



**How does Institutional Setting Affect the Impact  
of EU Structural Funds on Economic Cohesion?  
New Evidence from Central and Eastern Europe**

*Marina Gruševaja  
Toralf Pusch*

October 2011

No. 17

Authors: *Dr Marina Gruševaja*  
Halle Institute for Economic Research  
Department: Research Affairs  
E-mail: Marina.Grusevaja@iwh-halle.de  
Phone: +49 (0) 345 7753-727

*Dr Toralf Pusch*  
Halle Institute for Economic Research  
Department: Research Affairs  
E-mail: Toralf.Pusch@iwh-halle.de  
Phone: +49 (0) 345 7753-807

The responsibility for discussion papers lies solely with the individual authors. The views expressed herein do not necessarily represent those of the IWH. The papers represent preliminary work and are circulated to encourage discussion with the authors. Citation of the discussion papers should account for their provisional character; a revised version may be available directly from the authors.

Comments and suggestions on the methods and results presented are welcome.

IWH Discussion Papers are indexed in RePEc-Econpapers and in ECONIS.

Editor:  
HALLE INSTITUTE FOR ECONOMIC RESEARCH – IWH  
Prof Dr Dr h. c. Ulrich Blum (President), Dr Hubert Gabrisch (Research Director)  
The IWH is a member of the Leibniz Association.

Address: Kleine Maerkerstrasse 8, D-06108 Halle (Saale), Germany  
Postal Address: P.O. Box 11 03 61, D-06017 Halle (Saale), Germany  
Phone: +49 (0) 345 7753-60  
Fax: +49 (0) 345 7753-820  
Internet: <http://www.iwh-halle.de>

# **How does Institutional Setting Affect the Impact of EU Structural Funds on Economic Cohesion? New Evidence from Central and Eastern Europe**

## **Abstract**

Structural Funds are the main instrument of the EU cohesion policy. Their effective use is subject to an ongoing debate in political and scientific circles. European fiscal assistance under this heading should promote economic and social cohesion in the member states of the European Union. Recently, the domestic institutional capacity to absorb, to distribute and to invest Structural Funds effectively has become a crucial determinant of the cohesion process and has attracted attention of the scientific community. The aim of this study is to shed light on the effectiveness of Structural Funds in the countries of the first Central and Eastern European enlargement round in 2004. Using regional data for these countries, we have a look on the impact of several institutional governance variables on the effectiveness of Structural Funds. In the interpretation of results, reference is made to regional economics. Results of the empirical analysis indicate an influence of certain institutional variables on the effectiveness of Structural Funds in the new member states.

**Keywords:** EU cohesion policy, Structural Funds, institutional setting, EU new member states

**JEL Classification:** R11, P2, O38

# **Wie beeinflusst das institutionelle Umfeld die Effektivität der EU-Strukturfonds im Hinblick auf die wirtschaftliche Kohäsion? Neue Ergebnisse für Mittel- und Osteuropa**

## **Zusammenfassung**

Europäische Strukturfonds sind das wichtigste Instrument der EU-Kohäsionspolitik. Ihre effektive Nutzung wird seit längerem in den politischen und wissenschaftlichen Kreisen diskutiert. Die europäischen Strukturfonds sind auf die wirtschaftliche und soziale Kohäsion ausgerichtet. Sie sollen dazu beitragen, wirtschaftliche und soziale Probleme zu lösen und die wirtschaftliche Entwicklung in den Mitgliedstaaten der Europäischen Union (EU) zu fördern. Insbesondere die inländischen institutionellen Kapazitäten, die europäischen Finanztransfers zu absorbieren, zu verbreiten und effektiv zu investieren, werden zunehmend zu einem entscheidenden Faktor für effektive Kohäsionsprozesse, was wir in unserem Beitrag auf den Prüfstand stellen. Ziel ist dabei, die Effektivität der Strukturfonds in den Ländern der ersten EU-Erweiterung um mittel- und osteuropäische Länder im Jahr 2004 zu analysieren. Anhand dieser Länder werden die Effekte verschiedener institutioneller Variablen auf die Wirksamkeit der Strukturfonds auf regionaler Ebene untersucht. In der Interpretation unserer Ergebnisse beziehen wir uns zusätzlich auf die Regionalökonomie. Das Ergebnis der empirischen Analyse zeigt den Einfluss bestimmter institutioneller Variablen auf die Effektivität der Strukturfonds in den neuen Mitgliedstaaten der EU.

Schlagwörter: EU-Kohäsionspolitik, Strukturfonds, Institutionen,  
Neue EU-Mitgliedsländer

JEL-Klassifikation: R11, P2, O38

## 1. Introduction

Structural Funds are the main instrument of the EU Cohesion Policy. They should serve to achieve economic and social cohesion by reducing differences in economic development between the EU regions. Member States of the European Union (EU) receive assistance from the EU Structural Funds to tackle structural economic and social problems and to promote development. Several funds are used to this end among which the European Regional Development Fund (ERDF) is the largest. This fund was introduced in 1975. Since then economic and social cohesion are overarching objectives of the European Community, although the regulations and the scope of EU Cohesion Policy have undergone many changes.

Recent developments of the European Cohesion Policy enshrined in the Lisbon Treaty, with the focus on growth, competitiveness and three dimensions of cohesion – economic, social and territorial cohesion –, are directed towards strengthening of EU's global economic and political role. The distinctive European Model of Society should be based on solidarity and co-operative governance. New strategic documents included within "Europe 2020" as the framework for Cohesion Policy in the post-2013 period outline the challenges facing the European Union as a whole and its individual Member States. The high relevance of the European Cohesion Policy is evident in this context as Structural Funds absorb approximately 1/3 of EU budget. Hence, the EU's fiscal transfers require public legitimation. Recently the spending under the auspices of the Structural Funds Programs is subject to ex-post evaluations and political discussions for the new funding period 2014-2020.

Despite the ongoing debate on the new policy implications the main principles of the EU Cohesion Policy, however, remained unchanged. First, the largest part of the overall Structural Funds budget goes to regions with Convergence Objective (formerly Objective 1) status. 2/3 of the total budget is distributed among regions with GDP per capita less than 75% of the EU average to foster growth of per-capita-GDP and to promote aggregate growth in the EU (Becker, Egger, and Ehrlich 2010). Second, to receive support from the EU the member state are obligated to co-finance regional projects and payments are granted on specific conditions. This implies that the domestic institutional capacity to absorb, to distribute and to invest EU grants effectively has become a crucial determinant of cohesion process and has attracted attention of the scientific community.

The recent literature focuses on the evaluation of the effectiveness of Structural Funds in achieving cohesion between the member states or the regions. In general, Structural Funds expenditures are assumed to be effective if they promote growth and foster a trend to convergence across regions or countries. Empirical evidence for convergence between European nations or regions as well as the evidence for the effectiveness of Structural Funds in the literature is however mixed. Some recent studies find neither convergence of regional per capita income (Boldrin and Canova (2001) for 185 NUTS2

regions in the period 1980-1996) nor signs of increasing growth rates in the most disadvantaged regions. Thus, they reject beneficial effects of Structural Funds. Other studies observe convergence on the national level and a positive relationship between Structural Funds and GDP growth (Beugelsdijk and Eijfinger (2005) for 15 EU member states in the period from 1995-2001).

These obviously contrary observations directed attention to the country-specific environment and especially to institutional factors that probably influence the effectiveness of Structural Funds. Hence, in some recent studies next to 'traditional' economic variables also measures for institutional quality were considered; such as corruption, efficiency of bureaucracy, competitiveness of political participation, political and administrative decentralization. Furthermore, variables like the degree of trade openness, inflation, macroeconomic stability were introduced as proxies of institutional quality. Since then, the impact of the EU Structural Funds on the growth rate (and related variables) of 15 EU member states and the interaction terms with institutional variables became significant (Katsaitis and Doulos 2009, Ederveen et al. 2002; Ederveen, de Groot, and Nahuis 2006).

However, the positive effect of high institutional quality does not automatically implicate that cross-territorial differences in economic and social development are reduced as aimed by the EU Cohesion Policy. It is still questionable whether the EU's fiscal equalization transfers are investment stimulating and foster the convergence process. A number of recent studies have shown that the effectiveness evaluation is ambiguous for the following reasons. First, the requirement of co-funding ensures, on the one hand, that resources are invested. On the other hand, they may cause crowding out of national funds from otherwise implemented projects (Bähr 2008) and attract human capital from other more productive activities. Second, the institutional setup such as impact of decentralization is playing a crucial role. It could be expected that regional authorities have better information on specific growth enhancing projects. At the same time, a higher degree of centralization inhibits a greater administrative capacity that ensures a more effective regional implementation of the programs (Ezcurra and Rodriguez-Pose 2011). In addition, Ederveen et al. (2006) point out another possible negative impact on growth of the decentralized decision making. Structural Funds payments may provide profitable options for rent seeking by public officials on national and regional level. Those administrative bodies are involved in partnership-based decision-making process to specify the National Strategic Programs, to define the specific project priorities and are particularly concerned with implementation of operational programs (Katsaitis and Doulos 2009). These activities allow public officials to channel financial transfers in such a way to pursue their own strategies and interests.

To summarize, the impact of "non-traditional" institutional variables on effectiveness of the EU Structural Funds is not to be neglected and therefore needs to be examined in more detail; even that is difficult if not impossible. In this paper, we use a unique set of "non-traditional" institutional variables and try to establish further evidence for the con-

nection between the institutional quality and the effectiveness of the Structural Funds in terms of convergence and cohesion. Earlier works evaluated EU Structural and Cohesion policies for the old EU member states, implying the availability of sufficient data as regards the number of regions as well as the time dimension. Different from the studies mentioned before, we focus on the countries of Central and Eastern Europe. Since (but also before) these countries joined the European Union in 2004 they became eligible for transfer payments as poor regions regarding the EU average of GDP per capita. Lagging behind the EU 15 average in term of per capita income these countries are expected to have a high benefit from fiscal transfers and converge towards “rich” countries. Hence, the national institutional settings possibly support or reduce this positive net effect on GDP per capita.

The paper is structured as follows. Section 2 gives a short overview of the theoretical framework for the EU Cohesion Policy and offers a literature-based review on the existing studies. It considers the methodological approaches and discusses how these can be used in our study. Section 3 presents our empirical study design and is followed by section 4 with the econometric investigation. Section 5 concludes with a brief interpretation of results and some implications for policy.

## **2. Theoretical Framework for Evaluation of the EU Cohesion Policy**

Empirical evaluation studies of the EU Cohesion Policy are mainly based on neoclassical growth theory and trade theories and their reasoning is still dominated by the so-called “convergence hypothesis”. This hypothesis implicates that under certain conditions countries and regions converge in terms of income level and productivity. However, the necessity and the impact of Cohesion Policy interventions are considered as ambiguous. The theoretical approaches could be differentiated between “new” and “traditional” concepts with different political implications (Heinemann et al. 2010, p. 28-36; Hagen and Mohl 2009, p. 6-12; Monastiriotis 2011). New (endogenous) growth theory (Romer 1986, 1990) implies that long-term positive effects are possible if the regional political interventions promote R&D, human, social and public capital. New economic geography indicates similar positive effects (Krugman 1991) under condition of a dynamic interplay between agglomeration and dispersion forces. Traditional neoclassical growth theory (Solow 1956) neglects long-term effects of regional policy. According to the Solow one-sector growth model - under assumption of common technology and diminishing returns - countries with similar economic conditions converge to the same balanced growth path (income level) if they have access to technological know-how.

The recent evaluation of EU Cohesion Policy in econometric studies is focused on testing the convergence hypothesis. However, there are different concepts of convergence. The so-called  $\beta$ -convergence implies that less developed countries grow faster

than richer countries in terms of income level (measured in GDP pro capita, Durlauf, Johnson and Temple 2005, p. 585). If the relationship between income growth and the initial income level is inverse without controlling for other variables,  $\beta$ -convergence is unconditional or absolute. Conditional convergence assumes the same relationship after conditioning of further variables. Thus, the neoclassical growth model expects negative  $\beta$ . Both hypotheses are approved by empirical studies (Hagen and Mohl 2009, p. 8; Heinemann et al. 2010, p. 32). Hence, the  $\beta$ -convergence concept - with its linear regression context of the neoclassical growth model - is widely used for econometric evaluations of cohesion policy. The second convergence concept –  $\sigma$ -convergence - measures the diminishing of income dispersion over time (Barro and Sala-i-Martin 1991, 1992). Both concepts are linked whereas  $\sigma$ -convergence presumes the evidence of  $\beta$ -convergence but not the other way round. In other words, the income levels can disperse between regions (e.g. no  $\sigma$ -convergence) while less developed regions still grow faster than developed ones (e.g.  $\beta$ -convergence). Independent from the concept of convergence applied the impact of EU Structural Funds on regional development and growth within CEE countries might be different from that in the 15 EU member states.<sup>1</sup> As all EU new member states had similarly low levels of per capita initial income before the EU accession, higher growth rates and faster convergence processes can be expected. That makes them an interesting subject for a separate evaluation.

In our econometric study we refer to a range of empirical studies that have been conducted in order to evaluate the effects of EU Structural Funds. As an example for a recent literature review, Heinemann et al. (2010, p. 89) give an overview of 15 studies. The majority of these studies is looking for effects on the level of NUTS2 and NUTS1 regions. Results are diverse, as the studies are based on different methods, data sources and research questions. Some of the recent studies find neither convergence of regional per capita incomes (Boldrin and Canova (2001) for 185 NUTS2 regions in the period 1980-1996) nor signs of increasing growth rates in the most disadvantaged regions. Thus, they reject beneficial effects of Structural Funds. Other studies observe  $\beta$ -convergence among 15 EU member states and a positive relationship between Structural Funds and GDP growth on the national level (Beugelsdijk and Eijffinger 2005).

The usual setup of these studies is described by Beugelsdijk and Eijffinger (2005). It is based on neoclassical growth theory and empirical tests are then specified using the concept of  $\beta$ -convergence. In most cases the variables considered comprise the initial (per capita) level of GDP, population (growth), human capital (growth), investment or savings quota. We include this data selection also in our study as far as data is available

---

<sup>1</sup> Beside  $\beta$ - and  $\sigma$ -convergence recently some scholars have found evidence in favor of club convergence for within-country clubs (Fischer and Stirböck 2006) and for cross-country clubs (Artelaris et al. 2010). Accordingly to this concept smaller and less developed countries and regions converge to a different steady-state than larger and advanced ones. The later follow a more dynamic path of growth as economic preconditions – initial level of income, productivity, institutional capacities – are different. The pattern of divergence has also been empirically confirmed for CEECs since the collapse of centrally planned system (Monastitiotis 2011, p. 6-8).



and relevant. By this means, a growth equation can be set up and the next step is to test effects of cohesion policy. Most studies so far apply panel estimations but there are also some cross-section OLS studies. Effects comprise the speed of income convergence (the majority of studies) or other variables like FDI (Katsaitis and Doulos 2009). More specifically, a number of theoretical arguments can be tested like the effectiveness of Structural Funds conditional on the level of income convergence (Eggert et al. 2007), the geographic location (de Freitas et al. 2003) and others.

As mentioned above, the findings of empirical studies are diverse. These different observations directed the attention to the country-specific environment and especially to institutional factors that possibly influence the effectiveness of Structural Funds. Using country-level data some recent studies investigate whether the impact of Structural Funds payments depends on institutional settings of the country (Ederveen et al 2006; Bähr 2008). In addition to “traditional” economic variables the measures and proxies for institutional quality are introduced, such as corruption indices, efficiency of bureaucracy, competitiveness of political participation, political and administrative decentralization, degree of trade openness, inflation, and macroeconomic stability.

An important result of a number of empirical studies is that the impact of Structural Funds on growth and the interaction terms with institutional variables show significant values. For instance, Ederveen et al. (2006) find evidence for effects of corruption, a good governance index (with the World Bank governance indicators “political stability”, “government effectiveness” and “rule of law” defined by Jeffrey Sachs) and other proxies for the institutional setting on the growth enhancing effect of Structural Funds. In a similar study, Bähr (2008) could find evidence for a conditioning effect of tax autonomy in this context. Katsaitis and Doulos (2009) tested a measure for corruption and the Sachs index in their study about the effects of Structural Funds on FDI. They could find a conditioning effect of institutional variables on FDI. According to them, more corrupt countries especially in Southern Europe are prone to ineffective use of Structural Funds. This result is however not uncontested. For example, Beugelsdijk and Eijffinger (2005) could not find it between different country groupings with respect to growth.

Our study relates to this recent strand of literature using similar model specifications. In contrast to many earlier studies we use regional data for our analysis instead of country level data. We justify our choice with the original focus of the EU Cohesion Policy on development and convergence of regions. Besides, we seek to increase the robustness of results by including a higher number of cross sections.

### 3. Empirical analysis

As mentioned above, our own empirical analysis is restricted to CEE countries, as effects of Structural Funds on economic cohesion in the post-transition area of the EU are under-researched, so far. The aim of our study is threefold. Our first aim is to shed light on the effectiveness of Structural Funds in the countries of the first CEEC enlargement round in 2004. To our best knowledge, the effectiveness of Cohesion Policy in this area was not yet tested, so far. Second, we have a look on the impact of several institutional governance variables like a corruption index and the accordance of NUTS2 regions with regional administration units (Heimpold 2008) on the effectiveness of Structural Funds at the regional level (NUTS2 regions). To this end, we estimate a specification where we let the institutional variable and Structural Funds interact to find evidence whether there is a conditional impact of Structural Funds received on regional disparities in the CEECs. Third, in the interpretation of our results we also make reference to regional economics. As an example, Heimpold (2008) has studied national strategic documents and found some evidence for differences in the conduct of EU Cohesion Policy in CEECs with respect to the strategy of regional policy (equalization objective versus growth-orientation objective). If this is confirmed in our additional calculation of correlations, it is interesting for the judgment of Structural Funds in the context of the targets of EU Cohesion Policy.

As a measure of Structural Funds we used financial flows under the ERDF headline of Objective 1 which are supplied by the DG Regio of the European Commission. There were 39 NUTS2 regions in the CEECs which received Objective 1 funding during the 2000-2006 program period. Furthermore, we collected economic control variables which are usual in our context of growth regressions and which are supplied by Eurostat at the NUTS2 level. We followed the specification and data transformation strategy of Ederveen et al. (2006) who have applied a neoclassical growth theory model of Mankiw et al. (1992). Our time frame covers the 2000-2006 program period, starting in 1999 and ending in 2007 just before the onset of the global financial crisis. This period was then divided in two sub-periods of equal length (4 years each: 1999-2003; 2003-2007) which together approximately cover one business cycle (peaks were in 2000 and 2008). This step is justified by the consideration that a longer stretch of two periods takes a better account of income level versus growth effects. Besides, most studies mentioned in section 2 are based on periods of similar length (usually 5 year spans are used).

Our measure for initial GDP is the log of GDP per capita in 1999 (and 2003 for the second sub-period) given as purchasing power standard figure. The dependent variable is the difference of this variable measured at the end and the beginning of the sub-period. This seems reasonable as investments induced by Structural Funds can be expected to need some time to unfold its productive potential. The other control variables are chosen similarly as in the Ederveen et al. (2006) study. We used the log of investment share and population growth (augmented by an assumed depreciation parameter of 0.05) over the

sub-periods, a human capital variable<sup>2</sup> and the flow of Structural Funds. The basic regression equation takes the following form:

$$g_t = c + Y_{t-1} + I_t + HC_t + n_t + SF_t + SF_t * Inst_t + Inst_t$$

The variables are defined as follows:  $g_t$  as growth of per capita income in period  $t$ ,  $Y_{t-1}$  as log of per capita income of the subsequent period,  $I_t$  as log of the investment rate,  $HC_t$  as growth of human capital,  $n_t$  as log of the sum of population growth and the assumed depreciation rate of 0.05,  $SF_t$  as flow of Structural Funds (calculated as a share of regional GDP in the sub-period) and  $Inst_t$  as the respective institutional variable. The institutional variables were further normalized to 0 in the first sub-period as they were only introduced to control for a conditioning effect on the impact of Structural Funds in the second sub-period and their joint influence should therefore be restricted to this period only.

Our selection of institutional variables comprised the corruption perception index (CPI) of Transparency International which was already used in earlier studies (Ederveen et al. 2006, Eijffinger 2005). This variable was calculated as an average CPI figure of the years 2003-2006. Moreover, we constructed two institutional variables which were inspired by Heimpold's (2008) work about the conduct of Cohesion Policy in Poland, Hungary and the Czech Republic. The first variable REG has value 1 in the case of accordance of a NUTS2 region with a regional administration unit in the CEECs. This is not always the case as in some cases the regional administration units (counties) of new member states were too small by EU standards and it was required by the EU to set up new NUTS2 administration units which are just responsible for the management of Structural Funds. In these cases the variable REG assumes value 0. Furthermore, Heimpold (2008) has studied strategic documents which are relevant for the conduct of the EU Cohesion Policy in some CEECs, i.e. Czech Republic, Poland and Hungary. For the Czech Republic and Hungary he could find a stronger equalization objective (thus favouring regions with a laggard income position) while for Poland the picture was more in favour of the growth objective (favouring regions with a higher potential for growth). Such national strategies might be relevant for the effects of Structural Funds in the larger CEECs – Czech Republic, Hungary, Poland and Slovakia – which are comprised of a number of NUTS2 regions. In order to test if the strategies indeed played a role in each of these countries we conducted a correlation analysis of the initial regional per capita income positions and the per capita use of Structural Funds (the same variables were used in the regressions). Results are shown in Table 1.

---

<sup>2</sup> Eurostat HRSTC data, change of employees (as a share in total employment) with an education in science and technology which are actually employed in that field.

Table 1:

Correlations for the use of Structural Funds and regional income, \*\*\*/\*\*\*: correlations significant at the 10/5/1% level

	Correlations	n
CZ	-0.97***	8
CZ without Prague	-0.67*	7
HU	-0.85**	7
HU without Budapest	-0.86**	6
PL	-0.37	16
PL without Warsaw	-0.26	15
SK	-0.85	4
SK without Bratislava	-0.45	3

What can be seen from Table 1 is that the equalization objective indeed played a role in the Czech Republic and Hungary even if their capital regions are removed from the sample. For Poland we can confirm Heimpold's (2008) finding that the equalization objective is not dominant. The same holds for Slovakia with the reservation that there are only 3 observations without the capital region. Thus, we coded our equalization variable as 1 for the Czech Republic and Hungary and 0 for Poland and Slovakia. The countries with only one NUTS2 region were also coded as 0 because there was no scope for an equalization strategy relying on more than 1 region.

Subsequently we performed panel regressions with our data set. The baseline estimation included our economic controls, however not the institutional terms of eq. (1).<sup>3</sup> As the time dimension of our panel consisted of only two periods, no fixed effects or random effects could be applied. Therefore, a careful look on possible outliers and data anomalies was especially important. Anomalies were detected using Students t influence statistics and included the capital regions of Czech Republic, Hungary and Slovakia. That is however not surprising as these capitals are non-representative for their countries which display a mono-centric settlement structure (Heimpold 2008). Moreover, Lithuania showed an extraordinary high growth in the first sub-period (resulting in skewness of residuals) and was therefore removed from the sample. Finally, the Hungarian regions displayed sluggish growth in the second sub-period. This effect was captured by a country dummy for Hungary and this period. Estimation results for this basic specification are shown in the first column of Table 2.<sup>4</sup> The basic regression of Table 2 (1<sup>st</sup> column) has a good fit and its results are in line with the basic hypothesis of neoclassical growth models (see Mankiw et al. 1992).

<sup>3</sup> Before starting our regressions we also checked if the use of Structural Funds was targeted to regions in severe economic difficulties in the countries considered. If this was the case, estimation results could display biased effects of Structural Funds (see Rodrik's (2005) critique of policy evaluations which do not take into consideration possible policy endogeneity). Correlation coefficients between the Structural Funds flows (second sub-period) and the GDP growth (first sub-period) however proved to be small and insignificant.

<sup>4</sup> The underlying sample of 71 observations was used for the other regressions of Table 2 as well.

Table 2:

Basic regression and conditional impact of institutions on the income effect of Structural Funds, \*/\*\*/\*\*\*: correlations significant at the 10/5/1% level, (Standard errors in parenthesis)

	Basic regression	Institutional conditioning variables		
		Corruption index (CPI)	Regional administration	Equalization policy
Log of initial GDP	-0.09*** (0.03)	-0.06* (0.03)	-0.09*** (0.03)	-0.08** (0.03)
Log of investment rate	0.17*** (0.04)	0.10** (0.05)	0.19*** (0.04)	0.17*** (0.03)
Change of human capital	0.09*** (0.02)	0.18*** (0.04)	0.09*** (0.02)	0.11*** (0.02)
Log of (pop. growth+0.05)	-0.06*** (0.02)	-0.06** (0.03)	-0.07*** (0.02)	-0.07*** (0.02)
Structural funds	-4.59 (3.87)	-46.83** (19.74)	-9.03 (6.42)	-7.42* (4.18)
Structural funds * institutional variable		10.58** (4.91)	3.76 (7.31)	-3.88 (9.33)
institutional variable		-0.04** (0.02)	0.02 (0.04)	-0.05 (0.04)
Dummy for Hungary (2 <sup>nd</sup> period)	-0.21*** (0.02)	-0.22*** (0.03)	-0.18*** (0.03)	-0.15*** (0.03)
C	1.27*** (0.36)	1.06*** (0.35)	1.36*** (0.36)	1.19*** (0.34)
Adjusted R-squared	0.67	0.70	0.68	0.70
Jarque-Bera p value	0.43	0.26	0.32	0.45
# of observations	71	71	71	71

Three additional regressions which control for the conditioning impact of institutions on the income/growth effects of Structural Funds are documented to the right. Generally, the results of these regressions are comparable for the basic set of economic controls. The goodness of fit is slightly better for the regressions with institutional variables. Furthermore, only the interaction term of Structural Funds with the Corruption Perception Index shows a significant value, indicating that low corruption (high value of CPI) leads to higher growth/income effects of Structural Funds flows in the regions. The regional administration variable does however not contribute to larger effects of Structural Funds, as the insignificant interaction term suggests. Thus, our result suggest that Structural Funds have a similar impact regardless if their administration is conducted by an artificial layer imposed by the necessities of EU membership or not. The same also holds for the conditioning effect of an equalization strategy at the national level. We must however be careful in not misinterpreting this result as it does not mean that a national equalization strategy does not matter for the regional growth/income development

and the contribution of Structural Funds in this context. If there is a net effect of Structural Funds on regional growth/income, it might be that an equalization strategy impacts on regional development as it effects the distribution of Structural Funds among regions and thus the net growth effect which they experience. The conditioning effect of a low corruption record in our regressions suggests that there are such net effects of Structural Funds in the CEECs. Thus, our result for the equalization variable only indicates that there are no additional effects (positive or negative) for the working of Structural Funds which are implied by an equalisation strategy. This is an interesting result on its own because in the economic policy discussion equalization strategies are nowadays often seen as obstacles to growth – which we could not find in our study.

#### **4. Conclusions and remarks for future research**

This study aims to add new insights to the evaluation of the EU Cohesion Policy and factors of its effectiveness in the last funding period 2000-2006. Its focus is on new EU member states of the 2004 enlargement round which are part of the CEE region. These countries had a per capita GDP lower than 75% of the EU' average and, thus, their regions qualified for Objective 1 transfers after accession to the EU. The analysis sheds light primarily on the impact of institutional variables on the effectiveness of the EU Structural Funds under the Objective 1 heading using regional level data (of NUTS2 regions).

Our results can be summarized as follows. First, we provide estimates for drivers of per-capita GDP growth over two sub-periods in 10 countries of CEE. In additional regressions we tested the additional effect of Objective 1 Structural Funds in the context of this growth regression. Second, three institutional variables – Corruption Perception Index, a regional NUTS2 administration variable and an equalization/growth objective policy variable – were inserted into the regression together with Structural Funds. Of these institutional variables only the Corruption Perception Index signalled to have a conditioning effect on the impact of Structural Funds as the significant interaction term with Structural Funds indicated. This result corresponds with the intuitive assumption that a lower corruption leads to higher growth/income effect of publicly administered funds. Third, the two other constructed institutional variables that were inspired by Heimpold's (2008) work showed no significant value. This is an interesting finding in itself as these variables refer to the influence of national strategies on the conduct of the EU Cohesion Policy.

If some tentative conclusions from our empirical findings can be drawn, these might be especially relevant for the countries following an equalisation strategy in their regional policy. Our results could be interpreted in such manner that equalization strategy is not counteracted by a low effectiveness of the EU Structural Funds transfers in promoting growth to the regions. Furthermore, our results indicate that a contribution of the EU Structural Funds to cohesion is not affected by the accordance of NUTS2 regions with

regional administration units. Thus, the division in NUTS2 regions does not reveal particular rent seeking activities and/or reduced administrative capacities caused by conflicts between regional administrations within one NUTS2 region. However, this might be also an aspect for further research considering the channels through which the EU Cohesion policy and national structural policy work.

Nevertheless, empirical findings from regression analysis have generally to be interpreted with caution. For example Rodrik (2005) as well as Hagen and Mohl (2009) have raised the question of possible endogeneity of policy measures. This issue seems to have been neglected in most of the empirical studies. Moreover, Hagen and Mohl (2009) have pointed to the distinctive results of studies based on national data as opposed to regional data. Spatial spillover effects can raise the problem of an omitted variable bias. One might expect an underestimation of the effects on the regional level as parts of possible beneficial effects of investment induced by Structural Funds could be realized in other regions. This, however, contrasts with findings that Structural Funds seem to show more visible effects on the regional level than on the national level (possibly also due to different tested convergence concepts, see Heinemann et al. 2010, p. 95). Other variables like political-economic factors which are neglected in some of the empirical studies have been partly incorporated in our study as institutional variables (corruption, regional administration capacity, national strategies).

Finally, we would like to mention some open questions for future research. First, we used for our analysis the framework of neoclassical growth theory with convergence hypothesis and aggregate data. Hence, our empirical results are in line with recent studies using the same method. However, it would be a challenging task to approach the evaluation of the EU Cohesion Policy with different theoretical and methodological tools. As example, instead of the concept  $\beta$ -convergence the effectiveness of EU's fiscal transfers might be tested with the hypothesis of club convergence (Artelaris, Kallioras and Petrakos 2010). This would allow including the EU's old and new member states into analysis to identify different convergence clubs within EU and its probable effects on the Structural Funds spending. Further, a more detailed analysis of economic outcomes caused by EU's financial assistance would require firm level data to identify the direct and causal effects. It would probably permit to examine the real net effect of EU Structural transfers on growth. Our recent analysis with highly aggregated data does not permit to distinguish between income level and growth effects clearly. Second, we focus on evaluation of the sign of the coefficient of Structural Funds but not of the size of its impact. Hagen and Mohl (2009) pointed at this question for the reason that "an expensive EU regional policy with a tiny size effect might be effective but not "cost-efficient" (Hagen and Mohl 2009, p. 9-10). Hence, the task to explore efficiency of EU Structural Funds in the new member states is important for a comprehensive evaluation of the EU Cohesion Policy. At the same time this is a challenging research question because of hardly precise measureable political-economic factors that determine allocation of funds.

## References

- Artelaris, P., D. Kallioras and G. Petrakos* (2010): Regional inequalities and convergence clubs in the EU New Member States, *Eastern Journal of European Studies*, Vol. 1, 113-133.
- Bähr, C.* (2008): How does Sub-National Autonomy Affect the Effectiveness of Structural Funds? *Kyklos*, Vol. 61, 3-18.
- Barro, R. and X. Sala-i-Martin* (1992): Convergence, *Journal of Political Economy*, Vol. 100, 223-251.
- Barro, R. and X. Sala-i-Martin* (1991): Convergence across states and regions, *Brookings Papers on Economic Activity*, Vol. 1, 107-182.
- Becker, S. O., P. H. Egger and M. v. Ehrlich* (2010): Going NUTS: The effect of EU Structural Funds on regional performance
- Beugelsdijk, M., and S. C. W. Eijffinger* (2005): The Effectiveness of Structural Policy in the European Union: An Empirical Analysis for the EU-15 in 1995-2001, *Journal of Common market Studies*, Vol. 43, 37-51.
- Boldrin, M. and F. Canova* (2001): Inequality and Convergence in Europe's Regions: Reconsidering European Regional Policies, *Economic Policy*, Vol. 32, 205-245.
- De Freitas, M. L., F. Pereira and F. Torres* (2003): Convergence among EU regions, 1990-2001 Quality of national institutions and "Objective 1" status, *Intereconomics*, Vol. 38, 270-275.
- Durlauf, S., P. Johnson and J. Temple* (2005): Growth econometrics, in: *Handbook of Economic Growth*, ed. by P. Aghion and S. Durlauf, Elsevier, Vol. 1 A, 555-677.
- Ederveen, S., J. Gorter, R. de Mooij and R. Nahuis* (2002): Funds and Games. The Economics of European Cohesion Policy, CPB Special Publication No. 41.
- Ederveen, S., H.L.F. de Groot and R. Nahuis* (2006): Fertile Soil for Structural Funds? A Panel Data Analysis of the Conditional Effectiveness of European Cohesion Policy, *Kyklos*, Vol. 59, 17-42.
- Eggert, W., M. von Ehrlich, R. Fenge and G. König* (2007): Konvergenz- und Wachstumseffekte der europäischen Regionalpolitik in Deutschland, *Perspektiven der Wirtschaftspolitik* 2007, Vol. 8, 130-146.
- EU Commission* (2010): Europe 2020 – A Strategy for smart, sustainable and inclusive growth, Brussels, 3.3.2010, COM(2010) 2020.
- Ezcurra, R. and A. Rodríguez-Pose* (2011): Can the economic impact of political decentralisation be measured? CEPR Discussion Paper No. 8211.



- 
- Fischer, M. and C. Stirböck* (2006): Pan-European Regional Income Growth and Club Convergence: Insights from a Spatial Econometric Perspective, *Annals of Regional Science*, Vol. 40, 693-721.
- Hagen, T. and T. Mohl* (2009): Econometric Evaluation of EU Cohesion Policy – A Survey, ZEW Discussion Paper No. 52.
- Heimpold, G.* (2008): Growth versus Equalisation? An Examination of Strategies for Regional Policy in the Czech Republic, Hungary and Poland after EU Accession, *Jahrbuch für Regionalwissenschaft*, Vol. 28, 1-29.
- Heinemann, F., T. Hagen, P. Mohl, S. Osterloh and M. O. Sellenthin* (2010): Die Zukunft der EU-Strukturpolitik, ZEW-Wirtschaftsanalysen, Band 94.
- Katsaitis, O. and D. Doulos* (2009): The Impact of EU Structural Funds on FDI, *Kyklos*, Vol. 62, 563-578.
- Krugman, P.* (1991): Increasing returns and economic geography, *Journal of Political Economy*, Vol. 99, 483-499.
- Monastiriotis, V.* (2011): Regional Growth Dynamics in Central and Eastern Europe, LSE Discussion Paper No. 33.
- Rodrik, D.* (2005): Why we learn Nothing from Regressing Economic Growth on Policies, Discussion Paper, Harvard University (<http://www.hks.harvard.edu/fs/drodrik/Research%20papers/policy%20regressions.pdf>, download on 11.05.2011).
- Romer, P.* (1990): Endogenous technological change, *Journal of Political Economy*, Vol. 95, 86-136.
- Romer, P.* (1986): Increasing returns and long run growth, *Journal of Political Economy*, Vol. 98, 71-102.
- Solow, R.* (1956): A contribution to the theory of economic growth, *Quarterly Journal of Economics*, Vol. 70, 65-94.