	150

Source: own creation.

Table 2. After International Trade.

Economy A			Economy B			Total
Item	Input	Output	Item	Input	Output	
X	20	200	X	0	0	200
Y	0	0	Y	20	200	200

Source: own creation.

We see that in Table 1, before international trade the two economies produced 150 'X' & 150 'Y'; whereas in Table 2, after international trade they produced 200 of each. This example illustrates that international trade can increase the G&S market in both the participating economies.

4.1 Implication of macroeconomic theory in SSR

Economic growth is one of the important goals of every government. As mentioned earlier, one way to expand economic activities is to increase the resource market and the G&S market via international trade. SSRs can play an important role in facilitating such trade and work as a catalyst in increasing the size of the economy.

As stated above both the economies have the same key players in the economy and the flow of funds within the market is also similar at their macro-level[49]. An expansion of economies occurs when resources and G&S from one economy are allowed to transfer to the other; when individuals and businesses from one economy have access to their counterparts in the other economy. Such flow without major hurdle can benefit mutually. Government with its overarching goal, political will, and resources therefore become an important agent for such expansion.

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[49] The degree of influence of players can vary depending upon social and political structure of the economy.

With regard to the resources and G&S markets, government via SSRs can facilitate remove barriers between two economies. Methods to remove such barriers include: free-trade agreements, lowering trade barriers, providing incentives for international trade, and the like. Similarly, attracting foreign companies to open factories, and providing incentives to make investment in local development are other recommended policies.

With regard to individuals and businesses, while the above mentioned methods are purely from an economic perspective and focus on resource and G&S markets, SSRs can also play an important role in facilitating non-economic yet socially beneficial activities. Facilitating exchange of entrepreneurs, education, and cultural knowledge can have positive effect in general economy. For example, educational exchange between two parties of different economies can make trade processes easier providing higher benefit to the economy. Education itself can be part of the services market. Similarly, entrepreneurs of the two economies can learn from each other. Mechanisms that would facilitate connection between individuals and businesses is something SSR can encourage.

5. Evaluating sister state relations

5.1 Lessons from past

The 'lesson-drawing' is a process of learning lesson from current experience in other countries to improve national policy-as a future-oriented approach (Rose, 1991). This notion postulates that the desire of many developing countries to achieve a Scandinavian standard of living does not mean that this can be done simply by enacting Nordic welfare state legislation. In fact, lesson-drawing differs from the spread of big ideas; instead, it is about contingencies: under what circumstances and to what extent will a program that worked abroad will work here? Therefore, it encourages policymakers to be skeptical about assuming that so-called 'best practice' policies can readily be adopted, but it also encourages skepticism about arguments that what is done there can never happen here. We recommend the following eighth steps to policy makers who use lesson-drawing approach to formulate programs.

1. Problem Identification
2. Choosing the appropriate partner for lesson learnt
3. Learn how the program was implemented by the partner and how it worked
4. Define the Key Performance Indicators (KPIs)
5. Design the learning taking care of the local context
6. Monitoring & Evaluation during the implementation phase
7. Adjusting the delinquencies
8. Converting the lesson drawing into standard practice.

5.2 Approach to economic input output model

Evaluation of SSR between two states can be undertaken by using fairly simple Input-Output model. An input-output model is a quantitative economic technique that represents the interdependencies between different branches of national economy or between branches of different economies. The structure of the input-output model has been incorporated into national accounting in many developed countries, studying regional economies within a nation, and performing national and regional economic planning. Indeed the main use of input-output analysis is for measuring the economic impacts of events. As such, the IO Model can be an effective tool to evaluate SSRs.

Data required for such evaluation can be readily obtained with the Bureau of Statistics. Most of the world's economies, classify economic data under 17 sectors as per International Standard Industrial Classification of all Economic Activities (United Nations, 2011).

The application of the IO model on SSR is comprised on two steps. First, we establish the relationship between industry sectors within the economy of the State and second, we will establish the relationship between the same industry sectors of the State and Sister States.

5.3 Two industry sectors of the same economy

In an economy, an industry sector uses inputs and produces output. Furthermore, input of one industry is output for another. Finally, the remaining outputs are used in final consumption by consumers. Therefore, we will discuss output of an industry as the intermediary input and final consumption.

Demand For Industry i for good x

$$xi = xij + di \tag{1}$$

xi: output of industry I, *xij*: output of industry i sold to industry j, *di*: output of industry i sold to final demand

Inter-industry Demand for good x

$$xij = aij \times xj \tag{2}$$

xj: output of industry j, *xij*: output of industry i sold to industry j, *aij* : input output coefficient $0 \leq aij \leq 1$

Total Demand of good x

$$xi = xij + di \tag{3}$$

The above equation can be re-written as

$$xi = ai1\ xi + ai2x2 + \dots + ain\ xn + di \tag{4}$$

where *n* is number of sectors, *xi* is the single homogenous good 'i', *aij* is the unit that sector 'i' uses from sector 'j' to produce 1 unit of xi and di is final consumption in the market.

5.4 Theory of comparative advantage

As discussed in the macroeconomic overview, the trade between two economies can enlarge the services market and G&S market. Suppose we are interested in influencing an increase in trade in one sector between State XX and Sister State XY and we have the information on how changes in production, that is, an increase in the services or G&S market, in XX and XY affect the demand for each other's output. If production and export in XX increases, this will subsequently increase the income. The residents will decide how much of their income they will spend, where, and for what. Some of the spending will be for goods and services that are produced locally. Therefore, we can see the multipliers effect in income, employment and output.

While there are several of kinds of IO models available, the Bureau of Economic Analysis's (BEA) Regional Input-Output Modelling System (RIMS) is widely used. In addition, RIMS uses International Standard Industrial Classification (ISIC) of all Economic Activities, the ISIC is issued by the United Nations.

International Standard Industrial Classification of all Economic Activities include following 17 Industry Sectors:

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A Agriculture, Forestry and Fishing
B Mining
C Manufacturing
D Electricity, Gas and Water Supply
E Construction
F Wholesale Trade
G Retail Trade
H Accommodation, Cafes and Restaurants
I Transport and Storage
J Communication Services
K Finance and Insurance
L Property and Business Services
M Government Administration and Defence
N Education
O Health and Community Services
P Cultural and Recreational Services
Q Personal and Other Services

6. Conclusion

As a policy recommendation a seven step 'International Policy Framework' is recommended that will enable any department within the State Government to strategically develop international linkages creating well-balanced relationships:

Step – 1
Identify a state or sister state to develop international linkages. The criterion for selection should be based on either opportunistic selection or research based approach to satisfy economic or social objectives of the State.

Step – 2
Identify the relevant sectors of interest within the target state from the total of 17 Industrial Sectors (as discussed above). The criterion for identification should be the state needs or opportunities that may arise as a result of cooperation.

Step – 3
Identify the nodal infrastructure within the target state and seek arrangements to connect it with local nodes. In case there is more than one nodal connection available value core nodes more than the periphery. This arrangement is based on the assumption that core nodes are less costly and yield greater economic benefits.

Step – 4
Identify peer connections within selected sectors and maintain transnational peer to peer relations with such connections. This arrangement is expected to reduce transaction costs.

Step – 5
Arrange social networking events preferably co-sponsored, which build up on transnational relations established earlier.

Step – 6
Identify transnational relations which are productive and have been very active throughout the term. Mature such interactions with formal contracts, making state agreements which are long lasting. This will thus further reduce the transaction costs.

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Step – 7
Develop a general framework to evaluate the agreements and relations:
Logic Model
Establish short term, medium term and long term goals,
Identify activities to be performed segregated evenly over the span of time
Identify indicators that will be used for evaluation purposes.

For trade specific projects use economic input output model to quantify the benefits and costs. Few available IO models in the market are REDYN, IMPLAN and RIMS-II used by Bureau of Economic Analysis (BEA US). For social programs use cost and benefits analysis, or lesson drawings from the past.

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