ECONOMIC CONTEXT OF EUROPEAN SUBSIDIES AND THEIR IMPACT ON REGIONAL ECONOMIC DISPARITIES ON THE EXAMPLE OF THE CZECH REPUBLIC

Kristýna Brzáková, Jiří Kraft

Introduction

European Union allocated 513 billion CZK through the European Structural and Investment funds (ESI) to the Czech Republic during the previous programming period of the European Union (EU) (i.e. 2007-2013) based on data of Ministry of Regional Development CZ (MRD CZ) (MRD CZ, 2015a). The amount of money was allocated to the renewal of decaying residential, tourist and civic brownfields, to educate people, to support businesses, educational institutions, agriculture and generally support the lagging regions that are below the average of gross domestic product (GDP) in the EU25. Although members of EU are based on market economy, the rate of redistribution reaches some 50% of GDP through public finance system (Martinčík, 2002). The EU has a totality of 5 + 2 different funds nowadays. Incomes of the EU budget mostly generate payments quantified from gross national income and payments calculated from the total amount of value-added tax from each member state. The EU budget was divided into six main areas of expenditure in 2014. The largest share was spent on Smart and Inclusive Growth (44.9%) and Sustainable Growth: Natural Resources (41.6%) (EU, 2015). Payments of the Czech Republic are lower towards the European budget than the value of the allocation; also the Czech Republic belongs to so-called net beneficiaries. Incomes from the EU budget amounted to almost triple, compared to the Czech payments to the EU budget in 2014 (EU, 2015). Regions that were below 75% of the EU25 average GDP could request subsidies from objective 1 – Convergence (MRD CZ, 2015b). It is necessary to ask whether such high subsidies in various forms has the theoretical background and whether it contributes to the objectives of European integration and regional convergence as well as leads to a convergence of economic level of the Czech regions, regardless of how efficiently or inefficiently allocated amounts are used.

Subsidies usually take the form of non-repayable financial aid. It is provided by the EU budget, through the Czech Ministry of Finance and through the individual managing institutions. Partly co-finance of a project is a common requirement from the European Union, both from the Czech budget and from the budget of the private funding of individual beneficiaries. The subsidy is non-reimbursable financial support under set conditions as the budgetary rules of the Czech Republic says. It is very difficult to find the generally accepted definition of subsidy. Each institution explains subsidy differently. According to an analysis conducted by Rubini, the definition of "subsidy" is not fully covered by European Commission's regulations, although it is defined as "any support granted by the State or through the state resources in any form" (Rubini, 2010). According to the Report of the World Trade Organization in 2006, subsidy is defined as "governmental transfer of money into the private sector" (World Trade Organization, 2006). According to International Financial Reporting Standards, subsidy covers a "broad range of funds paid by the government for various purposes." It talks about the subsidy in the context of "payments of the subsidy's provider to an organization that will use this grant for a specific purpose" (Audit and Assurance Faculty, 2010, p. 66). According to the Czech Act no. 218/2000 Coll., on budgetary rules, subsidies are "funds of the state budget, state financial assets or the National Fund provided legal entity or individual for a specified purpose" (Czech, 2000).

The first mention of subsidies is listed historically in the Paris Treaty (European Coal and Steel Community, 1951) that mentions the possible financial support in the form of loans or non-repayable grants. Nowadays, ESI is embedded in the Consolidated Version of Treaty on the Functioning of the European Union (EU, 2012). There are the basic tasks of three EU funds according to the EU legal act: "The European Regional Development Fund is intended to help to redress the main regional imbalances in the Union through participation in the development and structural adjustment of regions whose development is lagging behind and in the conversion of declining industrial regions." (EU, 2012); The European Social Fund is established "to improve employment opportunities for workers in the internal market and to contribute thereby to raising the standard of living" (EU, 2012); The Cohesion Fund will provide a "financial contribution to projects in the fields of environment and trans-European networks in the area of transport infrastructure" (EU, 2012).

Each Member State that seeks to obtain subsidies from the EU budget must prepare a draft of programs for the upcoming time period that must be approved by the European Commission. The Partnership Agreement is a document approved for the programming period 2014-2020 (MRD CZ, 2014). In the strategic document are specified operational programs, their priority axes, priorities and specific objectives, outputs and output indicators.

Intentions of ESI cover a wide range of topics and areas to which they contribute. These brief general descriptions suggest targeting on the region, employment, education, living standards, cross-border infrastructure and the environment. All areas of support are directed to the goal of economic convergence of Member States. Accepting the above definitions, treaties and other EU regulations, subsidy may be defined as a specific financial contribution, which will contribute to economic and social development of the Member States and regions, and thereby reduce the significant regional disparities between prosperous and lagging regions.

In this moment, there is appropriate to ask whether the subsidies are needed to support the integration process. Opening up markets between EU Member States (elimination of laws and customs barriers) increases competition, pushing on further increasing of the efficiency of production (MacDonald, 1994), and States may buy raw materials and semi-finished products under better conditions. It leads consequently to increasing the efficiency of production (Lee, 1992). It can be expected that there will be changes in the quality and quantity of production inputs due to better mobility of inputs and increasing technical progress (Maudos et al., 1999). Empirics show different results in literature and a convergence between EU countries is not stable. Author Delsi (2009) analyses the convergence at the bases of the level of production efficiency and income per capita. The results of his work do not adduce evidence of convergence over the whole time period; results vary according to multiple sub-periods. Similarly, Delgado-Rodriguez and Alvares-Ayuso (2008) analyze labor productivity by using β-convergence and identify significant convergence periods (1986-1992 and 1997-2001) and periods without significant convergence (1980-1985 and 1993-1996). Authors Martinčik and Šlehoferová (2014) used both β- and σ-convergences on the Czech regions during the time period 2005-2011. They concluded in analysis of β-convergence with that total number of regional convergences is more than three times bigger than the number of divergences. Author Landau (1995) presents the results of his research that proves integration does not bring any positive effect on economic growth. Conversely, Henrekson et al. (1997) reported the results of research that integration has a permanent effect on increasing GDP growth rate in value from 0.6% to 1.3% per annum. Integration affects the income per capita through an investment and a technological spill-over (technological channels) (Henrekson, 1997; Maudos et al, 1999). Badinger (2008) concludes that the integration of 44% has an effect on GDP per capita based on the analysis of panel data using co-integration approach. However, he notes the average speed of adjustment is significantly faster in technology (14.3%) than investments (2.5%) in most countries. Similarly, in his earlier work he comes to the conclusion that integration has a 25% impact on GDP per capita, and if European integration hadn't been carried out since 1950, GDP per capita would have been about 1/5 lower than it is in the EU today (Badinger, 2005). Based on these results, it is possible to conclude that integration brings

advantages in the long term perspective, which has a positive impact on the economic growth of the Member States, and the spill-over of technology has a faster impact than the spill-over of investments. It seems desirable to increase the level of EU integration or in the process of integration, continue (Pastor, 2012).

The number of instruments of economic integration operates in the EU and one of them is subsidies from ESI. However, it is not entirely clear whether these EU instruments have a positive effect on the convergence of EU Member States and, therefore, their regions. The integration of the Member States is most often evaluated on the basis of the produced GDP and income level in the regions or states.

One analysis about the impact of subsidies on the integration is submitted by authors Boldrin et al. (2001); however, they found no evidence that ESI has a significant impact on reducing income inequality among EU regions. Contrarly, Leonardi (2006) argues that roughly ⅓ of the original NUTS 2 level regions falling under Objective 1 reached the level of GDP higher than 75% of the European average of the EU15 during the period 1988-2003. Therefore, thanks to EU regional policy, the level of regional disparities reduces in the terms of GDP. Earlier empirical research based on OLS analysis present a very slow real convergence of European regions. It was around 2-3% per year in the years 1960-1970, some 1.7% after 1975 (Badinger et al., 2004). Effectiveness of European regional policy varies depending on country and region of the EU, as evidenced by authors Sapir et al. (2004) who argue that the bulk of real convergence was centred in Ireland and East Germany from 1980-2002, while, for example, Spain, Greece and Portugal recorded only modest growth in some regions, and other regions, no growth. Puga (2002) further argues that income inequality decreased by 25% among EU countries in the period 1982 to 1995, while among regions, income inequality increased by 10%.

Support from the European Union as a transnational "government" institution in the form of subsidies could lead to a gradual convergence of income of the population. Based on the above, it can be assumed that the spill-over and promotion of new technologies have an impact on GDP growth and income growth of the population, especially in lagging countries of the European Union.

1. Theoretical Approaches of Economists to the Issue of Subsidies

Economic schools are divided into two principally different groups. The first group – liberal – does not permit the implementation of the redistribution process in principle because it relies on market self-regulation. Intervention in the form of subsidies is perceived as a complication to promote spontaneous processes. Furthermore, the redistribution is always at the expense of one side, particularly the source of redistributed funds, at least, initially. The redistributive process likely leads to an increase of the product on the recipient, but it likely decreases income growth of the provider. For objectivity, it is necessary to mention that the above argument would not be relevant in case of the provider's over-investment, which usually ends with economic recession. Subsidies can also lead to the growth of demand of the net recipients' countries for the products of the net payers countries that could imply earnings growth of scale associated with a reduction in unit costs of production for the net payers' countries under certain circumstances. There is a group of economic schools on the other side that can be described as dirigist. Generally, these schools accept the market self-regulating mechanism, but they express serious doubts about its functioning in the imperfect competition in the contemporary world economy.

There are several different theories from the perspective of the economic schools, which do not justify subsidy interventions as an appropriate intervention to the economy, but agree to invest in lagging areas more than in developed areas. One of the most important theories includes the theory of endogenous growth, based on neoclassical economic theory. The origin of endogenous growth theory comes from authors Romero (1986), and Lucas (1988) and even earlier Solow (1956). The Solow model explains that only technology change leads to economic growth. Firms relocate production to less expensive locations due to the different labour costs, thereby increasing the inflow of capital and technology to these countries. It enhances the trade and the change of the production place of the companies without additional barriers in the context of the European Union as a borderless area (Jones et al., 2012). Romer and Lucas explain economic

development as a result of the growing capital in the economy. The authors consider capital generally as a human and physical capital. Also, they assume technology as a private product and argue that technological change is achieved by efforts of businesses. Their approach also shows the return on capital may not show a decline in the terms of economic development, because the technological knowledge expanding among producers in the form of positive externality. Similarly, investment in human capital can be considered as a positive externality because of the portability of knowledge among people. Lucas (2009) further argues that even expansion of ideas between people and societies has a positive effect on economic growth.

Therefore, supporters of all schools acknowledge a need to help the market mechanism because passivity could lead to a big delay of economic growth. Therefore, it is desirable to help the lagging regions of the world and the EU regions in economic growth through a redistribution funding process. The economic growth in the European Union could, therefore, accelerate as a whole. The different levels of the marginal product of inputs in the advanced and lagging economies could be considered. This idea would promote the redistributive processes.

Convergence theory also argues the same volume of capital in the production is reflected in higher GDP growth rate in the poorer countries than in the richer economies. This consideration is not always confirmed in economic realities. The above-defined effects may subsequently impact the amount of knowledge throughout the EU economic area and its economic growth (GDP). Specifically, β-convergence and σ-convergence explain convergence or divergence disparities of wealth and economic growth in particular on the basis of real GDP per capita (Nevi et al., 2011).

According to Musgrave (1959), there are three basic activities of the phenomenon of a state and its role: Allocation due to externalities, redistribution of wealth in terms of social equality and, finally, stabilization. Another role – Regulatory – adds later Bailey (2002). The EU takes over the role of the state in the form of redistribution of subsidies. Subsidies granted by the European Union represent the fulfilment of a stabilizing role through fiscal policy, which seeks to achieve goals such as full employment, price stability, economic growth and balance of payments. At the same time, subsidies can be viewed as fulfilling the role of redistribution, because the less developed regions get more funds, while the more developed regions pay more to the budget. These arguments provide a clear justification for state or supranational/ European intervention in the economy (El-Agra, 2013). In the summary, it can be stated that the economic theory perceives investing positively in lagging areas. But they differ on whether to keep the redistribution process of investments on a market basis, or to realize it through the state or supranational funding intervention. Implemented subsidies may initiate spontaneous investment through the market.

2. Objectives and Methods

The aim of this paper is to demonstrate the effect of European subsidies on the convergence of the economic level of the selected sample Czech regions. Attention was focused on subsidies from the Operational Programme Enterprise and Innovation (OP PI), which was aimed at developing technologies, the introduction of the technology into production, market penetration, etc. This operational program generated new technologies and their dissemination among clusters and protected new ideas and technologies in the form of patents and trademarks. Amount of paid subsidy from the OP PI in the Czech regions was the indicator for analysis. Each subsidy was classified according to region of allocation; therefore, location of the investment inflow. The location of the project implementation was chosen deliberately because it can vary from the main place of business entity. It is precise amounts already paid from the OP PI to individual beneficiaries. Values were collected for all regions of the Czech Republic (13 regions in total) except Prague, since the OP PI has not been allocated there. The data source was the project database and statistics of grants from the OP PI according to CzechInvest Agency (2015). The reason for the chosen indicators – the value of the grants paid from the OP PI – is its focus on business development, new technologies, business innovation, and supporting scientific research activities. Amount of subsidies from the OP PI reflects the level of investment in new technologies and innovation in business.

The second indicator is the level of populational income in each region of the Czech Republic, which reflects the convergence of the economic level of the regions the most. It is an indicator of the monthly average income per capita in the business sector, calculated on the number of individuals in the region for the period Q1 2011 – Q3 2015. Data was collected for all regions of the Czech Republic (14 regions in total) including Prague. The reason for selecting incomes per capita only from the business sector is its linkage to subsidies from the OP PI, which is allocated to the businesses. The data source was the Czech Statistical Office (CZSO) and the Public Database (CZSO, 2015).

Both indicators are analyzed in the period Q1 2011 – Q3 2015 for the 13 Czech regions (From 2014, while preparing the new Operational Programme Enterprise and Innovation for Competitiveness (OP PIK), but by the end of 2015 the OP PIK paid no subsidies to beneficiaries yet. The OP PIK would not affect the selected indicators and their values in the selected period).

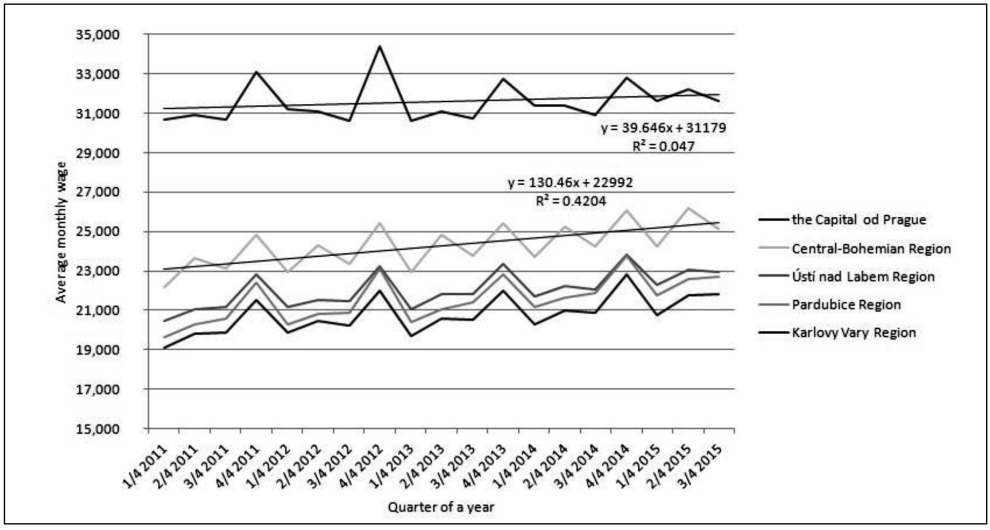
First, an analysis of time series of both indicators was conducted and their results were interpreted. To demonstrate the relationship between these variables were then conducted a test of relationship and Pearson's correlation coefficient were conducted. Results were evaluated at a significance level of 1% and 5%. Autocorrelation of time series data has been checked by Durbin-Watson test on the significant level of 5%.

As an indicator of economic approximation of individual regions of the Czech Republic was chosen indicator, the level of incomes per capita, this was simultaneously compared to the most developed region such as the City of Prague. Allocation of the OP PI outside the Prague region should help to get other regions closer in economic level and even address regional imbalances.

3. Results

Trend and regression analysis initially evaluated the development of average monthly incomes per capita for 19 periods, from Q1 2011 to Q3 2015. All regions of the country reported growth of average monthly income per capita in the time period. The size of growth, comparing the situation of Q3 2015 to Q1 2011 is considerably different between the City of Prague and other Czech regions. While in the capital, Prague, amounts to 3.05%, growth in monthly average income varies in interval <12.07%; 15.69%> in other regions. The minimum was measured in the Usti region; the maximum growth recorded Pardubice region. Based on the data, progress

Fig. 1: **The trend and regression analysis of income per capita in the selected Czech regions**



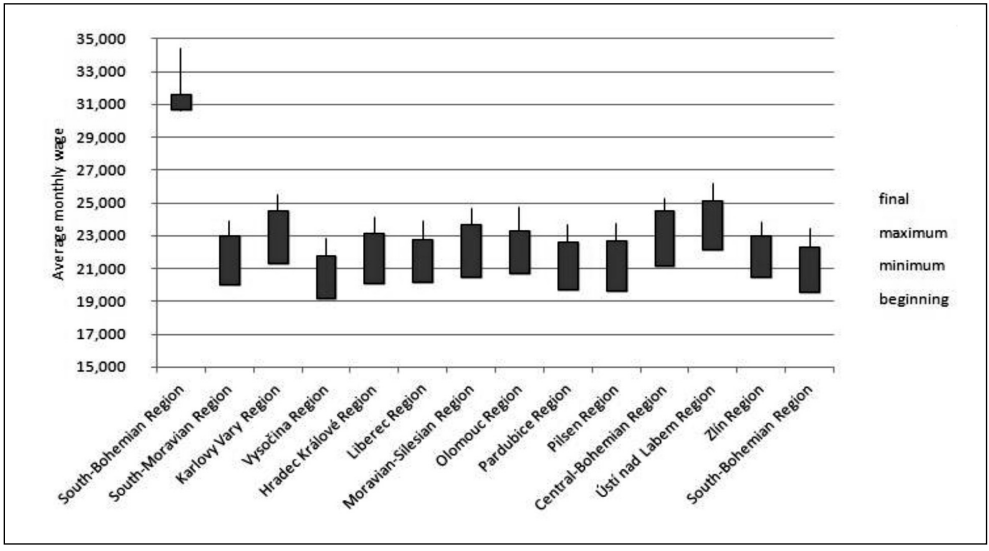
Source: own preparation based on CZSO data (CZSO, 2015)

it can be stated that the average income in other regions is increasing, slowly approaching the level of income in Prague. However, the level of monthly average income in the capital city of Prague still stands at about 45% higher at the end of the time period than in Karlovy Vary region, where monthly average income are at the lowest level in the country. Fig. 1 presents only selected regions which are most interested in this analysis.

Progress of income, which has a relatively low increase in the capital, Prague, can be caused by grants from the OP PI that have not been allocated in the City of Prague. Regarding the quarterly fluctuations throughout the development, they can be seen as the tops of the line in Fig. 1, so they may be caused due to the increase in bonuses in the last quarter of each year. The exception is the Central Region, which increases the average salary in half year as well. The reason may be bonuses paid twice a year, which makes, for example, Skoda Auto a.s. Increase in average income per capita in the Central Region compared to other regions may cause Skoda Auto a.s., on the one hand, to pay the highest wages in the region, and, on the other hand, cause a large number of people who permanently reside in the Central Region, but they work and receive wages in Prague.

Fig. 2 represents the beginning, minimum, maximum and the final amount of income per capita for the selected time period in regions. Beginning equal to the value achieved minimum in almost all cases. There is a significant less overall income increase in capital city of Prague compared to the other regions. In contrast, the capital city of Prague achieves significant fluctuation of the maximum income.

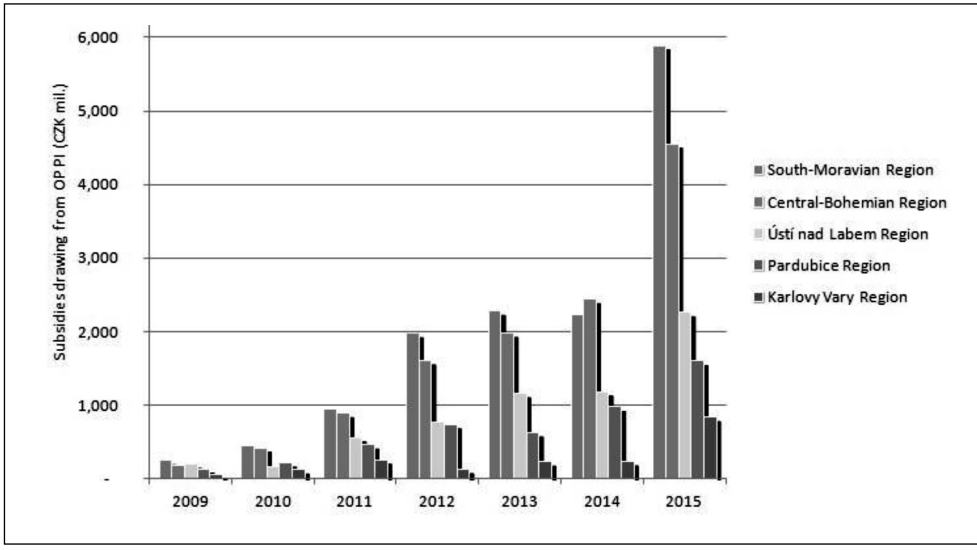
Fig. 2: Stock chart changes in the level of income per capita for the whole period in the Czech regions



Source: own based on CZSO data (CZSO, 2015)

Fig. 3 shows the progress of drawing funds from the OP PI in the selected Czech regions except the City of Prague (there has not been OPPI allocated). In 2007, the budget period began but the first subsidy to the beneficiaries was paid in 2009. This may be caused by delay of implementing bodies in the preparation of the OP PI, as it was the same case with the OP PIK and also time delay that arises between a moment the call is published and the date grant is paid to beneficiaries. Based on the results, delay of about one year in the implementation of the program can be assumed. The times lag between call and grant payment may take two

Fig. 3: **Development of paid subsidies from the OP PI for the whole period of its implementation of 2007-2013, respectively up to 2015 in the selected Czech regions**



Source: own preparation based on MIT data (MIT, 2015)

years. The most important indicator is the value of subsidies paid in the last year, in 2015, in which the values sometimes double the amount of previous years. The great example is the South-Moravian Region. This fact can be attributed to the completion of the program in 2015 and thus also the paying of the final payment requests. But at the same time it can be deduced that the management and implementation bodies of the OP PI began to run through the entire approved budget in recent years due to a deadline of the drawdown. Another reason could also be that applicants were significantly fewer in the first years of the OP PI.

The last phase of the research was the correlation analysis; the results are illustrated in Tab. 1. Correlation level between income per capita and the amount of grants paid from the OP PI in Czech regions, except the capital, Prague, for the period Q1 2007 – Q3 2015 was conducted using Pearson's correlation coefficient. According to Hindls et al. (2007), high strength of the correlation relationship (0.7, 1) is expressed only in the Central Region (SCK), medium strength correlation relationship is expressed in the Vysocina Region, the Liberec Region (LBK) and the Usti Region (0.3, 0.7) to significance level of 5% and 1%. Correlation relationship in the South Moravian region was confirmed only at a significance level of 5% of the medium strength of correlation coefficient. Durbin-Watson test of time series data autocorrelation has been made and confirm evidence of independency of residuals.

It could play a significant role in the total amount of subsidies depleted in these regions. For example, the total budget for the period is extended with a drawdown period (2007-2015) worth nearly CZK 2 billion in the Karlovy Vary Region (KVK); it was almost CZK 4 billion in LBK and a total of 12 billion CZK in SCK. The size of the region could provide a good reason why the region drew a disproportionate amount of the grant. The KVK area is the second smallest region after the LBK and is the smallest region in terms of population. The LBK, however, drew twice as much as the KVK. The reason could be the lack of activity of potential applicants in the region or inappropriate targeting of OP PI. The OP PI was not targeted in areas in which the KVK (spas, social services and metallurgic industry) dominates. Another reason for drawing substantially lower amounts in the KVK may be a small number of businesses.

Tab. 1: **Correlation in selected regions of the Czech Republic – the relationship between income per capita level and the amount of subsidy**

	Level of significance			0.05	0.01
	Critical value			2.11	2.898
	Pearson coefficient	Sr	t		
South-Bohemian Region	0.338	0.228	1.480	**NO**	**NO**
South-Moravian Region	0.496	0.211	2.353	**YES**	**NO**
Karlovy Vary Region	0.435	0.218	1.993	**NO**	**NO**
Vysočina Region	**0.586**	**0.197**	**2.983**	**YES**	**YES**
Hradec Králové Region	0.391	0.223	1.753	**NO**	**NO**
Liberec Region	**0.585**	**0.197**	**2.971**	**YES**	**YES**
Moravian-Silesian Region	0.413	0.221	1.871	**NO**	**NO**
Olomouc Region	0.387	0.224	1.731	**NO**	**NO**
Pardubice Region	0.352	0.227	1.549	**NO**	**NO**
Pilsen Region	0.273	0.233	1.171	**NO**	**NO**
Central-Bohemian Region	**0.828**	**0.136**	**6.097**	**YES**	**YES**
Ústí nad Labem Region	**0.614**	**0.192**	**3.204**	**YES**	**YES**
Zlín Region	0.449	0.217	2.073	**NO**	**NO**

Source: own

Subsidies from the OP PI are paid to economic entities, but the KVK has a total of about ½ less active businesses than the SCK (ČSÚ, 2014). After a calculation subsidy for one subject, companies n the KVK (3 ths. CZK / 1 subject) were evaluated lower rate subsidies than in the SCK (8 ths. CZK / 1 subject) and the LBK (5 ths. CZK / 1 subject). It confirms the consideration of insufficient activity of economic subjects in KVK in applications for subsidies from the OP PI.

Results of the analysis indicate inconsistency in the claim that there is an interdependence between the value of drawing funds from the OP PI and the progress of income level in the regions of the Czech Republic. There is a region (SCK), whose relationship between the variables presents a high level of correlation coefficient both at a significance level of 5% and 1%, as well as a greater number of regions in which interdependence can be rejected.

4. Discussion

Prior studies have evaluated the economic convergence of European countries on the level of GDP, mostly over a long period of time. Other research studies have analysed the impact of European funds on the integration of European regions. None of these studies has presented data from countries that entered the EU in 2004. Furthermore, these prior studies did not use data on a regional level within one country.

This paper aims to assess the impact of subsidies from the ESI on the economic level of the population of each region in the Czech Republic within the time period from Q1 2007 to Q3 2015. The analysis of the time series analysis and the Pearson correlation coefficient were used for the assessment. Autocorrelation has been rejected by the Durbin-Watson test. On the issue of measuring the contribution of regional aid, the regional multiplier method has also been used. Machacek et al. (2013) admit the possibility of using a regional multiplier as a tool to measure the impact and effect of financial injections from various programs and projects of regional aid.

This paper is based on a theoretical demonstration of the effects of technological investments as a tool to help economic growth. Subsidies from OP PI are investment funds allocated to technologies in different regions of the Czech Republic; economic growth is evidenced by the progress of the average monthly income per capita in these regions.

It should be noted that the analysis does not take into account the time lag between the intervention and its impact on the economy nor the fact that it evaluates only one operational program in one EU member state.

Using a correlation analysis, no correlation between the amount of subsidies from the OP PI and the trend of the average monthly income per capita was demonstrated in the NUTS 3 regions in the selected time period. Firstly, a positive correlation relationship and a high and medium degree of correlation coefficients were found in some regions. However, it was ascertained that such a relationship was not proven at all in a significantly larger number of regions. The previous research performed by Boldrin et al. (2001) reached the same results on the impact of subsidies on the integration. They found no evidence that ESI has a significant impact on reducing income inequality among EU regions. Puga (2002) further argues that income inequality decreased by 25% among EU countries in the 1982 to 1995 time period, while among the regions, income inequality increased by 10%. Other research performed by Bouvet (2010) shows evidence of increasing income inequality in the poorer countries where the common EU currency has been adopted. However, it has no significant evidence of such an effect in the rich countries of the EU.

Conclusions

The EU's aim is to contribute through financial support from the ESI funds to regional development, increasing employment, education and living standards, to develop cross-border infrastructure and to environmental protection. The objectives of these areas should lead to economic convergence and reducing the differences in the economic level of EU Member States and regions.

The phenomenon of subsidies and redistributive processes is a traditional dispute between dirigiste and liberal economists. Opinions are both for and against the implementation of grants. Subsidies, even as an economic phenomenon not fully uniformly defined, are in the economic reality of the EU. Their statistically significant effects on the settlement of the unbalanced situation of residents' income were not proved in this paper on a selected sample of NUTS 3 regions in the Czech Republic.

Correlation level between income per capita and the amount of grants paid from the OP PI in Czech regions, except the capital, Prague, for the period Q1 2007 – Q3 2015 was conducted using Pearson's correlation coefficient. According to Hindls et al. (2007), high strength of the correlation relationship (0.7, 1) is expressed only in the Central Region, medium strength correlation relationship is expressed in the Vysocina Region, the Liberec Region and the Usti Region (0.3, 0.7) to significance level of 5% and 1%. Correlation relationship in the South Moravian region was confirmed only at a significance level of 5% of the medium strength of correlation coefficient. Results of the analysis indicate inconsistency in the claim that there is an interdependence between the value of drawing funds from the OP PI and the progress of income level in the regions of the Czech Republic. There is a region (SCK), whose relationship between the variables presents a high level of correlation coefficient both at a significance level of 5% and 1%, as well as a greater number of regions in which interdependence can be rejected.

On the other hand, it must also be emphasized that in this analysis, only one macroeconomic indicator was considered – the amount of income – and in the future the authors could consider extending the analysis to other relevant indicators of economic regional development.

To reach the relevant conclusions about the phenomenon of subsidies in the EU and the whole reallocation, it would also be appropriate to take into account other operational programs at the national level which were implemented in that time horizon and the transnational and international programs. It should also be taken into account that in addition, there are other forms of business investment support, e.g. in the form of investment incentives and tax breaks in the Czech Republic.

But what is crucial and should be the subject of further scientific investigation is the problem of considering both sides of the redistribution process. Thus, it's not just about exploring the effects of subsidies whose benefits so far appear to be ambiguous, but also considering the effect of reducing the production performance of the bodies from which the finances were drawn for the subsidy. It is, therefore an overall effect of redistribution processes on the regional economy, the member states but also the EU and its competitiveness compared to other economic centres of the world.

The article was prepared with an institutional support of the long-term conceptual development of the Faculty of Economics, Technical University of Liberec, in the framework of the project Excellent Research Teams – Regional Development of the Czech Republic in the Context of the Onset of the Fourth Industrial Revolution.

References

Audit and Assurance Faculty. (2010). *Framework document for accountants report on the utilization of subsidies.* Chamber of auditors Czech Republic. Retrieved March 07, 2016, from http://www.kacr.cz/data/Metodika/Auditing/Dokument%20pro%20zprávy%20úč.znalců%20o%20čerpání%20dotací/ICAEW%20Technical%20Release%20AAF%2001%2010_anglický%20originál.pdf.

Badinger, H. (2005). Growth Effects of Economic Integration: Evidence from the Member States. *Review of World Economics / Weltwirtschaftliches Archiv*, *141*(1), 50-78. doi:10.1007/s10290-005-0015-y.

Badinger, H. (2008). Technology- and investment-led growth effects of economic integration: a panel cointegration analysis for EU-15 (1960-2000). *Applied Economics Letters*, *15*(7), 557-561. doi:10.1080/13504850600711669.

Badinger, H., Müller, W., & Tondl, G. (2004). Regional Convergence in the European Union, 1985-1999: A Spatial Dynamic Panel Analysis. *Regional Studies, 38*(3), 241-253. doi:10.1080/0034340042000211105.

Bailey, S. J. (2002). *Public sector economics: Theory, policy and practice* (2nd ed.). Basingstoke: Macmillan.

Boldrin, M., & Canova, F. (2001). Inequality and Convergence in Europe's Regions: Reconsidering European Regional Policies. *Economic Policy, 16*(32), 205-253. doi:10.1111/1468-0327.00074.

Bouvet, F. (2010). EMU and the dynamics of regional per capita income inequality in Europe. *Journal of Economic Inequality, 8*(3), 323-344. doi:10.1007/s10888-010-9129-0.

Czech Republic. (2000). Call. no. 218/2000 on budgetary rules and amending certain related laws dated 27 June 2000. §3 a). Retrieved March 20, 2016, from http://www.bezkorupce.cz/wp-content/uploads/2013/02/218_2000_Sb.pdf.

Czech Statistical Office. (2014). *Businesses in the Central-Bohemia Region in 2014*. Retrieved January 29, 2016, from https://www.czso.cz/csu/xs/ekonomicke-subjekty-ve-stredoceskem-kraji-v-roce-2014.

Czech Statistical Office. (2015). *Public database*. Retrieved December 29, 2015, from https://vdb.czso.cz/vdbvo2/faces/cs/index.jsf?page=home.

CzechInvest. (2015). *OP PI grant statistics*. Retrieved December 29, 2015, from http://eaccount.czechinvest.org/Statistiky/StatistikaCerpaniDotaci.aspx.

Delgado-Rodríguez, M. J., & Álvarez-Ayuso, I. (2008). Economic Growth and Convergence of EU Member States: An Empirical Investigation. *Review of Development Economics, 12*(3), 486-497. doi:10.1111/j.1467-9361.2008.00440.x.

Desli, E. (2009). Convergence and efficiency: Evidence from the EU-15. *Journal of Post Keynesian Economics, 31*(3), 403-430.

El-Agraa, A. M. (2013). *The European Union: Economics and policies* (9th ed.). Cambridge: Cambridge University Press.

European Coal and Steel Community. (1951). Treaty establishing the European Coal and Steel Community. Retrieved December 17, 2015, from http://www.euroskop.cz/gallery/2/753-smlouva_o_esuo.pdf.

European Union. (2012). Consolidated Version of Treaty on the Functioning of European Union. Retrieved October 02, 2015, from http://eur-lex.europa.eu/legal-content/CS/TXT/PDF/?uri=CELEX:12012E/TXT&from=CS.

European Union. (2015). *How is the EU budget used?* Retrieved October 5, 2015, from http://europa.eu/about-eu/basic-information/money/expenditure/index_cs.htm.

Henrekson, M., Torstensson, J., & Torstensson, R. (1997). Growth effects of European integration. *European Economic Review, 41*(8), 1537-1557. doi:10.1016/S0014-2921(97)00063-9.

Hindls, R., & Hronová, S. (2007). *Statistika pro ekonomy*. Prague: Professional Publishing.

Jones, E., Menon, A., & Weatherill, S. (2012). *The Oxford handbook of the European Union*. Oxford: Oxford University Press.

Landau, D. (1995). The contribution of the European Common Market to the growth of its member countries: An empirical test. *Weltwirtschaftliches Archiv, 131*(4), 774-782. doi:10.1007/BF02707941.

Lee, J. (1992). *International Trade, Distortions and Long-Run Economic Growth* [IMF Working Papers, 92(90)]. doi:10.2307/3867316.

Leonardi, R. (2006). Cohesion in the European Union. *Regional Studies, 40*(2), 155-166. doi:10.1080/00343400600600462.

Lucas, R. E. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics, 22*(1), 3-42. doi:10.1016/0304-3932(88)90168-7.

Lucas, R. E. (2009). Ideas and Growth. *Economica, 76*(301), 1-19. doi:10.1111/j.1468-0335.2008.00748.x.

MacDonald, J. M. (1994). Does Import Competition Force Efficient Production? *Review of Economics and Statistics, 76*(4), 721-727. doi:10.2307/2109773.

Macháček, J., Silovská, H., Říhová, G., & Jílek, P. (2013). Regionální mulitplikační efekt jako indikátor lokálního rozvoje. *E&M Ekonomie a Management*, *16(3*), 20-33.

Martinčík, D., & Šlehoferová, M. (2014). Competitiveness and Convergence of Czech Regions: Persistence of Discrepancies. *E&M Ekonomie a Management*, *17*(2), 14-33. doi:10.15240/tul/001/2014-2-002.

Martinčík, D. (2002). Grants in the Theory of the Firm. *E&M Ekonomie a Management*, *5*(4), 21-24.

Maudos, J., Pastor, M. J., & Serrano, L. (1999). Economic Integration, Efficiency and Economic Growth: The European Union Experience. *Applied Economics Letters, 6*(6), 389-392. doi:10.1080/135048599353159.

Ministry of Regional Development of the Czech Republic. (2007). *National Strategic Reference Framework*. Retrieved February 18, 2016, from http://www.strukturalni-fondy.cz/getmedia/c81992d9-a5a7-4382-a859-a7ec13e9d654/Narodni-strategicky-referencni-ramec-CJ-cervenec.

Ministry of Regional Development of the Czech Republic. (2014). *Partnership Agreement for the Programming Period 2014-2020*. Retrieved February 18, 2016, from http://www.strukturalni-fondy.cz/getmedia/6231de90-b818-4bf7-9d07-232e41da9567/Dohoda-o-partnerstvi_schvalena-EK-26-8-2014.pdf?ext=.pdf.

Ministry of Regional Development of the Czech Republic. (2015a). *Strukturální-fondy.cz. Brief overview of the drawing*. Retrieved November 15, 2015, from http://www.strukturalni-fondy.cz/getmedia/9216a6b8-8bdf-402d-9621-035ffe673bec/Strucny-prehled-cerpani_2015_03.pdf?ext=.pdf.

Ministry of Regional Development of the Czech Republic. (2015b). *Programming period 2007-2013*. Retrieved October 30, 2015, from http://www.strukturalni-fondy.cz/cs/Fondy-EU/Programove-obdobi-2007-2013.

Musgrave, R. A. (1959). The Theory of Public Finance. *The Economic Journal*, *69*(276), 766-770.

Nevima, J., & Melecký, L. (2011). Analýza beta-konvergence regionů zemí visegrádské čtyřky prostřednictvím nelineárního regresního modelu. *Acta Academica Karviniensia*, *2011*(3), 43-57.

Pastor, J. M., & Serrano, L. (2012). European Integration and Inequality among Countries: A Lifecycle Income Analysis. *Review of International Economics, 20*(1), 186-199. doi:10.1111/j.1467-9396.2011.00998.x.

Puga, D. (2002). European Regional Policies in the Light of Recent Location Theories. *Journal of Economic Geography 2*(4), 373-406.

Romer, P. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy, 94*(5), 1002-1037.

Rubini, L. (2010). *The Definition of Subsidy and State Aid: WTO and EC in comparative perspective*. Oxford: Oxford University Press.

Sapir, A., Aghion, P., Bertola, G., Hellwig, M., Pisani-Ferry, J., Rosati, D., Vinals, J., & Wallace, J. (2004). *An Agenda for a Growing Europe: The Sapir Report*. Oxford: Oxford University Press.

Šipikal, M., Pisár, P., & Labudová, V. (2013). Are subsidies really needed? The case of EU regional policy in the Czech and Slovak Republic. *E&M Ekonomie a Management*, *16*(4), 30-41.

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, *70*(1), 65-94.

Torstensson, R. M. (1999). Growth, knowledge transfer and European integration. *Applied Economics, 31*(1), 97-106.

World Trade Organization. (2006). *World Trade Report. Defining Subsidies*. Retrieved October 04, 2015, from https://www.wto.org/english/res_e/booksp_e/anrep_e/wtr06-2b_e.pdf.

Ing. Kristýna Brzáková
Technical University of Liberec
Faculty of Economics
Department of Economics
kristyna.brzakova@tul.cz

prof. Ing. Jiří Kraft, CSc.
Technical University of Liberec
Faculty of Economics
Department of Economics
jiri.kraft@tul.cz

Abstract

ECONOMIC CONTEXT OF EUROPEAN SUBSIDIES AND THEIR IMPACT ON REGIONAL ECONOMIC DISPARITIES ON THE EXAMPLE OF THE CZECH REPUBLIC

Kristýna Brzáková, Jiří Kraft

This paper presents the theoretical perspectives of economic trends in view on subsidies to investment and ask whether the allocated subsidy of ESI, specifically in the Czech Republic, are substantiated in these economic theories. This article aims to show the relationship between the amounts drawn from the selected operational program of ESI funds and per capita income level in various regions NUTS 3 during 2007-2015 in the Czech Republic. For the purpose of achieving the set goals time series analysis of variables and correlation analysis using Pearson correlation coefficient have been used. Time series data has been controlled by Durbin-Watson test of autocorrelation.

Results of theoretical research brought a positive response that subsidies should positively affect the economic level of the population and should help lagging EU Member States and regions within those Member States in their economic growth. The results of empirical research showed that the correlation relationship of the amount of EU subsidies paid to the regions in the Czech Republic and the level of income cannot be clearly demonstrated. Significant correlation has been found in few of regions. However, in most cases dependence has not been demonstrated, thus, correlation between income level and amount of ESI funds from EU is not submitted. It can be concluded that in the short term, the level of per capita income in the region is getting closer to the most developed region of the City of Prague and therefore lagging regions of the country get economically closer. However, this fact cannot be clearly attributed to the amounts allocated through ESI subsidies in various regions of the Czech Republic.

Key Words: *EU funds, subsidy, European convergence, regional disparities, European Union.*

JEL Classification: *H25, R11, J31.*

DOI: *10.15240/tul/001/2017-2-005*