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POLICY CHANGE, GROWTH AND CONVERGENCE PROCESSES

The experience of the CEE-10 countries during EU accession negotiations

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I hereby declare that this work contains no materials accepted for any other degrees in any other institutions. This thesis contains no materials previously written and/or published by another person, unless otherwise noted.

Abstract

This dissertation is an empirical investigation of the relationship between macro-economic and institutional policy reforms and the growth performance of the ten Central and Eastern European (CEE-10) countries that acceded to the European Union in the years 2004 and 2007, respectively. Starting from the assumption that the examination of what drove and hindered growth in the CEE-10 countries during accession negotiations can provide indications on how stable growth performance in these newly acceded states is, the dissertation seeks to reveal whether growth rates in the CEE-10 countries have led to income convergence within the region of the CEE-10 at national, NUTS-2 and NUTS-3 levels.

Using both qualitative and quantitative methods of analysis, the dissertation wishes to provide fresh insights into how the implementation of macro-economic policy reforms in the CEE-10 countries influenced growth performance, how the implementation of regional policy affects the spatial distribution of growth, and the extent to which growth rates in the CEE-10 countries lead to income convergence in the region.

Evidence has been found that the larger the extent of macro-economic and institutional policy reforms, the higher the expected per capita GDP growth rate of the given CEE country is. In what concerns the sub-national regions of the CEE-10, while no unconditional β-convergence has been shown, considerable country dummy effects have been identified, the predicted convergence/divergence rates varying with the model specification, the level of analysis and the time period covered. Five robust convergence clubs have been found to exist at the NUTS-3 level in the region. Compared to the endogenous nature of growth processes indicated by the OLS regression models, more sophisticated results have been found using quantile regression. Namely, only the regions in the top convergence club exhibit endogenous growth, while growth in the regions in the bottom club is of neo-classical type, the picture in the three middle ranking convergence clubs is highly individual-invariant specific and is not linearly related to initial regional GDP income levels.

The findings of the dissertation highlight, among others, that when evaluating convergence rates, special attention should be paid to the choice of the appropriate level of analysis. Restraining the analysis to only the national level and neglecting sub-national processes could be misleading from the perspective of long-term growth prospects. Similarly, the model approach adopted should be considered carefully, as the widely used pooled OLS regression is insensitive to panel fragmentation and therefore to possible differences in growth processes in the case of regions with different characteristics. A possible alternative for the growth literature that is worth being explored in further research is the recently developed quantile regression analysis.

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Abbreviations

CEE-10	Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, the Slovak Republic, Slovenia
EBRD	European Bank for Reconstruction and Development
EU	European Union
EU-9	Belgium, Denmark, France, Germany, Italy, Ireland, Luxembourg, and the Netherlands, and the UK
EU-12	Belgium, Denmark, France, Germany, Greece, Italy, Ireland, Luxembourg, and the Netherlands, Portugal, Spain, and the UK
EU-15	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Luxembourg, and the Netherlands, Portugal, Spain, Sweden, and the UK
EU-25	EU-15 plus Cyprus, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Malta, Poland, the Slovak Republic, Slovenia
EU-27	EU-25 plus Bulgaria, Romania,
ISPA	Instrument for Structural Policies for Pre-Accession
NUTS	Nomenclature of Territorial Units for Statistics
PHARE	Polish and Hungarian Assistance for the Restructuring of the Economy
SAPARD	Special Accession Programme for Agriculture and Rural Development
WIIW	Vienna Institute for International Economic Studies

Chapter 1 – Introduction

1.1 Background

The accession of the ten Central and Eastern European (CEE-10) countries to the European Union in the years 2004 and 2007, respectively, imported high levels of territorial disparity into the European Union (EU). To illustrate this, it is enough if we mention that in the year 2004 the aggregate contribution of the CEE-10 countries to the combined EU-27's GDP in purchasing parity standard (PPS) was a mere 5.4%, or that according to Eurostat statistics, per capita GDP expressed in PPS at the NUTS-2 level Inner London area for 2004 was EUR 65,123, while in the North-East region of Romania it was only EUR 5,070 (thus, while the region from Great Britain achieved a performance of nearly 303% compared to the EU-27 average, the Romanian region registered a mere 23.6% of the same average).

The large territorial disparities in terms of economic performance between the EU-15 and the CEE-10 countries have revived and keep fueling both the academic and the policy debate dedicated to evaluating the impact of European accession on production factor mobility and the economic integration prospects of the not only economically diverse, but also structurally heterogeneous areas of the enlarged EU.

In the broadest static conception, the debates related to regional income disparities can be summed up as the effort to understand the different factors that influence the steady state of different economics. The standard inquiry usually focuses

on the study of dissimilarity structures across a cross-section of observations and the identification of the most effective policies that would reduce these dissimilarities. In a dynamic perspective, the persistence and variation of territorial income disparities are understood as the process through which economies approach their steady state and the extent to which change in various explanatory variables influences the steady state to which the given economy is converging. Accordingly, every economy (not just national, but also sub-national, regional ones) has a steady state to which it tends to converge and which is subject to various conditions that constraint the given economy. Depending on the type and structure of the steady state appropriation process identified, different convergence processes can take place. However, by far is there any consensus over either the direction of the steady state appropriation process (i.e. whether there is convergence or divergence in the cross-section), or the speed with which it is occurring. The debate in this respect covers the levels of theory, methodology and the type of data to be used for characterizing the dynamics of territorial disparities.

In trying to ensure that the structural institutional factors which could limit the economic convergence of the CEE-10 countries to the same steady state as the one pursued by the EU-15 member states would be eliminated before the accession of the former, the EU imposed a series of conditionalities. Only those candidate countries could advance in the process of accession negotiations which showed significant progress in complying with the announced conditionalities. The conditionalities took into account that – besides the economic disparities at the time when the association agreements between the EU-15 and the CEE-10 countries were signed – there were also important disparities in terms of institutional and policy structures. As a result, the main emphasis of the overall enlargement process was on encouraging or even

imposing given institutional and policy reforms in accession countries as a precondition of accession (Grabbe, 2001).

The logic of influencing institutional choice in the CEE-10 countries through accession conditionalities was supported by the theoretical argument that political institutions are directly linked to economic growth performance through the influence they exercise on economic policy choices and the reduction of volatility risks (Persson and Tabellini, 2002; Acemoglu and Johnson, 2005). Empirical evidence on the relationship between democratic institutions and growth stability is provided also by Mobarak (2005), who concludes that growth volatility in democratic countries is significantly smaller than in the case of other countries, and therefore, on the long run, the growth performance in democratic regimes tends to be more robust compared to less democratic societies. Using cross-country regression, Hakura (2007) finds evidence that despite the strengthening of ties of local markets with international ones, in the case of developing countries and emerging markets domestic factors have larger growth volatility impact than international business cycles.

Based on the above, opting for the promotion of political, institutional and policy convergence was supposed to create the opportunity to enhance regional competitiveness and growth performance in the CEE-10 countries, which would allow the latter to achieve levels of economic development that are comparable to those of the older EU member states.

To understand the influence that accession conditionalities have had in the political and institutional transition path and the policy choices of the CEE-10 countries, a sub-field of the Europeanization literature has emerged. It is widely accepted that the European Commission had asymmetric power over old member states and candidate countries, since during the accession period it could impose institutional

choices on the latter through its gate-keeping and reform supporting incentive provision function (e.g. Grabbe 2001). Thus, as most authors conclude, by the end of the accession period institutional and policy convergence between the EU-15 and the CEE-10 countries was achieved in the sense that all the ten CEE countries became democratic societies and open market economies.

The enlargement policy adopted by the EU in terms of political, economic and legal conditions became in fact a politically unavoidable agenda setting for the national governments of the CEE-10 countries. The analysis of the European integration imposed institutional and policy transformations in the CEE-10 countries, which are expected to influence the returns of integration, becomes important in order to provide a better understanding of the way in which EU conditionalities influenced the transition path of these countries.

The decision of the CEE-10 during the early times of transition to join the European common market and the political structure of the European Community (Union) constituted an important set of controls on the developmental path of these countries, which involved the adoption of a series of political decisions related to the extent of institutional and administrative reform and trade liberalization. International trade theory suggests that the main result of trade liberalization and the following economic integration is change in the ways in which factors of production will target different locations according to their likelihood to provide the highest return on investment (e.g. Rodríguez and Rodrik, 2000; Alho et al, 2005; Kose et al, 2006).

1.2 Statement of the problem

The issue of the extent and structure of the territorial disparity that has been imported into the economic space of the enlarged EU by the accession of the CEE-10 countries is extensively studied and vividly debated. Central to the debates on the economic equilibrium impact of supra-national integration is the question whether newly acceded economic territories will converge to a similar steady state as their Western counterparts or whether the existing East-West divide within the EU will be a long-lasting one. In the meantime, the question of how accession related national policy reforms contributed to the appropriation of similar/ dissimilar equilibrium conditions within the CEE-10 region itself remains understudied. Given the fact that the CEE-10 countries underwent comparably similar transformation processes in the same period of time and that the contexts for their development are similar, there seems to be a hidden assumption that growth in the Eastern part of the EU occurs in a more balanced way, the only differences being attributed to the individual-invariant characteristics of sub-national regions.

This dissertation wishes to discuss to what extent the above mentioned assumption holds true. Its main goal is to provide insights on how the reform and accession period, more precisely the macro-economic policy reforms and the EU accession conditionalities (especially those in the field of regional policy), influenced growth in the CEE-10 countries, and whether or not policy change led to any convergence within the region of the CEE-10 countries.

The possibility for convergence within the region is present. All the ten countries implemented major macro-economic policy reforms and embarked on regionalization. The political, institutional and policy reforms implemented in the field of regional policy in each of the ten CEE countries following the "lost decade" of the

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1980's are considered to play a significant role in the long-term growth performance of the local economies in these countries.

In the case of regional development policy, the institutional and policy convergence mentioned in the previous section was sought to be achieved through the creation of regional administrative capacity for the management of the Structural Funds. This required, among others, the setting up of further sub-national territorial areas in line with the NUTS structure, the development of the national legislative framework for regional policy planning, the creation and strengthening of institutional structures both at national and regional levels for the implementation of the structural instruments, as well as the enhancement of programming capacity and financial management and control. By considering the principles of the European regional policy when designing sub-national governance systems, the CEE-10 countries adopted a direction of regionalization based on the influences of the Western European model. To what extent do meso-level government tiers in the different CEE-10 countries actually correspond to the cohesion region concept is another question that this dissertation wishes to answer.

Furthermore, it seeks to improve our understanding of the ways in which the adoption of new forms of territorial governance influences the generation and the distribution of economic gains across sub-national regions in transition contexts. It could be expected that the weak institutionalization of sub-national governance regimes increase the likelihood of unbalanced growth. In this context, the dependence on central government grants, for instance, limits the possibilities for local initiatives that would induce more growth enabling regional development policy. On the other hand, strong regional institutions are likely to provide regional public policy entities with a series of context specific opportunities for using given instruments of regional policy,

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which would enhance the competitiveness and thus the growth performance of sub-national regions.

Another debate that this dissertation touches upon is that the empirical results of the numerous studies that use the framework of the Solow-Swan type neo-classical growth models and those that apply the Romer and Lucas endogenous growth theory seem to be irreconcilable. As it is detailed in the literature review, the main difference in the approach of the two types of growth models is that according to the neo-classical ones, if poor and wealthy economies only differ in terms of their initial level of per capita GDP (more precisely, they face the same technology and preferences), poor economies grow faster than rich ones and inequality tends to disappear in the long run. If poor and rich economies differ in other aspects, too, then inequality may not necessarily be eliminated, but the distribution of relative income per capita will still stabilize. On the other hand, according to endogenous growth models, rich economies grow faster than poor ones, so inequality continues to increase. By testing the convergence hypotheses formulated, this dissertation also seeks to discriminate between these growth theories.

1.3 Purpose of the dissertation

Given the issues identified in the previous section, the dissertation proposes to examine the tendencies of growth and convergence in the region of the CEE-10 countries under the influence of macro-economic and regional policy reforms. Thus, it will link policy change, economic growth and convergence in the context of supra-national political and economic integration, contributing to the related academic debate along both empirical and methodological lines.

More precisely, the dissertation is dedicated to the study of the extent to which macro-economic policy reforms and European accession conditionalities can be related to regionalization processes, sub-national per capita GDP income growth and convergence in the CEE-10 countries.

Related to the debate on the relationship between policy and institutional change and growth performance a series of interrelated questions emerge, from among which this dissertation will deal with the following ones: How does the implementation of macro-economic policy reforms in the CEE-10 countries influence growth performance? How does the implementation of regional policy influence the spatial distribution of growth?

The second set of questions that the dissertation wishes to address relates to empirical aspects of growth processes and could be formulated as: To what extent are the gains in growth performance distributed among meso-level regions in the CEE-10 countries? Do growth rates in the CEE-10 countries lead to income convergence in the region?

The specific research questions formulated to realize the objectives of the dissertation are the following:

First research question

RQ1. *Have macro-economic policy reforms carried out in the CEE-10 countries in the transition period significantly induced per capita GDP income growth?*

Second research question

RQ2. *Have European accession related conditionalities significantly influenced the design of regionalization processes in the CEE-10 countries?*

Third research question

RQ3. *Is there unconditional β-convergence across the CEE-10 countries?*

Forth research question

RQ4. *Is there conditional β-convergence at NUTS-2 and/ or NUTS-3 levels in the CEE-10 countries?*

Fifth research question

RQ5. *If there is β-convergence among the CEE-10 countries at national and sub-national levels, could σ-convergence be also observed at any of these levels?*

Sixth research question

RQ6. *Do OLS regressions produce different convergence rates predictions depending on the level of data aggregation and sample selection?*

Seeking to identify robust empirical evidence for the hypotheses formulated involves the use of both comparative qualitative analysis, the cross-referencing of different regression methods and the verification of the assumptions that they impose on the data. To achieve the latter, following the estimation of an unconditional pooled OLS regression, I perform two alternative methods of constrained least square dummy variable regressions by including country dummy variables. For each regression, I carry out robustness tests including special homogeneity, outlier and normality tests. This is followed by the estimation of a least-absolute value model to verify whether the possible convergence/ divergence processes occur in a non-linear way.

In the case of each estimation, I verify the sensitivity of results to different levels of data aggregation (NUTS-2 and NUTS-3 level data) and different periods of time for the sub-national regions in the CEE-10 countries. By doing this, I seek to provide insights into the various pitfalls of different quick hand methods of deriving overly enthusiastic convergence rate figures.

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1.4 Relevance of the dissertation

Studying what drove and hindered growth in the CEE-10 countries during EU accession negotiations can provide indications on how stable the growth performance in the newly acceded CEE-10 countries is. This is important having in mind that – analyzing the situation in Hungary and Poland – Csaba (2005) argues that in the case of transition countries there is a risk of growth deceleration that is attributable to a slow-down of institutional building following the first wave of institutional reforms. In the author's view, the lack of continued institutional building jeopardizes further economic growth. Hausmann et al. (2006) draw attention to the risks that medium and long term output contractions have under conditions of deceleration of merchandise exports, which are directly linked to existing productivity gap and increasing pressure for increasing wages in the CEE-10 countries. This again reiterates the importance of institutions that could internalize the early warnings of export slow-downs and could adopt effective targeted policies.

The systematic evaluation of the structure and strengths/weaknesses of the institutionalization of the meso-level governance tier in the CEE-10 countries in a context in which two competing regionalization levels are present at the same time both across and within countries provides an ideal ground for testing the research hypotheses and a better understanding of the different convergence/ divergence processes present at the regional level. If the supposed limited compliance with EU expectations is found to be sustained by evidence, this would have important theoretical implications for many of the estimates of cross-country comparisons. At the regional policy level, the verification of the hypothesis would imply that current assessment methods of the performance of regional policy measures should be revised to include a set of indicators

that can account for context specific variables. At the EU level, this would imply that institutional diversification in various policy fields might provide more effectiveness in achieving economic development goals than the push towards institutional standardization.

The methodological discussion of how to accurately estimate per capita income convergence/ divergence at the level of NUTS-2 and NUTS-3 regions in the CEE-10 countries can be of special importance for the assessment of wider European convergence processes. The fact that the widely used linear pooled OLS regression model systematically estimates a 2% annual convergence rate suggests that it might suffer from missed variable bias, outlier effects or heteroscedasticity. Neither of these sources of error can be neglected, and therefore alternative testing methods are applied to verify the validity of pooled OLS regression results.

If the analysis were restrained exclusively to ordinary least square analysis, it could entail several possible pitfalls given the identification problem that needs to be dealt with as part of the analysis. The important conceptual problems that such an approach raises require careful attention and intellectual alertness to the interactions among the different fields of governmental activity.

Last but not least, the inclusion of Bulgarian and Romanian regions in the sample under examination is likely to provide new insights into the overall performance of the CEE region.

1.5 Structure of the dissertation

The study is structured in eight chapters. The first chapter provides an introduction to the context of the research, presenting the background, focus, main research questions, relevance and structure of the dissertation.

The second chapter introduces the relevant academic debates by providing a review of the main theories of regional growth related to the sources of economic growth and the long-term expectations in terms of the overall outcomes of growth policies. This section is followed by a short presentation of the various perspectives on the role of the public sector. Then I go on to introduce the main arguments of the Europeanization literature for explaining the various effects that EU policy might have on the institutional options and policy choices of the CEE-10 countries. These discussions are followed by a review of the main convergence concepts and the main findings of research centered on these concepts.

The third chapter describes the research methodology, presenting the data sources and the methods used to verify each of the formulated hypotheses. The last section consists of a more detailed presentation of the data sources used in the dissertation.

The forth chapter serves the purpose of presenting the political and economic context in which regionalization processes took place in the CEE-10 countries prior to their EU accession. First I discuss the macro-economic reforms carried out, namely the privatization of state owned enterprises, the restructuring of enterprises, trade and price liberalization, the reform of competition policy, the banking reform, and overall infrastructure reform. Then I go on to analyze the evolution of the economic performance in the CEE-10 region. In the last section, I focus on the relationship between macro-economic reforms and growth.

The fifth chapter discusses the external constraints for the institutional and policy choices of the CEE-10 countries when developing regional policy and capacities to manage the Structural Funds. In the first section I present the main stages of the emergence and evolution of regional policy at European level and the challenges of its implementation. Then I discuss the EU factors influencing the enrooting of regional governance in the CEE-10. Finally, I deal separately with the EU conditionality in the field of regional policy.

The sixth chapter starts with a short discussion on the main arguments of the decentralization debate, followed by a comparative analysis of the reform of meso-level governments and the parallel regionalization processes in the CEE-10 countries. The scope of the chapter is to assess the new institutional structures in the field of regional policy-making and their compliance with the related EU requirements.

In the seventh chapter I carry out the statistical analysis of unconditional and conditional β-convergence, σ convergence and club convergence in the case of the regions of the ten country cases. The modeling approaches include pooled OLS, two variants of constrained least square dummy variable models and the least-absolute value model. Standard robustness tests are also carried out to verify the results predicted by the different modeling approaches.

The last chapter sums up the main findings and conclusions of the dissertation.

Chapter 2. Literature Review

2.1 Introduction

As stated in the introductory chapter, one of the purposes of this dissertation is to contribute to the discussions on the causes of growth in given societal contexts. More precisely, it wishes – among others – to look into what has moved the CEE-10 countries from the stagnation of the 1980's to a sustained path of economic growth since 1995. There are two main sets of possible explanatory variables widely explored in the literature that are generally used to explain growth, namely the macro-economic and institutional-policy related variables. As discussed earlier, this dissertation seeks to contribute to the stream dealing with the institutional or policy relevant factors of growth. However, by no means is this to imply that macro-economic factors are negligible, but rather that institutions are considered to define the context of individual action and thus to set the framework for macro-economic outcomes.

Since this dissertation wishes to empirically establish a link between growth and institutionalization in the context of the CEE-10 countries, this chapter starts with presenting the relevant arguments in growth theory and then it goes on to discuss the main views on the role of the public sector as well as on the influence of the Europeanization process. Reviewing the main theoretical arguments of the relevant strands of literature allows for the identification of the main economic factors that could

explain particular regional growth performances and of the key context variables that have influenced the emergence of meso-level governance systems in the CEE-10 countries, covering both endogenous and exogenous socio-economic factors as explanatory variables of different institutional outcomes and their impact on policy choices and thus on growth prospects. Last but not least, given that one of my ultimate goals in this dissertation is to find out whether or not growth acceleration in the CEE-10 countries has led to convergence within the CEE-10 region in particular, I also review the main convergence concepts used in the literature.

The scope of this chapter is to provide a description of the main theoretical findings in the related strands of literature, highlighting also possible contradictions in what concerns the theoretical expectations about the performance of various forms of institutionalization in terms of delivering growth enhancing policy environment.

The review of the relevant theoretical debates on the relationship between institutionalization and growth performance provides the necessary conceptual instruments for the development of the research design in order to verify the validity of the formulated research hypotheses and for linking back the findings of this dissertation to the main debates in the field.

2.2 The institutional sources of economic growth

Considering the different intellectual origins of the literature, first of all it is essential to operationally define the concept of institutions to be used throughout this dissertation. Institutions have a dual interpretation of being either rules of the game or governing structures. In the first interpretation institutions serve the purpose of establishing the forms of interactions among individuals. As North (1990) formulated it, institutions are

"the humanly devised constraints imposed on human interaction". Research in this conception emphasize, for instance, the role played by property rights (Acemoglu and Johnson, 2005), political accountability and the democratic character of institutions (Bates et al., 2004), government economic policy (Hausmann et al., 2005), the ways in which norms and perceptions influence individual behavior and social choice (Furubotn and Richter, 2005). In the second interpretation institutions are governing structures of economic activities, such as firm structures, company level organizational culture, the organization of labor market institutions (e.g. Dornbusch, 1993).

Of the two interpretations this dissertation adopts the first one, assuming that more democratic and predictable political institutions are favorable for the emergence of more secure property rights and lead to policies that are less distortionary, which in turn encourages economic actors to undertake long-term investments in both physical and human capital and thus to enhance macro-economic factors, such as labor productivity and R&D investments.

Since the seminal work of North (1990) and Stiglitz (1989, 1994), the fact that institutions matter for the economic growth performance of a country has increasingly been accepted and the need to understand the way they actually matter became the subject of debate in the political economy literature (Blahó, 2005; Csaba, 2007). In the context of the CEE-10 countries the most relevant question in this respect could be formulated as: how exactly does democratic governance relate to economic development and growth? Rodríguez and Rodrik (2000) find evidence that democratic rule of law is more likely to reduce growth volatility compared to other forms of political regimes. Similarly, in a context of cross-country comparisons, Mobarak (2005) finds that growth volatility in democratic countries is significantly smaller than in the case of other countries and therefore, on the long run, the growth performance in

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democratic regimes tends to be more robust compared to less democratic societies. Rodrik et al. (2004), in an analysis of the role of institutional, geographical and trade related factors on income levels, reach the conclusion that the quality of institutions are definitory, and once controlling for these factors both geography and trade are only weakly if at all systematically related to income levels. Sturn and De Haan (2005) show that respect for democratic political rights and fundamental civil liberties are strongly related to growth performance. Gwartney et al. (2006) indicate that the quality of institutions is positively related to the ability of the economy to attract private investment, yielding higher growth per unit of investment. Using cross-country regression (including 87 developing countries and emerging markets over the period 1970-2003), Hakura (2007) finds evidence that despite the strengthening of ties of local markets with international ones, in the case of developing countries and emerging markets domestic factors have larger growth volatility impact than international business cycles. Teler (2007) concludes that inducing growth is a challenging task in the case of undemocratic societies with high levels of income disparity and high levels of bureaucratic and judicial corruption.

Kaplan (2000) argues that in order to democratize without output fall countries need to satisfy a series of preconditions to avoid instability and the risk of falling into social and economic chaos. In this line, Zagha et al. (2006) draw attention to the dramatic output fall in the CEE-10 at the beginning of the reform process, which despite sustained growth in most countries was recovered only by the best performing economies. In contrast, Rodrik and Wacziarg (2005), using cross-country regression of a sample of 154 countries for the period 1950-2000, find evidence that democratization does not produce a drop in the growth rate of countries. These seem to suggest that

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democratization in itself does not produce long-term growth decreases, so it needs to be complemented with comprehensive institutional reforms as well.

Given that this dissertation studies, among others, convergence processes in the region of the CEE-10 countries, I have chosen to group the different growth models according to their economic convergence predictions. Thus, I identify two main groups of growth models: on the one hand, there are the models that predict some sort of convergence and, on the other hand, the ones that rather predict divergence. The models in the first category are based on the neo-classical growth theory of Solow-Swan (1956, 2001), while those in the second category build on the endogenous growth theory influenced by Arrow (1969) and developed by Romer (1986), Lucas (1988), Grossman and Helpman (1991), or on the economic geography theory first formalized by Krugman and Venables (1990). The contrasting predictions result from the different assumptions made regarding the properties of the production function at a given time and the dynamics of technological progress.

Neo-classical growth models (Solow, 2001) suppose diminishing return on investment, which favors poor regions with less capital, making it possible for them to grow faster than rich ones. In contrast, endogenous growth models see investment presenting increasing returns, and thus they predict divergence. According to these latter models, the higher the stock of capital is, the more the return on investment increases, so rich regions continue to grow faster and inter-regional inequality increases further. In this sense, both private and public investments are likely to contribute to regional development by reinforcing agglomeration economics.

In what concerns technological progress, neo-classical growth models see a tendency towards the equalization of technical efficiency levels, claiming that the accumulation of technical capital leads to decreasing return. Furthermore, if less

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advanced countries have the capacity to adapt foreign technologies to their own needs, they can save the money and time needed for the development of the new technology, which results in technological catch-up and thus convergence. Endogenous growth models, on the other hand, assume that if the efforts of countries to generate or absorb new technologies differ in intensity, the countries will have different growth rates.

To sum up the main difference in the approach of neo-classical models and that of endogenous growth models, we can say that according to the first ones, if poor and wealthy economies only differ in terms of their initial level of per capita GDP (more precisely, they face the same technology and preferences), poor economies grow faster than rich ones and inequality tends to disappear in the long run. If poor and rich economies differ in other aspects, too, then inequality may not necessarily be eliminated, but the distribution of relative income per capita will still stabilize. In endogenous growth models, rich economies grow faster than poor ones, so inequality continues to increase. Considering these, convergence tests are natural instruments to discriminate between growth theories and thus could provide valuable insights in terms of the different factors that produce growth.

According to geographic economics models, by reducing transaction costs between regions, regional integration may lead to inequality. Similarly to endogenous growth models, the assumptions are made starting from economies of scale, imperfect competition and localized spillovers, which create a cumulative causation process, increasing regional differences.

According to Krugman (1991), if economic integration implies that transport costs fall below some critical level, all industries will tend to concentrate in one region. In Krugman and Venables (1995), regional concentration of industries can also occur if trade costs fall below a certain threshold, but this concentration is likely to lead to a rise

in wages because of labor immobility, which already has a dispersion effect. The model of Puga (1999) incorporates both approaches, showing that labor mobility towards regions with higher real wages would increase agglomeration, but without labor mobility, wage differences moderate agglomeration.

Coming back to neo-classical theory based models, most approaches assume free competition, full employment of factors of production, and full mobility of labor capital. The underlying thesis emerges out of these assumptions, i.e. that in any given society territorial economic disequilibrium is a temporary problem in the context of a general system of economic equilibrium. Regional disparities are conceptualized as being produced by systemic level inefficiencies, and once these are dealt with, regional economic disparities vanish, and in the long run regional policy looses its rationale.

These findings are theoretically sound if considering the steady state approximation assessed by macroeconomic general equilibrium models. However, once starting to allow for the relaxing of their assumptions, for example by tolerating certain levels of factor rigidities, it becomes increasingly challenging to sustain these conclusions. For instance, there are some region-invariant characteristics that even under conditions of full factor mobility and lack of policy rigidities influence the steady state approximation process. To handle the problems raised by factor of production rigidities, the theoretical solution is to devise various government based solutions, such as policy intervention possibilities, to compensate for or correct the distortion effects.

For instance, in the social overhead capital approach, based on the Hirschman-Rodenstein-Rodan concept, government policies are evaluated as a method to compensate for certain factor rigidities. The core provision of Hirschman (1958) is that public investment can lead to the productivity improvement of the different factors of production. The condition for this possibility to turn effective is that public capital

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investment should be complementary to private factors. The interaction between infrastructure and the growth rate of labor and capital investment depends upon the complementarity condition of public investment to private capital. In the case in which infrastructure is a substitute for privately provided factors, the higher public infrastructure investment is, the lower labor and capital inputs are. If infrastructure investment complements private inputs, the increase of public infrastructure investment leads to an increase in labor and capital inputs. Another choice that policy-makers are faced with is to determine the optimal timing of infrastructure investment. One possibility is to anticipate growth by providing infrastructure ahead of demand. This strategy, called by Hirschman "development via surplus", involves the selection of regions and industries that could be future leaders of growth. The other policy option, called "development via shortage", is to wait until there is sufficient productive activity to create pressure for investment in infrastructure.

According to Biehl (1978: 58), public sector induced regional growth can be the result of two different policies. One such policy is to enhance the existing social overhead capital capacities, while the other option is to invest in unused resources while letting the market create sufficient demand for the existing social overhead capital. Blahó (2005) considers that while growth is a precondition for cohesion, convergence can be achieved only if competitive advantage is created in the catching-up regions through the adoption of the appropriate economic policies.

The policy choice of infrastructure provision can prove to be either the source or the drag of regional development. Back in 1965 Hansen already stated that the effect of infrastructure investment also depends on the existing level of development in a given region. His classification of regions, which depends on the relationship between productive activities and the existing level of infrastructure, is still widely used to date.

Accordingly, there are three types of regions: congested, intermediate, and lagging. Congested regions are characterized by high levels of productive activity compared to the level of infrastructure. In the case of these regions further infrastructure investment might lead to further development if the complementarity condition is fulfilled and the congestion effect is surpassed.

In the case of intermediate regions the preconditions for high productive activities, e.g. labor abundance, are present. Yet, the lack of core infrastructure, such as power networks, transportation or communication, leads to bottlenecks. Specific to lagging regions is the shortage of productive factors, so they only have limited capacity to attract productive activity.

Hansen (1965) considers that infrastructure investment is most productive in intermediate regions. In the case of congested regions congestion and externality factors might reduce the effects of infrastructure investment. In lagging regions the support provided by infrastructure investment cannot be efficiently exploited due to the existing structural productive capacity weaknesses.

According to authors such as Heckscher and Ohlin, factors of production target locations that are able to provide the highest return (Heckscher, 1991: 62; Ohlin, 1991: 91-94). The resulting flow of resources towards underdeveloped regions leads to an increase in the competition for factor prices. In time, the returns of factor investment equalize in all regions, leading to a general system of economic equilibrium.

Policies driven by price equilibrium laid such a hard burden on the economic development budgets that they often became unsustainable both economically and politically (this was even stronger in less developed countries). Nevertheless, allowing the free movement of factors of production leads to a context favoring leading regions.

According to Myrdal's cumulative causation model, the advantage of economically advanced regions is not necessarily malefic (in Armstrong & Taylor, 2000). Relying on their strategic advantage, which can be of location, infrastructure and so on, these regions produce agglomeration of economic activity. This is reinforced by the ability of these regions to attract further investment, as they can provide higher rates of return than less developed regions. By the same token, backward regions suffer from the effects of their relative backwardness, e.g. brain drain and the loss of private investment in favor of the advanced regions. However, developed regions soon spread out into backward ones, because underdevelopment involves lower factor prices, natural resources and so on. As a result, backward regions start to develop. According to this theory, the appropriate policies have a central role, like the ones targeting to discourage certain investments in developed regions, and redirect them to underdeveloped regions.

The dynamic disequilibrium perspective lies on Schumpeter's (1959: 61-64) observation that capitalist production is in continuous systemic change, therefore the economy is in continuous disequilibrium. If leading regions do not innovate at a sufficiently high degree, their products may become less competitive. At the same time, lagging but innovative regions may take the lead in the production of new or enhanced products, thus initiating a domestic development process.

2.3 The role of the public sector

Historically, territorial states played an important role in influencing macroeconomic standings and in determining national development paths (Weiss & Hobson, 1995). Governments still commonly perform functions of direct provision of goods and

services, redistribute income, and regulate economic relations (Musgrave & Musgrave, 1989: 3-14; Inman, 1987: 647). This role manifests in adopting and implementing different policies of industrialization, modernization, urbanization, the provision of public education, healthcare, pension systems and many others.

There is a clear rationale for governments to play an economic role. It is inherent in the nature of non-regulated markets that certain conditions leading to what is known as market failure may emerge (Scitovsky, 1954; Kreps, 1977; Inman, 1987). Such conditions include information asymmetries, externalities or external economies' market failure, monopolies or monopsonies. These are the conditions most commonly seen as legitimating the intervention of states in economic development.

According to Hausmann, Rodrik and Velasco (2005), policy reforms are the responses of decision-makers to distortions and imperfections that are present in the market. In what regards the possible sources of distortions, the authors distinguish between those which are government imposed and those that can be related directly to the operations of markets. Thus, reform can be oriented not only towards enhancing the functioning of the market, but also towards reducing the extent of government imposed distortions, since the latter produce sub-optimal source allocation, and thus keep the economy below the attainable productivity frontier.

The study of government imposed distortions leading to market imperfections – and thus to poorer growth performance of economic units – is of special relevance in the case of Central and Eastern European countries given the fact that these countries have undergone large scale policy readjustments. The theoretical argument to evaluate the impact of government imperfections on growth performance emerges from the perspective of the impact they have on the structure of capital/ labor-augmenting efficiency, which refers, among others, to the quality of policy in a given country. For

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reasons of simplicity much of the production function analysis assumes neutral technology change among production inputs, such as private, public capital or labor inputs. Nevertheless, the reform of policy-making implies change in the structure of technological change under which the market operates, and therefore produces readjustments in the steady state of the economy, for instance by imposing various transaction costs on market exchange.

The impact of policy reforms can be evaluated from the perspective of at least three types of technological change processes. First, government imposed distortions may have an impact on the structure of factor augmenting innovation (technological change), which is commonly considered to be Hicks neutral in the situation in which the factor augmenting parameters are identical, resulting that inputs are not substitutes to each other. Second, the distortions could have an impact on the efficiency of inputs change, but decline is exclusively labor augmenting, which infringes the Harrod neutrality assumption. Last but not least, distortions can be exclusively capital augmenting, implying that all negative costs related to government imposed market distortions are internalized by the producer side (this is when distortions contradict the Solow neutrality assumption).

Government imposed distortions impact on technological change processes through the costs they impose on market transaction and on political transaction. The fundamental observation of the transaction costs theory is that when agents engage in economic activity involving product exchange they expose themselves to risks if relying exclusively on the price mechanism as the co-ordination mechanism of their interaction, specific to markets. These risks emerge from different sources, of which the most extensively discussed ones are the possibility of ex-post and ex-ante opportunistic behavior, information asymmetries, transaction costs and/or to the

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impossibility to account for all the potential contingencies specific to the unpredictability of the environment in which the economic activity is undertaken. In seeking to understand the choices made by actors, the transaction costs literature conceptualizes that agents seek to minimize the transaction costs.

Another strand of the literature dealing with the role of the public sector studies the decreasing relevance of the state as a social actor in democratic societies (e.g. Ohmae, 1991; O'Brien, 1992; Grindle, 1996; and Mansbach, 1999). The most prominent reason for the decreasing role of the states is considered to be the strengthening of the pressure to decentralize state authority (for a more detailed discussion on the decentralization debate see section 6.2). This is the supposed scenario when "with national efficiency and regional development no longer two aspects of the same growth strategy but competitive with each other, territorial questions became more highly politicised" (Keating, 1988: 167).

The key feature of the decentralization process is the allocation of state authority among levels of governments. Multi-tier policy-making has been characteristic of federal states for a long time, but the traditionally influential continental doctrine of centralized nation states only started to lose ground to demands of state authority devolution in the last decades.

The environment in which meso-level policy agents act varies according to the state they belong to. In his book focusing on five Western democracies (the United Kingdom, France, Italy, Germany and Spain), Keating (1999) treats the issue of state centralization and decentralization as the effect of different traditions. In his view, three such traditions can be identified. The French tradition is that of a strong and centralized state; in the post-war German experience power is conceived as being

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shared among the länder and the federal state; while the British have developed a doctrine of local governments within the unitary state (also in Stoker, 1991).

Keating (1999: 18-22) argues that the policy-making style of states becomes relevant not only for territorial states employing different sovereignty principles, but also for nation states. The author's conclusions are reinforced by Ieda (2000), who states that "there is no uniform system of local government nor consensus among people even within a community on this issue" Ieda (2000: 4).

2.4 The Europeanization process

Although the concept of Europeanization is a relatively new one, the literature dealing with it is extensive. Despite the several existing definitions of the concept, we can say that in general the Europeanization literature aims at providing a deeper understanding of the processes related to the European Union. Radaelli (2003) points out that Europeanization is not to be confused with convergence, the former being a process and the latter its consequence. The formal definition of the Europeanization process is enounced by Radaelli (2003: 30) as follows:

> "[Europeanization] consists of processes of a) construction, b) diffusion and c) institutionalization of formal and informal rules, procedures, policy paradigms, styles, 'ways of doing things' and shared beliefs and norms which are first defined and consolidated in the EU policy process and then incorporated in the logic of domestic (national and sub-national) discourse, political structures and public policies."

The earlier studies on Europeanization mainly focus on the old EU member states, while a more recent strand of the literature deals with the applicant countries/new

member states (e.g. Grabbe, 2001; Schimmelfennig and Sedelmeier, 2005). Two main approaches are used, namely the bottom-up approach and the top-down approach.

The part of the literature using the bottom-up approach seeks to provide an insight into the policy transfer from the national level to the European level, the so-called 'uploading' (e.g. Börzel 2003). What is examined is how governance and institutions are developed at the European level. As a result, research using the bottom-up approach focuses on the actors involved and the power relations in the process of policy transfer as well as the nature and degree of this transfer. This approach has been criticized (e.g. Bulmer and Radaelli 2005) on the grounds that Europeanization should not be used as a synonym for European integration.

A much larger number of studies adopt the top-down approach, focusing on how the EU influences the domestic level. Within this latter strand of the Europeanization literature, there are numerous analyses on how state actors deal with the requirements established by the EU and how these requirements affect their activity (e.g. Börzel 2003, Falkner et al. 2005). More recently, some authors (e.g. Berg 2004, Saurugger 2005) have started to study Europeanization in the case of non-state actors as well, such as interest groups or civil society organizations.

Other studies advocating for the top-down perspective examine how the EU impacts the various policy fields (e.g. Bulmer and Radaelli 2005). Studying the influence of EU policies on the national level, Knill and Lehmkuhl (2002) distinguish among three types of Europeanization. The first one is "Europeanization by institutional compliance", when the EU sets precise requirements regarding the institutional setting to be adopted by the member states. The second one, "Europeanization by changing domestic opportunity structures", implies that the EU

exercises a more indirect influence by inducing a change in the distribution of resources and power among the actors involved in the decision-making at national level. The third and even less direct type of Europeanization occurs "by framing domestic beliefs", when the ground needs to be prepared for the acceptance of new ideas in the member states.

More recently, socialization as a result of Europeanization has also been under study. Socialization covers the interaction and interdependence among the actors operating at European and domestic levels, as well as the process through which norms and values are transferred (Radaelli and Pasquier 2006:43). Pasquier (2005), for instance, examines how French and Spanish regional actors use the European model of local development to which they have been socialized to implement their own policies. This study is one of the relatively few that focuses the analysis on the sub-national level, since in general it is changes in national policy-making that are in the center of attention when the impact of the EU is examined.

The challenge for the studies adopting a top-down approach is to find an explanation for the fact that the impact of the EU is different in the member states. In this sense, Europeanization is considered as the independent variable and domestic adaptation as the dependent variable.

A major debate is centered on the idea of "goodness of fit". On the one hand, there are authors (e.g. Duina 1999, Börzel 2003) who consider that the implementation of EU policies depends on how well the latter "fit" the existing national policies, since this enables national decision-makers to preserve the status quo and furthermore, the adaptation costs are low. On the other hand, authors such as Haverland (2000) and Treib (2003) argue that in some cases national decision-makers may want to change the status quo and thus it is in their interest to implement even "misfitting" policies.

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When examining the influence of the EU on CEE governance, Grabbe (2001: 1020-1028) identifies five categories of mechanisms used by the EU to induce change, namely "gate-keeping" (since a country can engage in the accession process only if it meets certain conditions), benchmarking and monitoring, offering legislative and institutional templates, providing funds and technical assistance, as well as advice and twinning. The author, however, points out that the EU's influence on CEE governance is "diffuse", the induced change reaching different levels in the different institutions, policy fields and countries. She also underlines that EU pressures interact with domestic processes and other exogenous pressures. This interaction is not yet dealt with adequately in the Europeanization literature, which - according to Bulmer (2007), for instance - tends to over-determine the EU factor when explaining domestic change, neglecting the influence of non-EU related, international and national factors, such as globalization or endogenous processes going on in the domestic system.

Some scholars explain Europeanization by the behavior of the actors involved. According to the representatives of rational institutionalism, the actors are rational and oriented towards achieving their goals, which requires that they exchange their resources with the other actors involved (Börzel 2003). This implies both opportunities and constraints for them. In this line of thinking, the EU constitutes an external constraint, but at the same time it provides additional resources for actors to reach their goals and can even redistribute resources between actors. For the latter to happen, there has to be a lack of correspondence between EU requirements and the national structures so that an adaptation process should be required. From the perspective of sociological institutionalism, actors' behavior is determined by social expectations and institutions guide actors in terms of what their interests are and what acceptable ways there are to pursue these interests. In this sense, the EU sets new norms to be followed by the

member states and Europeanization is easier when there is no large difference between these EU norms and the norms of the member states (Börzel 2003).

A central question in the Europeanization literature focusing on the influence of the EU at the national level is whether the end result will be convergence of policies and polities throughout the EU or the persistence of national particularities. There is no consensus among authors in this respect. Evidence has been presented for both, so Risse et al., for instance, speak about "domestic adaptation with national colors" (2001:1) and Featherstone and Radaelli (2003) concludes that convergence is a result but not an inevitable one. Börzel (2003:15) distinguishes five possible outcomes, namely inertia, when there is no change; retrenchment, when resistance to change results in even less compliance; absorption, when EU requirements are integrated into the domestic political system but without a significant change to the existing structures; accommodation, when national policies are adapted to EU requirements while preserving the core features of the former; and transformation, when the domestic structures are basically changed or replaced. In what concerns measuring the outcomes of Europeanization and the degree of change induced by the process, the literature does not yet seem to be able to provide a satisfactory answer. This is mainly due to the fact that the Europeanization has multi-dimensional, both direct and indirect effects, and as Falkner et al. (2005), for instance, point out, they need to be analyzed on various levels. Initially, the literature mainly focused on policy, but more recently it has been recognized that the domain of impact can include political structures and processes, state and non-state actors, etc. The issue of measuring the influence of the EU becomes even more complex if the bottom-up and top-down approaches are combined, resulting in a bottom-up-down design for the study of Europeanization, which according to Haverland (2005), for instance, is the most appropriate approach.

2.5 Convergence processes

The extensive efforts made within the European Union to reduce disparities among the regions have geared large interest in examining the process of convergence and evaluating its efficiency. As a result, numerous studies have been published recently on convergence/ divergence processes, also providing empirical verification of the theoretical provisions of the various growth models presented in the first section of this chapter. Different empirical methods and approaches have been used to deal with the issue, leading to rather different findings.

The main strands of the convergence literature can be distinguished based on the convergence concepts they focus on. The three core convergence concepts are β-convergence, σ-convergence, and club convergence.

In the case of *β-convergence*, which has Solow's neoclassical growth theory at its basis, we can distinguish between the absolute/unconditional convergence hypothesis and the relative/conditional convergence hypothesis. The first one stipulates that all regions converge to the same steady state, implying that income in poorer economies tends to grow at a faster pace until catching up with income levels in richer regions. The conditional convergence hypothesis assumes that economies converge towards their own steady state subject to their initial individual-invariant characteristics, and as a result regional income disparities do not disappear.

De la Fuente (2000: 37) points out that in principle unconditional and conditional convergence differ sharply, but in practice the conditioning variables introduced in the conditional convergence model also change in time and often show convergence themselves.

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The absolute/unconditional convergence model was introduced by Barro and Sala-i-Martin (1991, 1992), who – by applying growth regressions – found that when the annualized growth rate of regions had the initial level of income as a robust proxy, absolute convergence could be observed. The slope of the growth regression was interpreted at the rate at which the regions under focus were approaching their common steady state. Following Barro and Sala-i-Martin (1996), Cuadrado-Roura (2001) and López-Bazo (2003), for instance, find evidence only for a small convergence rate in the case of Belgium, Denmark, France, Germany, Greece, Italy, Ireland, Luxembourg, the Netherlands, Portugal, Spain, and the UK (the EU-12) in the periods 1977-1994 and 1975-1996, respectively. Yin, Zestos and Michelis (2003), on the other hand, prove U-shaped convergence speed in the EU-15 (the EU-12 plus Austria, Finland, and Sweden) over the period 1960-1995, the lowest point being at the beginning of the 1980s. Their findings are confirmed by Basile, de Nardis, and Girardi (2005), who find evidence for significant absolute convergence in the case of the EU-9 (Belgium, Denmark, France, Germany, Italy, Ireland, Luxembourg, the Netherlands, and the UK) over the period 1985-1998, as well as by Geppert, Happich and Stephan (2005), who demonstrate an increase of convergence for the EU-15 between 1986 and 2000.

Martin (1999) presents four models covering the period 1980-1994. The absolute convergence approach used leads to the finding that there is increasing convergence in Objective 1 regions, but decreasing convergence in the rest of the 145 European regions under study. The same is confirmed if country specific dummy variables are introduced in the model. These findings raise the issue of the role played by the individual-invariant factors of regions in their growth processes.

Acknowledging this, several authors test convergence regression models that include individual-invariant characteristics. Yin, Zestos and Michelis (2003) find a

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higher rate of convergence when including conditioning variables (e.g. economic explanatory variables or socio-political ones). Eckey, Döring and Türck (2006) already include the new EU member states in their sample, using country groups as dummies. They find indications of divergence for the period 1995-2003, but the results are limited by the spatial correlation identified by the authors.

Convergence is often examined using a panel data approach, the advantage of which is that the model also incorporates individual regional effects. Cuadrado-Roura (2001), for instance, concludes that compared to the period 1977-1986, absolute convergence of European regions decreased between 1986 and 1994, but conditional convergence increased. In trying to account for spatial dependence in a dynamic panel data model, Badinger, Müller and Tondl (2004) propose a two-step approach: first they filter the data to remove the spatial correlation, and then use standard GMM estimators to estimate convergence in the case of 196 European NUTS-2 regions for the period between 1985 and 1999. In this way, the authors estimate a convergence rate of 6.9 per cent as opposed to the much higher convergence rates identified by earlier panel data studies.

Several other researchers try to estimate the rate of β-convergence taking into account spatial effects. For instance, using an OLS-model with a spatial error term, Baumont, Erthur and Le Gallo (2003) find a quite low convergence rate (1.2 per cent) for the EU-12 over the period 1980-1995. Bräuninger and Niebuhr (2005) demonstrate an even lower convergence rate (below 1 per cent) for the EU-15 over the period 1980-2002 in a spatial lag and a spatial error model.

σ-convergence, the other concept of Barro and Sala-i-Martin (2004), occurs when the differences of per capita income among regions decrease in absolute terms. The existence of σ-convergence supposes the existence of *ß-convergence*, but the latter

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is not sufficient for σ-convergence to occur. Research focusing on σ-convergence has yielded contradictory results. While Tondl (2001), for instance, finds no evidence for σ-convergence in the case of the EU-9 for the period 1975-1994, Yin, Zestos and Michelis (2003) identify σ-convergence for several groups of EU member states in the period 1960-1995. True, in the case of the EU-6 σ-convergence is demonstrated only for the period between 1960 and 1979; however, with the inclusion of Denmark, Ireland and the UK in the sample (the EU-9), σ-convergence is proved for the entire period. The same is demonstrated for the EU-12 and EU-15, respectively). Studying the EU-15 in the period 1975-2000, Barrios and Strobl (2005) identify only slight changes in the standard deviation. Similarly, Basile, de Nardis, and Girardi (2005) find no evidence of σ-convergence for the EU-12 over the period 1975-1998.

In addition to the standard deviation of per capita GDP or GVA, the coefficient of variation of panel data is also used to evaluate the dispersion of per capita income among regions. In this case, σ-convergence is proved if the coefficient of variation falls over time.

Models of *convergence clubs* or *convergence clusters* seek to reconcile the unconditional and conditional convergence hypotheses by assuming that regions with similar initial individual-invariant characteristics tend to converge to the same steady state. Thus, while differences of per capita income might not decrease among regions with different individual-invariant characteristics, they are expected to decrease among regions with similar characteristics.

Some authors identify convergence clubs using spatial econometric methods. Baumont, Ertur and Le Gallo (2003), for instance, distinguish between two spatial convergence clubs, namely the North-European countries and the Mediterranean ones, and find absolute β-convergence only in the case of the latter. Similarly, Le Gallo and

Dall'erba (2006), who divide EU regions into core and peripheral ones, can demonstrate convergence only for the peripheral regions for the period 1980-1999. If the new member states from CEE are also included in the sample, the results tend to show a West-East polarization instead of the classical North-South polarization. Ertur and Koch (2006) distinguish between the cluster of poor regions including almost all Eastern European regions and the cluster of rich regions in Northern and Western Europe. Fischer and Stirbock (2006) also identify two clusters, the first including most EU-15 regions without some regions of Greece, Italy, Portugal and Spain, and the second, the poor cluster consisting of Eastern and South European regions. Using the spatial error model, the authors prove a convergence rate of 1.6 per cent for the first cluster and 2.4 per cent for the second cluster.

According to some researchers (e.g. Cuadrado-Roura 2001, Niebuhr and Stiller 2004), the national effect still plays an important role in the development of regions within the EU. More precisely, regions from a given country are more tightly linked than regions from different countries, which can lead to convergence clubs of national states.

As a sum up, we can say that the majority of the studies dealing with convergence in the European Union find a low convergence rate of all or some regions, regional disparities still persisting. Another conclusion that we can draw is that there are only a limited number of studies focusing on the EU-25, and even fewer that would also include Bulgaria and Romania in the sample of countries under examination. This is easy to understand in the light of the fact that the latest rounds of EU enlargement took place recently, in May 2004 and January 2007, but at the same time it also provides a good rationale for retesting the convergence hypotheses in the present context.

2.6 Summary

As we have seen in this chapter, the discussion of the impact of institutions and policy choices on economic growth links together different streams of literatures dedicated to explaining growth performance differentials in various national contexts.

After reviewing the main theoretical debates related to the role of institutions in generating and sustaining steady economic growth it is evident that promoting the integration of the economic areas of the CEE-10 countries in the EU builds on the neo-classical growth literature. Thus, in terms of political and societal expectations the success of European integration and of the implementation of regional policy measures is assessed by the extent to which disparities among the different regions of the EU decrease over time. Therefore, the issue of economic convergence is in the center of attention in economic policy-making and not only. Policies have been created at the EU level and significant funds allocated through the European regional policy for the assistance of poorer regions and economies in catching up with wealthier ones.

However, given that the majority of the studies dealing with convergence in the European Union find a low convergence rate of all or some regions and conclude that regional disparities still persist, it is only natural that the efficiency of these funds in reducing income differences across regions and the approaches adopted for allocating them receive much criticism and have sparked considerable debate. This renewed attention towards the relationship between institutions and growth processes is understandable taking into consideration that, as we have seen in this chapter, the views on the sources of growth and the predictions about convergence/divergence are rather contradictory in both theory and empirical investigations.

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All the above draw attention to the need to more rigorously evaluate the extent to which the adopted cohesion policies might or might not produce the expected societal results, since both the classical regional growth theories and the new interpretations have been applied to the evaluation of regional growth prospects in the larger EU with limited success only. Another conclusion that can be drawn is that there are only a limited number of convergence studies focusing on the new member states.

Chapter 3. Research Methodology

3.1 Introduction

In this chapter, I present the research model and methodology adopted in the dissertation. The theoretical expectation related to income convergence relies on the Solow-Swan model, which predicts that countries that have similar technological parameters, preferences and policy making structure and are different only in their initial per capita GDP level will converge, as poorer economic units will have higher growth rates. The convergence tests proposed are considered to be useful instruments to discriminate among growth theories. Thus, if both growth and income convergence are found to be present at the same time, the assumption of the neo-classical growth models is confirmed. While if divergence is observed, the predictions of the endogenous growth theory (i.e. the higher the initial level of income, the higher the growth rate) might prevail.

This chapter is covers the research hypotheses corresponding to the research questions put forward in the introductory chapter. Under each research hypothesis I present the methods to be used for verification and mention the data source. Then a more detailed presentation of the data sources used in the dissertation follows.

3.2 Research hypotheses and methods of verification

H1. <u>The hypothesis of macro-economic reforms leading to growth</u>

As seen in the literature review chapter, although democratization processes are positively associated with reduced growth rate volatilities, they are not sufficient to induce and sustain high growth rates. Policy reforms are essential to eliminate distortions and imperfections that emerge both in the operations of markets and in the operations of the public sector. In this line, in the case of the CEE-10 countries reforming macro-economic policy-making may be a fundamental instrument to induce growth. Therefore, my first hypothesis is that the larger the scale of macro-economic policy reforms, the higher the expected per capita GDP growth rate of the country.

In order to verify this hypothesis, single equation ordinary least square regression analysis is applied including the ten CEE countries over a fifteen-year period. To assess the possible link between the year of reform and growth performance, three sub-periods will also be tested. I use the dataset collected by the European Bank for Reconstruction and Development (EBRD), since at the moment this seems to be the only authoritative one that is both comparative and refers to the reform period in the countries under study.

The EBRD data cover the progress of privatization, enterprise restructuring, price liberalization, trade openness, competition policy, banking reform and interest rate liberalization, and overall infrastructure reform. The methodology developed by the EBRD is to assess the progress of policy reforms during transition by measuring it to a common benchmark, namely the standard practice in industrialized market economies. The data are reported as scale level measures ranging from a minimum value of 1, representing limited policy change from a centrally planned economy, to 4+, which corresponds to the standards applied in industrialized market economies.

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H2. <u>The hypothesis of limited EU influence over regionalization in the CEE-10</u>

Despite consensus in the Europeanization literature on the importance of the different accession criteria and specific conditionalities in the field of regional policy, the acquis communautaire is limited in scope, which seems to have offered accession countries substantial leverage over the extent of territorial reform. This raises the question whether territorial reforms in the CEE-10 countries have been carried out in accordance with the expectations of the European Commission. I hypothesize that the EU conditionality in the field of regional policy only limitedly influenced territorial reform in the CEE-10 countries. If it is verified that the CEE-10 avoided undertaking substantial reforms in the field of regional policy, this could have important longer term consequences on the growth performance of sub-national regions. The testing of this hypothesis will be carried out using qualitative methods of document analysis, including legal documents regulating the powers and responsibilities of sub-national units at the levels of the cohesion region (NUTS-2) and the highest local authority (NUTS-3).

H3. <u>The hypothesis of unconditional β-convergence across the CEE-10</u>

An empirically and also theoretically important question regards the extent to which the fundamental institutional and policy reforms adopted in the CEE-10 countries eliminated the differences in steady state levels. The relevance of the topic emerges from the important per capita GDP income differences among the CEE-10 countries. Building on the method of convergence testing, if all macro-level differences eliminated and countries differ only in their initial level of per capita GDP income, then the expectation is that lower income countries and regions would grow at higher rates.

To verify this hypothesis, pooled regression estimates using OLS are used and by assuming homogeneous intercept and slope coefficients, the supposition of regions converging to the same steady state is operated. The analysis is carried out at national, NUTS-2 and NUTS-3 levels for the whole period and three sub-periods. The data source is the New Cronos dataset of Eurostat with comparable data on GDP per capita in PPS.

H4. The hypothesis of conditional β-convergence across the CEE-10

Even if significantly similar institutional and policy reforms were adopted in the CEE-10 countries, the assumption of all differences being eliminated is likely to prove to be too strong and thus the estimations of the pooled OLS regression to produce biased results. To avoid such a situation it is important to control for country specific differences (fixed-effects) to capture the different individual-invariant characteristics of regions by introducing proxies or dummy variables. In this way unobserved country specific effects become the coefficient of the region-specific dummy variables and using the least square dummy variable approach the intercepts of regions are allowed to vary across countries. In an attempt to avoid possible multicolinearity problems by using dummy variables, a second model will also be estimated by imposing the restriction of the sum of all dummy parameters to be equal to zero, where the coefficient captures the distance from the average country group effect.

In this modeling context, the expectation is that after controlling for country fixed effects, both in the case of NUTS-2 and NUTS-3 levels, regions with lower per capita GDP income at the beginning of the period under analysis will exhibit a higher grow rate compared to regions with higher per capita GDP income. Again, the data used for the verification of this hypothesis is from the New Cronos dataset of Eurostat.

H5. <u>The hypothesis of σ-convergence across the CEE-10</u>

To assess the extent to which σ-convergence is observable, I adopt the coefficient of variation approach, which is calculated by dividing the time-series standard deviation by the sample mean of the cross-section and multiplying it by one hundred. This will provide a test to the claim in the literature according to which β-convergence is a pre-requisite for the presence of σ-convergence. Thus, if neither unconditional, nor conditional convergence identified, the expectation is that no σ-convergence will be present. This will be tested both at national and sub-national (NUTS-3) levels for the sample of the CEE-10 countries, using data from the WIIW Countries in Transition 2006.

H6. <u>The regression fallacy and the parameter heterogeneity hypothesis</u>

The literature on convergence tests uses ordinary least square as the main instrument of analysis. Yet, this method is known for its strong assumptions related to linearity, normality, homoscedasticity, independence and model specification. Furthermore, estimation results are also vulnerable to variables transformations and influential data, which raise the issue of the validity of estimates. For this reason, in this dissertation comprehensive regression diagnostics are carried out to verify whether this commonly used method can be validly used for the case of the CEE-10 country sample at all three levels of analysis and varying time periods.

The least-absolute value model approach is proposed as an alternative method of analysis to possibly correct for biased estimation results. This approach has the advantage of using the quantile regression model that uses the conditional median function of the defined groups instead of the unconditional mean, which allows for

assessing whether there are any growth performance differences among groups of regions with different initial per capita income levels. The prediction results of both methods are compared and empirical and theoretical conclusions are derived

3.3 Sources of data

The empirical analysis of the dissertation builds on data extracted from the New Cronos dataset of Eurostat, consisting of comparable data on GDP per capita measured in PPS, which allows internally consistent between- and within-country comparisons. These data are complemented by the European Bank for Reconstruction and Development (EBRD) Transition Report database and WIIW Countries in Transition 2006 dataset.

The New Cronos dataset includes, among others, information on the 190 NUTS-3 level regions, the 53 NUTS-2, the 18 NUTS-1, and the ten Central and Eastern European countries that acceded to the European Union in the years 2004 and 2007. The full list of regions included in the sample is presented in table 36, at all four levels of aggregations. The data in this dataset are annual observations and refer to the 1995-2003 period for all variables. Due to methodology changes or missing data, the dataset does not include observations on all variables and in all moments in time, which implies that the panel is unbalanced.

To ensure internal consistency of the time-series, the indicator selection to verify the convergence hypotheses had to take into account the important shocks that institutions in the selected countries underwent during the 1990s. The redefinition of almost all institutions raise, among others, issues related to data reliability and time-trend inconsistencies due to methodological changes in indicator compositions. As a result, the analysis starts from 1995, year by which the most institutional reforms had

been carried out (for instance, new constitutions had been adopted, multi-party systems set up, free and fair elections organized, and economic reforms designed and largely implemented).

Since gross value added data were time-inconsistent with several breaks in the series (largely due to the fact that the methodology of calculation had to be aligned to European standards), which makes cross-sectional comparisons inconsistent, gross value added was replaced by consistent gross domestic product data. Nevertheless, in order to ensure cross-sectional comparability, I adopted GDP per capita expressed in purchasing parity standard (PPS) in EURO. One weakness of the data is that PPS is not region specific but country specific, which implies that within-country price variations are assumed away. Nevertheless, by adopting GDP per capita in PPS, the data are internally consistent both from time-series and from cross-sectional perspectives.

To assess the extent of policy reform in the countries under study, I used the sophisticated methodology called Transition Indicators, developed by the EBRD, and published in its annual *Transition Reports*. This methodology ensures comparability both in the cross-section and the time-series. Transition indicators were grouped by the EBRD in: overall transition indicators, financial sector transition indicators, industry and commerce transition indicators, and infrastructure transition indicators.

The data from the WIIW Countries in Transition 2006, which cover the period 1990-2005, were used to calculate national level σ-convergence processes.

The different variables used in this dissertation paper include:

- Annual GDP per capita, for which data are available for the period 1995-2003 at all four levels of aggregation. As already mentioned, these data are from the New Cronos database maintained by Eurostat and are

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methodology-consistent. Throughout the analysis I use the log of GDP per capita in PPS.

- Per capita income growth rate, which was calculated by taking the log of GDP for the last year divided by the initial year of the period.

- Reform indicators (overall transition indicators and infrastructure reform indicators) are from the EBRD *Transition Report*. These data are annual and are available at national level only.

- Population density, measured as 1000 inhabitants per km^2, for which data are available for the full period with missing values for three levels of aggregation, yet we have data for all regions. To enhance the quality of data, I use the mean population density indicator for the period 1995-2004, which allows grouping the units of analysis in clusters.

The panel is unbalanced, as for some levels of analysis a number of data are not available. Thus, the panel does not have data on all four levels of analysis in the case of Romania for the period 1995-1997, on the NUTS-3 level for Hungary for the year 2000, and on the NUTS-3 level for Warszawski, Miasto Warszawa, Czestochowski, Bielsko-Bialski, Centralny Slaski, Rybnicko-Jastrzebski in the case of Poland for the period 1995-1999.

In the estimation process a series of dummies were used, more precisely:

- Ten country dummies for each country to capture the political and macro-economic context in which counties (NUTS-3) are analyzed.

- Fifty-five development/ planning regions dummies were created to evaluate within-country variation.

- Various year dummies were used to assess lag effects.

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The statistical analysis was carried out using STATA 9, and the full dataset is available upon request, the most important statistics are also included in the Appendices. The basic STATA package was with the following ado files:

- *grqreg* graphs the coefficient of a quantile regression and was developed by Joao Pedro Azevedo.

- *hilo* displays highest and lowest values of a given variable. Ado file developed by Michael N. Mitchell.

- *listcoef* is a command that lists the regression coefficients. By J. Scott Long and Jeremy Freese.

3.4 Summary

This chapter formulated the research hypotheses corresponding to the research questions put forward in the introductory chapter of the dissertation, presenting the data source and the methods of verification for each. The next chapters are dedicated to the testing of the hypotheses. The hypothesis of macro-economic reforms leading to growth will be verified in chapter four, the hypothesis of limited EU influence over regionalization in the CEE-10 countries will be tested in chapters five and six, while the remaining four hypotheses will be verified in chapter seven, which is the main statistical, quantitative chapter of the dissertation.

Chapter 4. Policy Reforms and Economic Performance

4.1 Introduction

This chapter serves the purpose of presenting the political and economic context in which regionalization processes took place in the CEE-10 countries prior to their EU accession. The analysis starts with the year 1990, the moment when the CEE-10 countries decided to join the European Community. Back then there were two major division lines between the EC and CEE-10 countries, which related on the one hand to democratic rule and the regulating of markets, and on the other hand to the economic backwardness of the CEE-10 region.

The first division line could be defined in institutional and policy terms, referring to differences between the EU-15 and the CEE-10 countries in terms of democratic rule and economic policy systems. While in the year 1990 the EU-15 countries had for long been democratic, the CEE-10 countries were only at an early stage of democratization and transition. In the latter countries the first democratic elections were held only in 1989-1990, with major tasks ahead to create a new social order under a democratic constitutional system. Furthermore, while Western democracies were competitive and open markets, the CEE-10 countries were over-regulated, uncompetitive, mismanaged and closed markets.

The second division line could be referred to as the legacy of economic backwardness of the CEE countries compared to their Western counterparts.

Historically, the CEE-10 countries were the lagging corner of Europe in terms of economic performance. The existing gap significantly deepened following World War II, which was mainly attributable to the opposing political and economic developmental pathways that the two regions undertook.

Given these two major division lines, the CEE-10 countries were faced with the challenging task of bridging or at least reducing the existing gaps between their region and the EC. In this chapter first I discuss the macro-economic reforms carried out, namely the privatization of state owned enterprises, the restructuring of enterprises, trade and price liberalization, the reform of competition policy, banking reform, and overall infrastructure reform. Then I go on to analyze the evolution of the economic performance in the CEE-10 region. In the last section, I evaluate the relationship between macro-economic reforms and growth, verifying my first research question.

4.2 Macro-economic policy reforms

Mounting macro-economic instability was one of the central sources of the economic collapse of socialist regimes in the CEE-10 countries. To move out of autarky, the CEE-10 countries had to carry out sustained reforms leading to deregulation, privatization, price liberalization and the creation of the rules for the emergence of an open and competitive market. These policy reforms needed to be implemented in a general atmosphere of limited social security, increasing social inequality and significant levels of poverty. Despite the different strategies adopted (i.e. shock therapy vs. gradualism) and numerous challenges in the implementation of often unpopular reform measures, by the year 2004 all CEE countries succeeded in improving their political, institutional and policy context to an extent that they could be declared

democracies and open and competitive market economies. Thus, the question is not whether or not these countries carried out these reforms, but much rather to what extent and when exactly they did so.

Assessing the scale of policy reforms in the CEE-10 countries in a cross-country comparative framework requires the adoption of a common assessment methodology that is applied regularly to evaluate change in the quality of the policy-making process. Such assessment is qualitative in nature, and therefore vulnerable to interpretation bias. Despite these possible pitfalls, the task is worth undertaking when trying to analyze the impact of policy reform quality on growth performance.

Therefore, in what follows I will discuss each major policy field separately. As already mentioned in the section on data sources, I use the dataset compiled by the EBRD, where the annual progress of the policy reforms is measured to a common benchmark, namely the standard practice in industrialized market economies. For each policy field I present the descriptive statistics in a separate table covering all the CEE-10 countries in the period 1990-2006, also indicating the minimum and maximum scores for each country.

4.2.1 Privatization of state owned enterprises

One response to the major macro-economic pressures that the CEE-10 countries had to deal with during societal transformation, e.g. the increasing need for industrial restructuring to correct output fall, was to implement mass privatization of state owned enterprises. From the early stages of transformation privatization of state owned enterprises was considered of central importance for the success of the CEE-10 countries to move from planned towards market economy.

Several major arguments supported mass privatization of state owned enterprises in the newly emerging democracies of the CEE-10 countries in the early 1990s (Kozarzewski and Rakova, 2005). Perhaps the most pervasive argument to carry out wide scale privatization was that state ownership of production capacities was the principal source of economic inefficiency during socialist times and after the regime change state owned monopolies systematically underperformed in comparison with private companies working in a competitive market, their corporate governance being plagued by corruption and the lack or limited control over decisions by stakeholders.

Another pervasive idea in favor of privatization was related to wage restraint, which is much stronger in the private sector than in the public sector. Thus, privatization was seen to reduce the inflationary pressures resulting from wage increases in the state owned public companies. Privatization was also considered to allow the reduction of state subsidies to non-competitive production units. Last but not least, privatization proceeds proved to be important sources of much needed revenue for governments during the transformation period, helping to balance fiscal deficits, which was critical for maintaining the system's cohesion.

Despite the above arguments, there were others which strongly opposed wide scale privatization plans. For instance, it was argued that the impact of mass privatization on the labor force would be unemployment, the activity rate differentials between male and female would increase, and social divisions would deepen.

Implementing privatization plans was often halted in the CEE-10 countries by the political opposition, which was supported by masses, the "victims" of reforms who rallied in impressive numbers on the streets of capital cities and not only. The relative power of reformers in the early transition governments influenced the speed and depth of privatization to a large extent.

From table 1 we can see that although at the beginning of the period most assets were publicly owned, the large scale privatizations that were carried out led to a drastic decrease of state company ownership by the end of the transition period. The frontrunners, e.g. the Czech Republic, Estonia and Hungary, carried out the major privatizations by 1995. In contrast, Latvia, Slovenia and Poland were much more moderate in privatizing state owned enterprises. Slovakia implemented privatizations after the cabinet change and the major reforms in the second part of the 1990s. There is also the group of countries which adopted a much more gradual approach to privatization, namely Bulgaria, Lithuania and Romania. Nevertheless, even if these countries often applied the voucher method of mass-privatization or privatized in several consecutive waves, the revenues produced were similarly large as in the case of early privatizers.

Table 1. Privatization in the CEE-10 countries

Period 1990-2006

	Mean	St. dev.	Co. var.	Min	Max
Bulgaria	2.785294	1.054183	0.38	1	4
The Czech Republic	3.470588	1.06757	0.31	1	4
Estonia	3.294118	1.212678	0.37	1	4
Hungary	3.529412	0.799816	0.23	2	4
Latvia	2.961176	0.881404	0.30	1	4
Lithuania	2.706471	0.881752	0.33	1	3.67
Poland	2.958823	0.562371	0.19	2	3.33
Romania	2.648235	0.811759	0.31	1	3.67
Slovakia	2.490588	0.782875	0.31	1	3
Slovenia	3.294118	1.046704	0.32	1	4

Source: EBRD Transition Report, coefficient of variation being own calculations

Although the privatization of state owned enterprises varied in scale and timing across the CEE-10, comprehensive programs were implemented in all these countries, with major state monopolies being dismantled and ownership by private actors

increasingly replacing former public ownership. The privatization of state owned enterprises has been praised by many for its role in this process of clearing markets and strengthening private entrepreneurship. Furthermore, as already pointed out, it can be considered as a major source of financing for the public sector, since it provided important revenues for sustaining further reforms.

4.2.2 Enterprise restructuring

To ensure that the privatization of state owned enterprises and the emergence of private ownership would lead to the realization of the supposed efficiency gains both at enterprise and societal level, further institutional reforms needed to be implemented. The primary and secondary institutional and legislative framework had to be developed in order to improve the environment in which both publicly and privately owned enterprises operated. For instance, financial discipline at the level of newly privatized or created companies in the CEE countries needed to be strengthened by eliminating soft-budgets from the economy, keeping various government subsidies at minimum level and giving banking credits on performance basis. Failing to adopt these measures influences the number of companies opened in an economy (Beck et al., 2002) and the cost of investment capital (Dyck and Zingales, 2004).

The data from table 2 indicate that – compared to the mass privatization carried out in the CEE countries – the advancement of enterprise restructuring was considerably of smaller scale and often implemented with much delay. Even in the case of the best performing countries (i.e. Estonia, Hungary, Poland and Slovenia) enterprise restructuring was limited due to deficiencies in the legislation related to corporate governance or the limited enforcement of this legislation. The main problematic areas were the insolvency laws, the regular bailing out practices of state

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owned enterprises through debt relief and the weak administrative capacity of competition (anti-monopoly) offices to enforce corporate governance laws and sanction violations.

In the case of all the ten countries, but mainly Bulgaria and Romania the limited success in developing sound corporate governance and carrying out enterprise restructuring to its full extent can be also linked to persisting institutional distortions in the business environment and limitations in the enforcement of competition regulation. As Claessens (2003) points out, the quality of corporate governance in a country influences its success in attracting foreign capital. This partly explains why FDI was concentrated in the early reformer countries and why latecomers could start to catch up only following the implementation of similar reforms.

Table 2. Enterprise reform in the CEE-10 countries

Period 1990-2006

	Mean	St. dev.	Co. var.	Min	Max
Bulgaria	2.035294	0.636338	0.31	1	2.7
The Czech Republic	2.888235	0.633327	0.22	1	3.3
Estonia	2.858824	0.790616	0.28	1	3.7
Hungary	3.029412	0.642033	0.21	1	3.7
Latvia	2.382353	0.748528	0.31	1	3
Lithuania	2.423529	0.656248	0.27	1	3
Poland	2.976471	0.520252	0.17	2	3.7
Romania	1.882353	0.457213	0.24	1	2.7
Slovakia	2.447059	0.729827	0.30	1	3
Slovenia	2.864706	0.667028	0.23	1	3.7

Source: EBRD Transition Report, coefficient of variation being own calculations

The limited scale of enterprise restructuring indicates that further reforms are required to sustain the articulation of good business governance in the CEE countries. Delaying the adoption or enforcement of business governance legislation is partly

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attributable to the weak administrative capacity of the relevant institutions and to the limited capital at the disposal of reformers for the full implementation of their programs. Nevertheless, by postponing the deepening of fundamental reforms the national governments deprive the economies of the CEE region of critically important FDI, which is thus directed to other locations.

4.2.3 Price liberalization

Price liberalization was among the main structural reform instruments used in the CEE-10 countries to ensure macro-economic stabilization. According to the data of the EBRD, presented in table 3, a similar level of price liberalization as that in Western economies was achieved in Hungary as early as 1991, in Estonia and Latvia in 1993, in the Czech Republic in 1997, in Poland and Romania in 1998, while in Slovakia and Lithuania only in 2002. Surprisingly, Slovenia, one of the leading economies in the region, is considered by EBRD experts not to have fully liberalized prices until 2006.

Table 3. Price liberalization in the CEE-10 countries

Period 1990-2006

	Mean	St. dev.	Co. var.	Min	Max
Bulgaria	3.829412	0.890762	0.23	1	4.3
The Czech Republic	4	0.786607	0.20	1	4.3
Estonia	3.994118	0.685994	0.17	2.3	4.3
Hungary	4.282353	0.072761	0.02	4	4.3
Latvia	3.835294	0.625441	0.16	2.3	4.3
Lithuania	3.994118	0.864198	0.22	1	4.3
Poland	4.12353	0.213686	0.05	3.7	4.3
Romania	3.811765	0.890142	0.23	1	4.3
Slovakia	3.858824	0.154349	0.04	3.7	4
Slovenia	3.911765	0.763121	0.20	1	4.3

Source: EBRD Transition Report, coefficient of variation being own calculations

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4.2.4 Trade liberalization

Along with price liberalization, trade liberalization was one of the top macro-stabilization strategies of the CEE-10 countries, especially because of their objective to join the European Union. Free trade was adopted in the very early years of transition in all these countries, with protective measures usually retained in the case of the sectors where public ownership of companies was significant or those of special interest (e.g. the energy sector). Thus, instead of continuing with import-substitution policies, liberalization became central for the improvement of economic performance (Krueger, 1997; Wacziarg and Welch, 2003). National markets open to international trade benefit from the competitive pressures and thus strengthen internal competition (leading to the drop of consumer prices) and improve the economic efficiency of domestic producers (allow access to cheaper production materials).

Table 4. Trade liberalization in the CEE-10 countries

Period 1990-2006

	Mean	St. dev.	Co. var.	Min	Max
Bulgaria	3.847059	0.676496	0.18	2	4.3
The Czech Republic	3.958824	0.827692	0.21	1	4.3
Estonia	3.711765	0.942657	0.25	1	4.3
Hungary	4.170588	0.323583	0.08	3	4.3
Latvia	3.576471	1.131663	0.32	1	4.3
Lithuania	3.611765	1.149936	0.32	1	4.3
Poland	4.017647	0.499043	0.12	3	4.3
Romania	3.629412	1.103271	0.30	1	4.3
Slovakia	3.958824	0.659601	0.17	2	4.3
Slovenia	3.941177	0.823149	0.21	1	4.3

Source: EBRD Transition Report, coefficient of variation being own calculations

The special attention given to trade liberalization by the CEE-10 countries was mainly due to the perspective of EU pre-accession negotiations, which set the lowering

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of the barriers with the EU-15 as a condition of the accession process. However – as Rodriguez and Rodrik (2000) conclude in a review of the empirical literature on trade liberalization and economic growth – trade liberalization in itself, without being backed by comprehensive development strategies, is not a sufficient instrument to induce growth.

4.2.5 Competition policy reform

Developing regulations for the elimination of restrictions in the competition of companies in the CEE-10 countries was central to avoid the reoccurrence of systematic market failure and to create prospects for the emergence of healthy corporate governance. The reform of the competition policy was part of the wider market policy reforms in the CEE-10 countries. Following the mass privatization of state owned companies, the small economies of the CEE-10 increasingly faced the challenge of exposure to international economic trends and ownership concentration by large international corporations, which could hinder the development of domestic corporate governance to take advantage of the business opportunities created by trade and price liberalization. As a result, an articulated competition policy needed to be put in place. This was a complex task, since – as Gal (2004) states – competition policy reform should be part of the regulatory reforms in all sectors of the economy (i.e. the judiciary, the legislative and other institutions should be involved in the implementation of competition regulation). The measures that needed to be adopted include, among others, the setting up of new property rights regulations and the building of the capacities necessary for their enforcement.

The data presented in table 5 show that – despite some progress – the reform results in the field of competition policy remained modest. This points to possible structural weaknesses in the functioning of markets and the operation of corporations.

Table 5. Competition policy in the CEE-10 countries

Period 1990-2006

	Mean	St. dev.	Co. var.	Min	Max
Bulgaria	2.164706	0.374068	0.17	1	2.7
The Czech Republic	2.676471	0.540289	0.20	1	3
Estonia	2.335294	0.841829	0.36	1	3.7
Hungary	2.758824	0.626557	0.23	1	3.3
Latvia	2.305882	0.772553	0.34	1	3.3
Lithuania	2.188235	0.554394	0.25	1	3
Poland	2.805882	0.391265	0.14	2	3
Romania	1.788235	0.686369	0.38	1	2.7
Slovakia	2.147059	0.624618	0.29	1	2.7
Slovenia	2.758824	0.626557	0.23	1	3.3

Source: EBRD Transition Report, coefficient of variation being own calculations

However, the imperfections of the markets as a result of under-regulation and/ or limited implementation of various provisions related to property rights, entry costs and other dimensions of competition among economic actors are likely to influence growth prospects.

4.2.6 Banking reform and interest rate liberalization

In the field of banking the reform was more gradual and smaller in scale compared to price liberalization.   As table 6 shows, at the beginning of the period Poland was the only country with a slightly advanced banking reform, the situation remaining far from satisfactory also at the end of the period, when the CEE-10 countries were still at a considerable distance from the enrooting of fully competitive banking systems.

Table 6. Banking reform and interest rate liberalization in the CEE-10 countries

Period 1990-2006

	Mean	St. dev.	Co. var.	Min	Max
Bulgaria	2.558824	0.876826	0.34	1	3.7
The Czech Republic	3.141176	0.741669	0.24	1	4
Estonia	3.123529	0.947714	0.30	1	4
Hungary	3.352941	0.931476	0.28	1	4
Latvia	2.647059	0.902855	0.34	1	3.7
Lithuania	2.852941	0.875441	0.31	1	3.7
Poland	3.029412	0.535916	0.18	2	3.7
Romania	2.323529	0.800414	0.34	1	3
Slovakia	2.847059	0.763313	0.27	1	3.3
Slovenia	2.858824	0.667138	0.23	1	3.7

Source: EBRD Transition Report, coefficient of variation being own calculations

Hungary represents a notable exception as major reforms were implemented by 1997, while Estonia achieved a similar extent of reforms only by the year 2004 and the Czech Republic by 2005. At the other end there is Romania, which registered a backlash in 1997 and 1998 and was able to recover only to a limited extent, having the least reformed banking sector among the CEE-10 countries.

4.2.7 Overall infrastructure reform

The EBRD data indicate major limitations in what concerns the reform of the overall infrastructure policy in the CEE-10. The index includes assessments about the delivery systems of the following services: telephone, railroad, electric power, road, water and waste water.

As table 7 shows, public infrastructure delivery systems significantly improved over the period 1990-2006, following important reforms in the ways of deciding over policy priorities. The table also indicates that despite a similar context at the beginning

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of the reform period, important differences can be observed by the end of the period in both the path and the completion of the policy reform process.

The figures indicate that in none of the countries under study can we consider policy related rigidities completely eliminated, except maybe in Hungary, which achieved a score of 3.67. The country that seems to have carried out infrastructure policy reform to the smallest extent is Lithuania, with a score of 3 achieved only in the year 2006. The other countries seem to have succeeded in eliminating the severe distortions, but have retained some country specific distortions in various dimensions of infrastructure provision.

Table 7. Overall infrastructure reforms in the CEE-10 countries

Period 1990-2006

	Mean	St. dev.	Co. var.	Min	Max
Bulgaria	2.117647	0.840562	0.40	1	3
The Czech Republic	2.523529	0.747102	0.30	1	3.33
Estonia	2.682353	0.65882	0.25	1.3	3.33
Hungary	3.088235	0.743205	0.24	1.3	3.67
Latvia	2.047059	0.760853	0.37	1	3
Lithuania	2.276471	0.804308	0.35	1	3
Poland	2.735294	0.602019	0.22	1.7	3.33
Romania	2.117647	1.027883	0.49	1	3.33
Slovakia	2.305882	0.695046	0.30	1	3
Slovenia	1.929412	0.784829	0.41	1	3

Source: EBRD Transition Report, coefficient of variation being own calculations

Following the discussion on the scale of the reforms undertaken in the key policy fields, I will now go on to assess the different strategies adopted by the CEE-10 countries in terms of the timing of reforms since 1990. This is also an important indicator for the general macro-economic framework in which regionalization was undertaken later on. To present the differences in the timing of the reforms across the

CEE-10, I use the coefficient of variation of the annual reform scores achieved by individual countries.

The results for the seven fields are presented in figure 1. The scatter-plots in the figure indicate that the initially high differences in reform scores faded away by the year 2000, with the exception of overall infrastructure policy, where differences also show a decreasing trend, but still remain relatively high compared to the other fields. Besides, this is the field in which the advancement of the reform was the slowest of all.

The sudden high increase of the coefficient of variation followed by a relatively smoother decrease across the countries under study suggests that rather dissimilar policy strategies were adopted for the elimination of the government imposed distortion effects during the reform period. A somewhat different picture can only be observed in the fields of trade and price liberalization, where the disparity levels among the countries in terms of policy-making quality were low already at the beginning of the period, in the year 1990, as most of them considered the implementation of wide scale liberalization a high priority. In contrast, in the fields of enterprise restructuring, competition policy and infrastructure policy only limited success was registered in the implementation of full-scale reforms.

The above suggest that although the reforms of the major macro-stabilization related policies were not fully carried out, an increasing common understanding of how to deliver these services seems to be emerging throughout the CEE-10 countries. This can be interpreted as policy convergence with the EU-15 (full convergence in the case of trade and price liberalization and partial convergence in the case of the other policy fields).

Figure 1. Macro-policy reforms in the CEE-10 countries, period 1990-2005
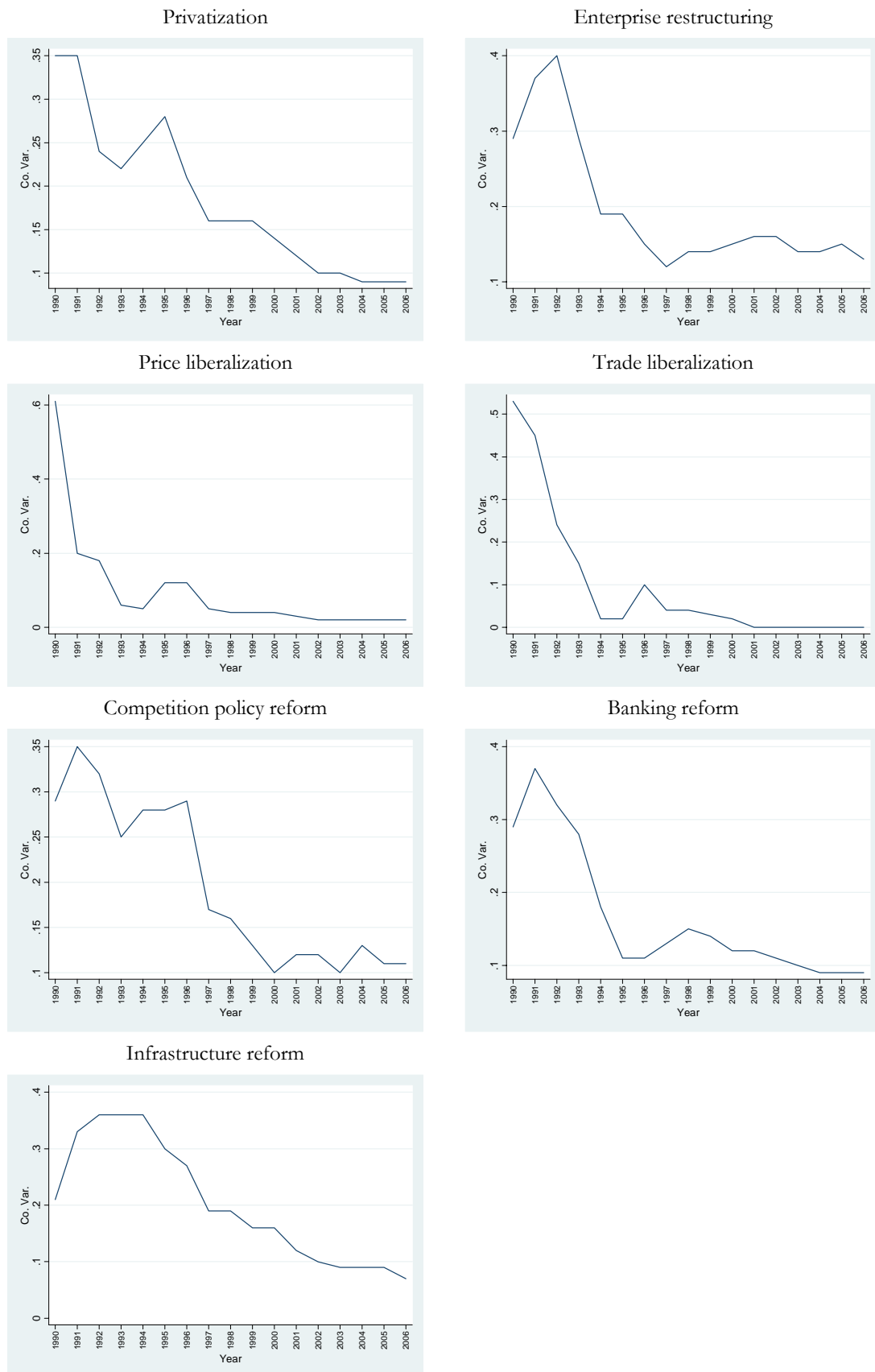
Source: EBRD Transition Report, coefficient of variation being own calculations

From the perspective of the dissertation the finding that government imposed rigidities remained considerable across the CEE-10 even despite the conditionalities set by the EU during accession negotiations is important because these rigidities are likely to have a negative impact on the growth performance of each country.

4.3 Economic performance of the CEE-10 countries

When studying the economic performance of the CEE-10 countries we have to take into consideration that they are all small economies (Bara and Csaba, 2000: 397). Despite their initial economic backwardness, significant growth rates in terms of per capita GDP income expressed in PPS were registered in each of the CEE-10 countries over the period under study.

Figure 2. The evolution of per capita GDP in the CEE-10 countries
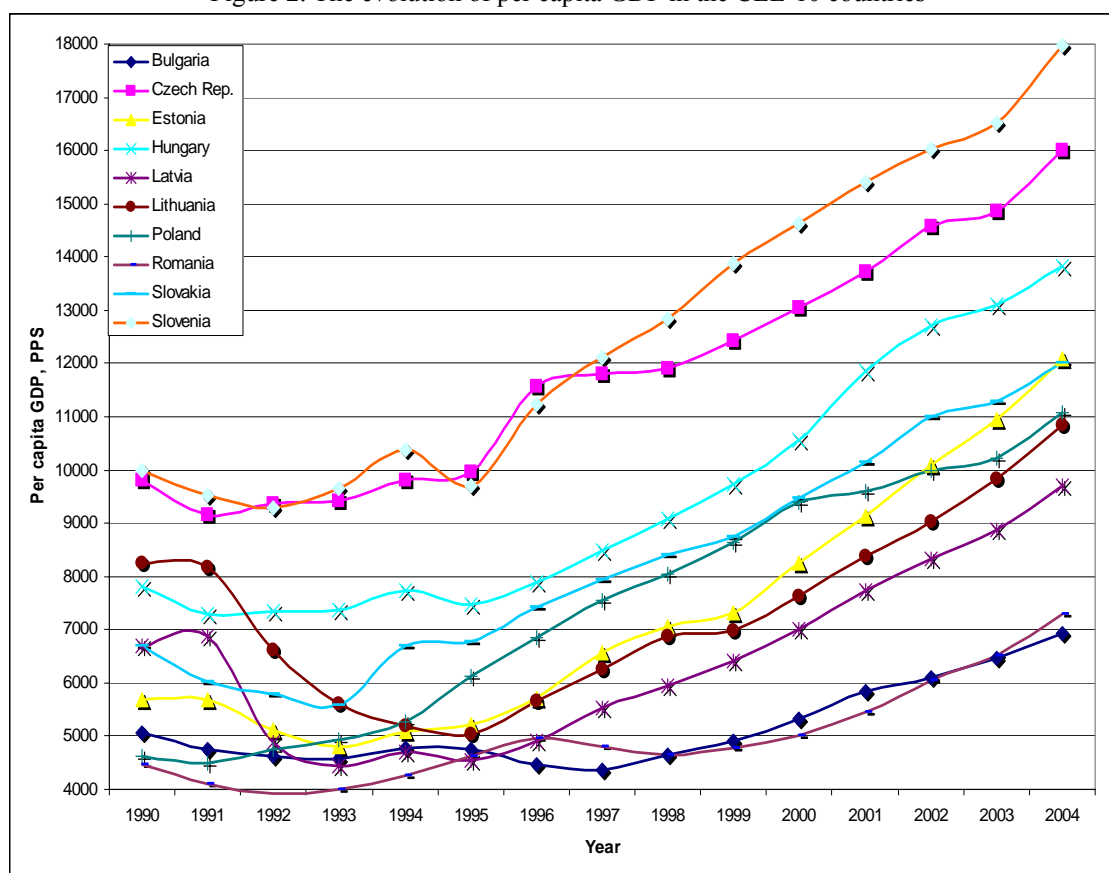
In spite of societal and economic transformation, the countries of the CEE-10 region, in the period 1990-2004, more than doubled their average per capita GDP in PPS. However, as figure 2 (based on Eurostat figures) shows, the discrepancies present across the region at the beginning of the period further widened.

Table 8. Real GDP growth rates CEE-10 countries, period 1991-2005

annual average percentages

	1991-1995	1996-2000	2001-2005
Bulgaria	-2.6	-0.8	5.0
The Czech Republic	-1.0	1.5	3.3
Estonia	-6.2	5.6	7.3
Latvia	-11.8	5.4	7.8
Lithuania	-10.0	4.2	7.7
Hungary	-2.4	4.0	4.1
Poland	2.2	5.1	2.9
Romania	-2.1	-1.3	5.9
Slovenia	-0.6	4.4	3.4
Slovakia	-1.7	3.7	4.8
CEE countries	-1.0	3.5	3.9
Euro area	1.5	2.8	1.5

Source: European Central Bank, Monthly Bulletin, 05/2007, p. 90, available at http://www.ecb.int/pub/html/index.en.html

According to the figures published by the European Central Bank (2007, p. 90) and reported in table 8, in the period of major reforms (mostly between 1991-1995) all CEE-10 countries registered significant rates of output fall, the Baltic States being in the lead. In contrast, in the subsequent period (also known as the years of reform consolidation between 1996 and 2000) – with the exception of the two late reformers (Bulgaria with -0.8%, and Romania with -1.3%) – all countries in the region registered real per capita GDP income growth. Thus, at the level of the CEE-10 region the average annualized real per capita GDP income growth was already 3.5%, higher than the annualized average growth rate of 2.8% registered in the EU-12 countries (the

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EURO area). In this period, the Baltic States (Estonia, 5.6%; Latvia, 5.4%, and Lithuania, 4.2%) led the region, but Poland (5.4%) and Slovenia (4.4%) also registered top performance.

Real per capita GDP income growth was successfully sustained over the period 2001-2005 with exceptional performances in the three Baltic States (Estonia, 7.3%; Latvia, 7.8%, and Lithuania, 7.7%) followed by the two late reformers, Bulgaria (5.0%) and Romania (5.9%). It is also important to note that the acceleration of real GDP growth in the CEE-10 countries, which in the period 2001-2005 reached a regional annual average of 3.8%, occurred in the context in which the EU-12 countries real GDP growth rate registered a slow down, being of 1.5%.

Figure 3. Per capita GDP divisions between the EU-15 and the CEE-10

EURO in PPP, 1991-2005
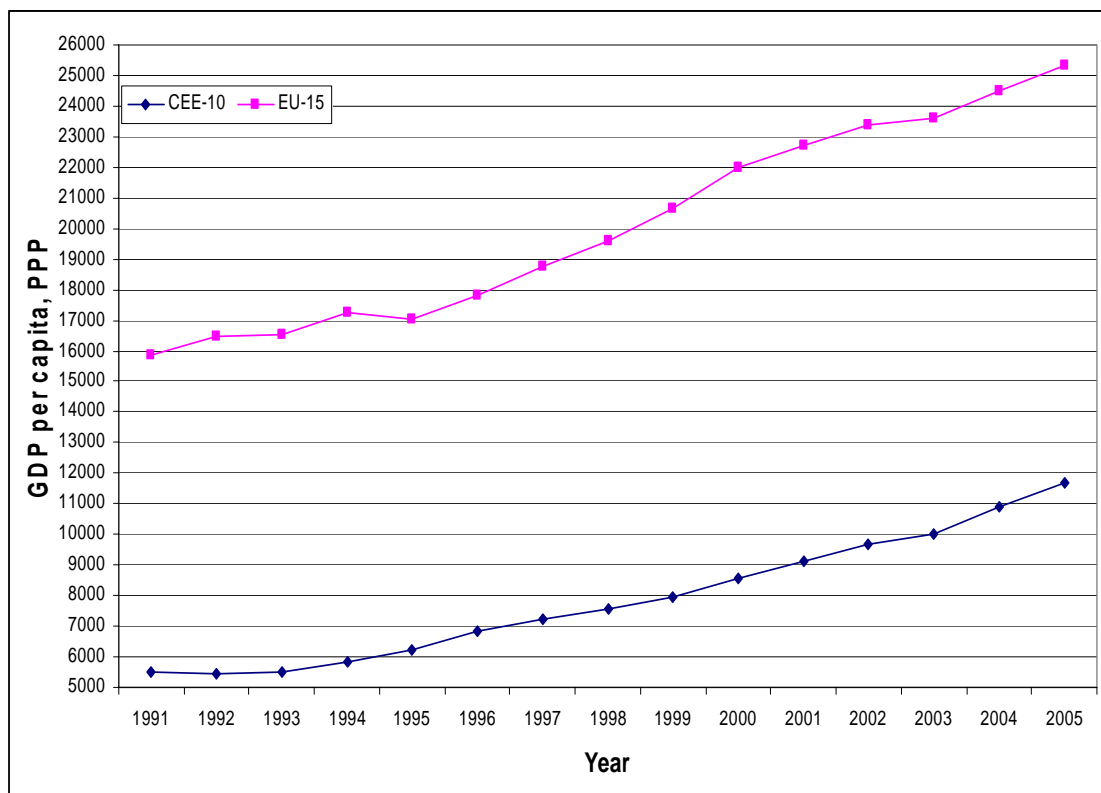
Despite this economic performance of the CEE-10 countries, there are still considerable disparities compared to EU member states. To illustrate the extent of economic disparities between the two regions, I look at the differences in terms of GDP per capita (see figure 3). In 1991, the mean GDP per capita in PPP of the CEE-10 countries was nearly three times lower compared to that of the EU-15. Although this gap somewhat narrowed by the year 2005, it was still more than twofold (2.16). Similarly, in the case of GDP in current prices, although the average growth rate over the period was appreciably higher in the CEE-10 countries (55%), if compared to the EU-15 (28.3%), the absolute gap between the two regions continued to widen.

If we look at 2004 data, we note that by the first wave of Eastern enlargement all the CEE-10 countries were below the mean EU-27 average. Even the top performing CEE-10 economies, namely Slovenia and the Czech Republic stood at 83% and 75.2% of the EU-27 mean. These two countries were followed by the group of the CEE-10 countries that registered around half of the EU-27 mean, namely Hungary (64%), Slovakia (56.7%), Estonia (55.7%), Lithuania (51.1%), Poland (50.7%), and Latvia (45.5%). The worst performing countries were Bulgaria and Romania, by far at the bottom of the rank, with only 33.2% and 34%, respectively. The only other EU-27 countries below the EU-27 mean were Cyprus (91.4%) and Malta (74.4%), which acceded to the EU along with the CEE-8 in 2004, and two EU-15 member states, Greece (84.8%) and Portugal (74.8%).

The differences among the EU-27 countries can be well visualized by taking the EU-27 mean and putting the countries according to their positions relative to this mean (see figure 4). The graph indicates that there are considerable differences in per capita performance both within the EU-15 and within the CEE-10. The best candidate country from the CEE region for reaching the EU-27 benchmark in a reasonable time

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frame is Slovenia, possibly followed by the Czech Republic, but none of the larger CEE-10 countries are in the proximity of the average.

Figure 4. EU-27 country per capita GDP performance, year 2004

EU-27=100%

GDP per capita year 2004
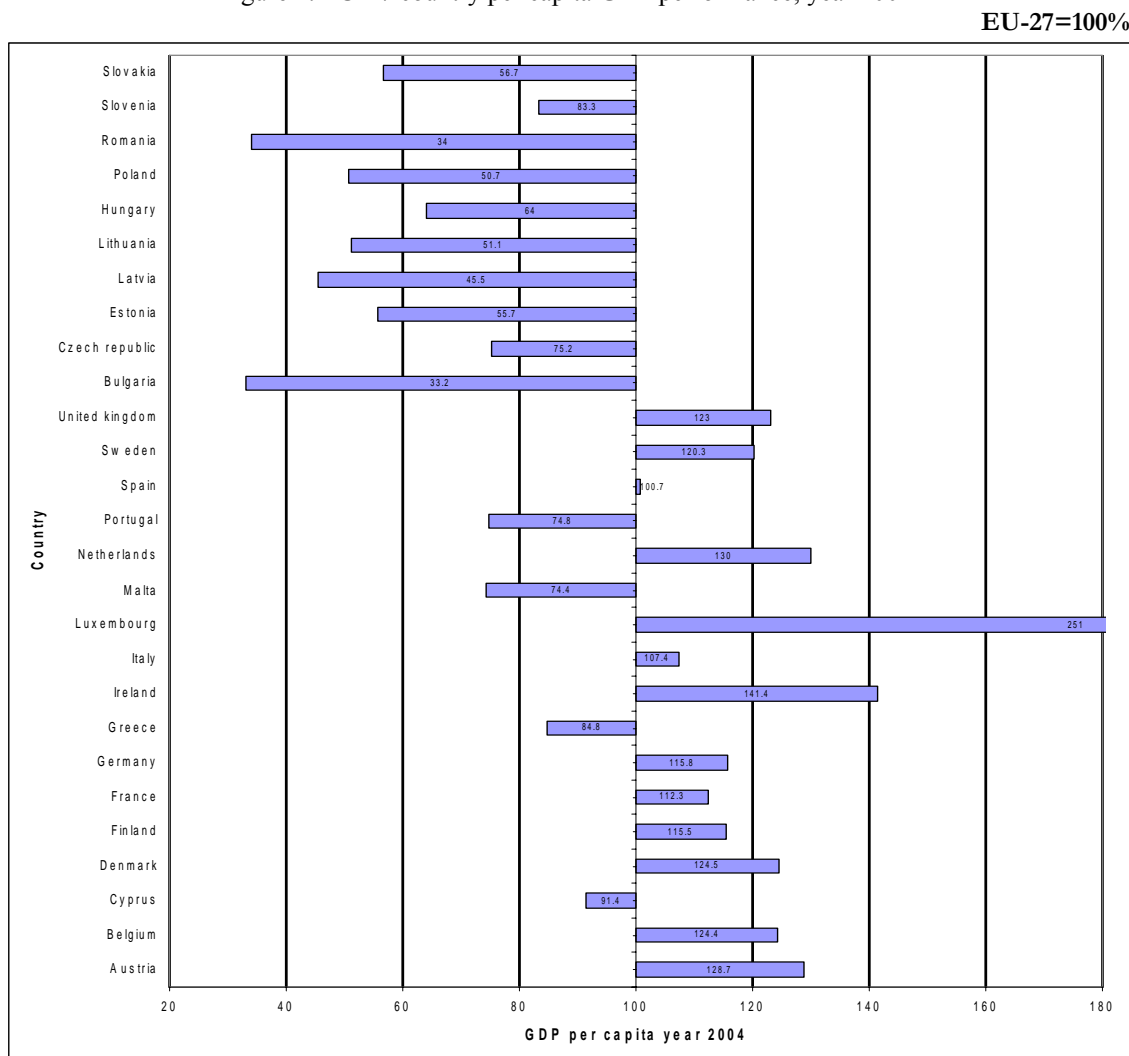
If we look at the NUTS-2 level in the CEE-10 countries, we observe that only the Praga region, the Bratislava region and that of Central Hungary are above the EU-27 average. At the other end are five of the Polish regions, with per capita GDP below 40%, and all the Romanian and Bulgarian regions (with only around 30% of EU-27 average) with the exception of capital city regions.

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Figure 5. NUTS-2 level CEE-10 per capita GDP in PPS

Year 2003, EU-27=100

Region (NUTS 2003) PPS, EU27=100

Region	Value
Východné Slovensko (SK)	42.3
Stredné Slovensko (SK)	46.7
Západné Slovensko (SK)	52.7
Bratislavský kraj (SK)	129.3
Slovenia	83.3
Vest (RO)	39
Sud-Vest Oltenia (RO)	28.8
Bucuresti - Ilfov (RO)	64.5
Sud - Muntenia (RO)	28.4
Sud-Est (RO)	30.7
Nord-Est (RO)	23.6
Centru (RO)	35.5
Nord-Vest (RO)	33
Pomorskie (PL)	49.6
Warmińsko-Mazurskie (PL)	39.4
Kujawsko-Pomorskie (PL)	45.4
Opolskie (PL)	43.6
Dolnośląskie (PL)	51.7
Lubuskie (PL)	45.4
Zachodniopomorskie (PL)	47.2
Wielkopolskie (PL)	54.5
Podlaskie (PL)	37.9
Świętokrzyskie (PL)	39.3
Podkarpackie (PL)	35.4
Lubelskie (PL)	35.2
Śląskie (PL)	57
Małopolskie (PL)	43.4
Mazowieckie (PL)	76.8
Łódzkie (PL)	46.7
Dél Alföld (HU)	44.2
Észak Alföld (HU)	41.9
Észak Magyaroszág (HU)	42.5
Dél Dunántúl (HU)	45.6
Nyugat Dunántúl (HU)	66.8
Közép Dunántúl (HU)	61.1
Közép Magyarország (HU)	101.6
Lithuania	51.1
Latvia	45.5
Estonia	55.7
Moravskoslezsko (CZ)	61.1
Střední Morava (CZ)	59.8
Jihovýchod (CZ)	67.4
Severovýchod (CZ)	63.7
Severozápad (CZ)	60.7
Jihozápad (CZ)	69.6
Střední Čechy (CZ)	69.9
Praha (CZ)	157.1
Yuzhen tsentralen (BG)	25.6
Yugozapaden (BG)	49.1
Yugoiztochen (BG)	29.9
Severoiztochen (BG)	29.3
Severen tsentralen (BG)	26.4
Severozapaden (BG)	25.6

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The Slovak regions, the Baltic States (which are NUTS-2 level regions), four of the Hungarian regions and the remaining Polish regions registered between 40% and 60% of the EU-27 average, while the Czech regions along with the remaining two Hungarian regions between 60% and 80% of the EU-27 average.

The above indicate that not only are the NUTS-2 level cohesion regions in the CEE-10 countries in general significantly below the EU-27 average, but there are also important per capita GDP income variations among the regions of the CEE-10 themselves.

In terms of employment rates, as indicated by figure 6, the differences between the EU-15 and the CEE-10 started to further widen as of 1997, when the rate of employment registered a steady increase in the EU-15, but a sharp decrease in the CEE-10 due to the economic reform measures implemented. The latter countries started to modestly recover the loss as of 2002.

Figure 6. Employment rate differentials between the EU-15 and the CEE-10

%

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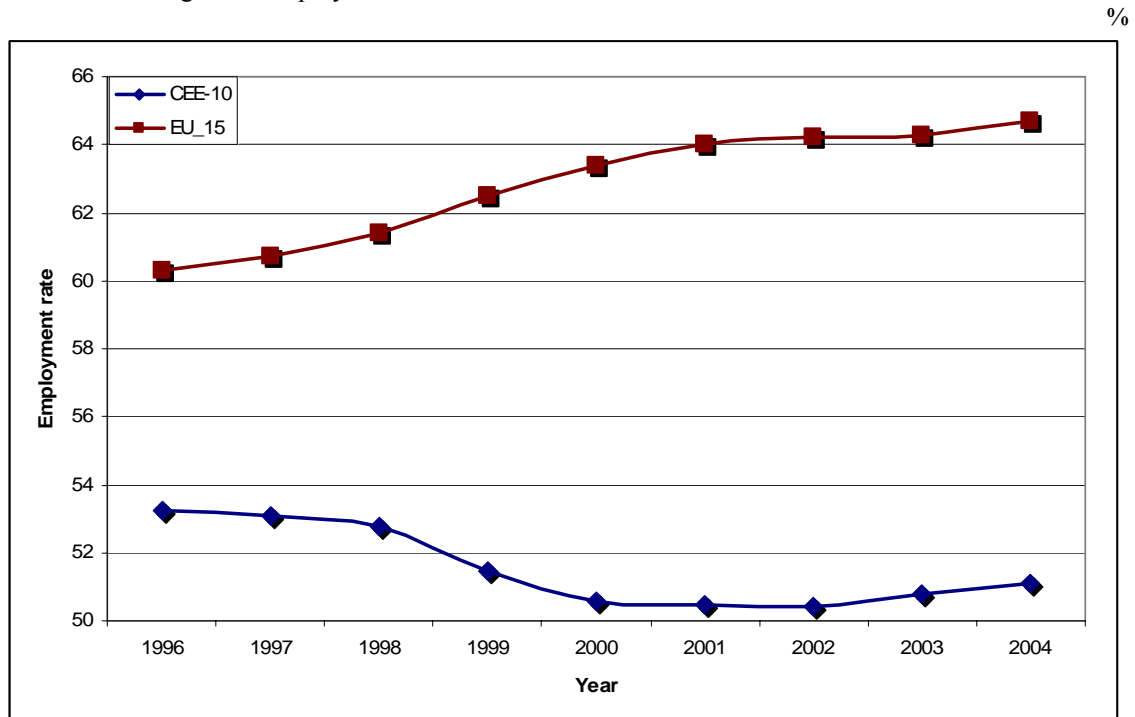
Thus, in 2004 the mean employment rate in the case of the EU-15 was 64.7% and in the CEE-10 countries it was 51.1%. According to the Eurostat statistical reports, the best performing countries were Estonia with 56.8% and Latvia with 56.1%, being the only ones in the relative proximity of the EU-15 average score. In contrast, the lagging countries, namely Bulgaria with 43.8% and Poland with 44.3%, were quite far away from both the regional and the EU-15 average.

Table 9. Main economic indicators of the CEE-10 countries

year 2004

	Surface Km2	Population in millions	Share urban pop.	Employment rate	Government budget balance	Gross external debt*	FDI inward stock*
Bulgaria	110 912	7.78	70.0	43.8	1.7	12 572	6 769
Czech Rep.	78 868	10.20	73.3	54.3	-2.9	33 212	42 035
Estonia	45 227	1.35	69.0	56.8	1.5	7 344	7 379
Latvia	64 589	2.33	55.0	56.1	-0.9	9 781	3 358
Lithuania	65 200	3.45	67.0	50.6	-1.5	7 687	4 690
Hungary	93 030	10.13	66.1	50.5	-5.4	55 150	45 956
Poland	312 685	38.20	61.5	44.3	-3.9	94 322	62 687
Romania	238 391	21.73	54.9	50.4	-1.3	21 698	15 040
Slovakia	49 034	5.40	57.5	49.1	-3.0	17 421	11 281
Slovenia	20 273	2.00	51.0	55.3	-2.3	15 278	5 580

* million EURO

Source: Eurostat statistical report.

For the same year, in terms of long-term unemployment, the regional average in the EU-15 was 3.3%, while in the CEE-10 it was 5.54%. These figures conceal an especially high unemployment rate among young people below the age of 25. Thus, while overall unemployment in the EU-15 was 7.95%, the rate of unemployment among young people was 16.7%. In contrast, in the CEE-10 countries, where overall unemployment for the same year was 9.85%, the unemployment rate among young people was 21.56%.

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The unemployment rate among the youth was 36.9% in Poland and 30.1% in Slovakia. These countries were followed by Romania (23.6%) and Bulgaria (22.4%), also with rates above the regional average. In the three Baltic States and Slovenia the unemployment rates among young people were already below the EU-15 average, while in the Czech Republic and Hungary the rates were around 19%.

In addition to the low employment rates registered in the CEE-10 countries compared to the ones in the EU-15 countries, there are also important labor productivity gaps. If we consider as benchmark the average score of the EU-25 for the year 2004, the aggregate performance of the EU-15 countries was above average, reaching a score of 106%. In contrast, the aggregate performance of the CEE-10 countries was much below the average, reaching a value of only 54.08%. Labor productivity differentials were significant also among the CEE-10. While Slovenia and Hungary registered 75% and 68.1%, respectively, of the EU-25's average, Bulgaria and Romania achieved merely 31.9% and 36.3%.

Figure 7. FDI inward stock to CEE-10 countries, period 1995-2005

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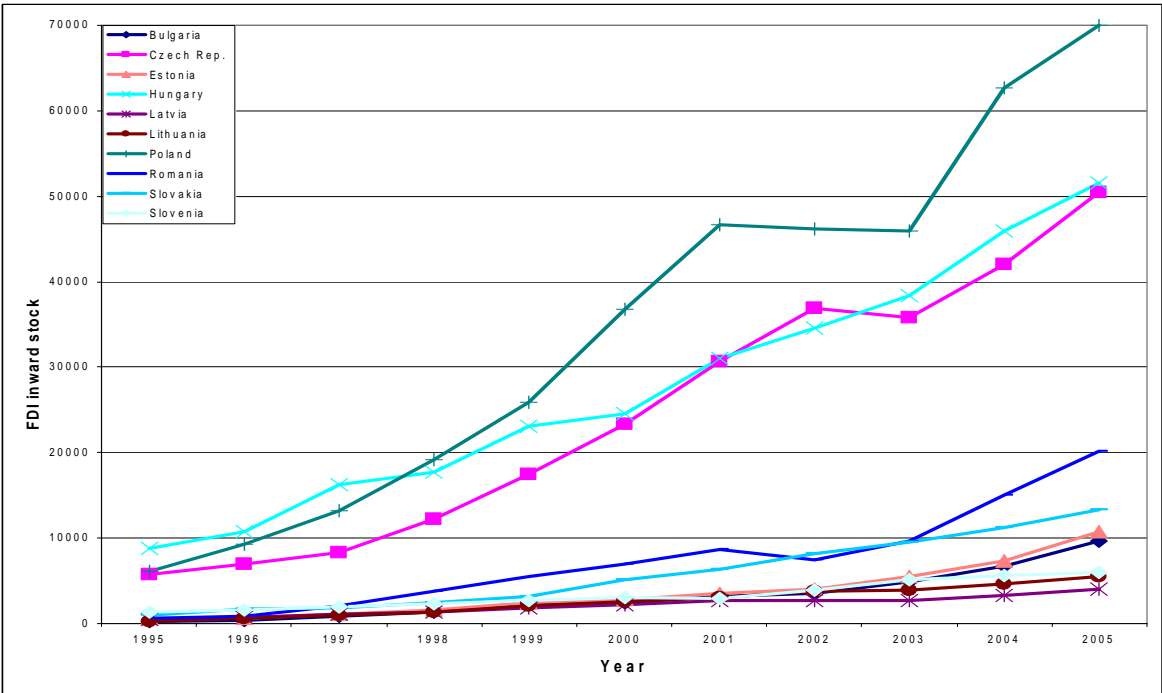
In terms of attractiveness to foreign investors, in the period 1995-2005 the stock of inward FDI to the region increased 9.5 times (see figure 7). Nevertheless, we observe that some countries were significantly more attractive than others. For instance, the early reforming countries, the Czech Republic and Hungary, each attracted more than three times more FDI than Romania. Furthermore, FDI penetration as a percentage of GDP also shows important country variations. For instance, net FDI assets represented in Estonia 70%, in Hungary 50.4%, and in the Czech Republic 44.3%. In contrast, in Slovenia they represented a mere 12% and in Poland 29%. For accuracy we need to mention that at the beginning of the period FDI in the CEE-10 countries was negligible, which makes their performance in terms of attracting FDI an effective indicator for the extent to which the reform policies implemented proved to be successful.

4.4 Linking policy reforms and growth

To verify my first research hypothesis, namely that macro-economic policy reforms carried out in the CEE-10 countries in the transition period have significantly induced per capita GDP income growth, in this section I propose a more formal evaluation of the relationship between macro-economic policy reforms and growth. For this reason, I estimate a simple regression equation of the following form:

$$y_{it} = \alpha + \alpha_1 PR_{it} + \alpha_2 ER_{it} + \alpha_3 PL_{it} + \alpha_4 TL_{it} + \alpha_5 CP_{it} + \alpha_6 BK_{it} + \alpha_1 INF_{it} + \varepsilon_{it}$$

where the independent variable is the annualized growth rate (y_{it}) for country i in year t. The dependent variables are the seven macro-structural fields discussed

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earlier for every country in each year. Separate regressions were carried out for the full period and the three sub-periods distinguished earlier. Although the model is simple (no lagged values are used to possibly improve the estimation scores), the results indicate a generally robust relationship between macro-economic policy reforms and growth performance. For instance, in the case of the model covering the full period the reform variables capture 26% of the variance of per capita GDP income growth performance.

Table 10. Single equation estimates of macro-economic stabilization and growth				
				CEE-10 countries
	1991-2005	1991-1995	1996-2000	2001-2005
Intercept	.370	-.187	.174	1.85
	(5.02)***	(-2.36)**	(3.72)***	(6.14)
Privatization	-.104	-.072	-0.78	.149
	(-3.85)***	(-2.49)**	(-4.56)***	(1.35)
Enterprise reform	.259	.088	.164	.387
	(.617)***	(1.98)**	(6.24)***	(2.29)**
Price liberalization	.025	-.045	.032	.306
	(0.83)	(-1.38)	(1.67)*	(2.45)**
Trade liberalization	-.045	.080	-.083	-.612
	(-1.45)	(2.42)**	(-4.25)***	(-4.85)***
Competition policy reform	-.010	.042	.006	-.210
	(-0.25)	(1.04)	(0.25)	(-1.34)
Banking reform	-.104	-.097	.022	.076
	(-2.51)**	(-2.17)**	(0.85)	(0.45)
Infrastructure policy reform	.088	.058	.174	-.026
	(3.20)***	(1.96)*	(3.72)***	(-0.23)
Adjusted R^2	0.13	0.9	0.32	0.12
F-statistics	4.29****	3.30***	12.39***	4.22***
Root MSE	17	.17	.10	.63
N	15	15	15	15

Statistical significance at: * $p<10$, ** $p<.05$, *** $p<.01$, ****$p<.001$

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According to table 10, the strongest explanatory variables, statistically relevant at the .01 level, are the privatization of state assets, enterprise restructuring and infrastructure policy reform. As theorized by the literature, privatization had a negative effect on per capita GDP income growth at the beginning of the transition period, but its effect became positive later on. Enterprise restructuring and infrastructure policy reform, carried out at a much slower pace and to a smaller extent than the reforms in the other policy fields, are positively related to per capita GDP income growth. This indicates that further reforms in these two fields could lead to further improvement in growth performance.

An interesting situation can be observed in the case of price and trade liberalization for the period between the years 2001 and 2005, when the EU accession was under preparation and a second generation of major reforms was implemented. More precisely, while price liberalization had a strong positive effect on per capita GDP income growth rates, trade liberalization had an even stronger but negative effect.

All the above indicate that the differences in the timing and scale of the reforms carried out by the ten countries under study are strongly associated with the per capita GDP income growth performance of these countries. Despite identified important growth performance for each country over the period 1991-2005, three clearly distinguishable groups of countries can be identified. First there are the leaders of growth, namely the Baltic States, Slovenia and Poland, followed by the group consisting of the Czech Republic, Hungary and Slovakia. The worst performing economies were those of Bulgaria and Romania, the two countries which were the last in implementing the necessary reforms.

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In this chapter, I presented the major macro-economic policy reforms implemented in the CEE-10 countries with special focus on the differences in the timing and scale of these reforms. This was followed by the analysis of the evolution of the economic performance in the CEE-10 region covering GDP income growth, employment rates and FDI.

In the case of policy delivery systems in the CEE-10 countries we observe first of all that considerable structural and institutional reforms were carried out since 1990. As a result, all ten countries adopted democratic rule of government and enrooted open and competitive market economies.

Despite this wide range of institutional and policy reforms, in the case of economic indicators the main figures indicate that there are still important differences left between the EU-15 and CEE-10 countries. Thus, despite the fact that in the period 1991-2005 per capita GDP income expressed in PPS more than doubled in the CEE-10 countries, if compared to the per capita GDP income in the EU-15 countries the gap narrowed in relative terms only, but in absolute terms it further widened. This highlights that there are important political-economic challenges which will need to be addressed by the CEE-10 countries in the subsequent periods. A key question is what further structural reforms need to be carried out in order to not only sustain current growth rates on the long-run, but also to further increase them to a level that would ensure convergence between the CEE-10 and the EU-15 countries. However, to achieve sustained reforms can be rather problematic considering the decreasing enthusiasm of citizens in the CEE-10 countries over the less than impressive returns of European accession in their daily lives.

Furthermore, the CEE-10 countries are increasingly facing the pressure to carry-out third generation reforms. For instance, labor market inflexibilities need to be dealt with both from the perspective of labor market productivity and the rate of occupation. The solutions for these policy reforms will not come from the EU, but will need to be addressed domestically, which might prove to have high electoral costs for ruling political parties and therefore is likely to be postponed as much as possible. Nevertheless, if the CEE-10 countries will downplay the importance of further reforms to be carried carry out following EU accession, they will most likely face increasing exposure to growth deceleration.

Similarly to Arratibel et al. (2007), I have found that despite important structural, institutional and policy reforms in the CEE-10 countries, there are still important gaps in terms of labor market conditions, and consequently, attention needs to be oriented to the importance of pursuing policies that target human capital accumulation in order to reduce labor market mismatch and to further increase growth in the CEE-10 countries.

My first research hypothesis, namely that macro-economic policy reforms carried out in the CEE-10 countries in the transition period have significantly induced per capita GDP income growth, has been verified, the results indicating a generally robust relationship between macro-economic policy reforms and growth performance. In the case of the model covering the full period of 1991-2005, the reform variables capture 26% of the variance of per capita GDP income growth performance. Furthermore, the results indicate that the differences in the timing and scale of the reforms carried out by the ten countries under study are strongly associated with the per capita GDP income growth performance of these countries.

Chapter 5. European Regional Policy and

Accession Conditionalities

5.1 Introduction

In Chapter 2 I presented an overview of the main academic developments and debates related to the challenge of linking institutional structures and policy regimes to the enhancement of market equilibrium conditions and the improvement of the steady state levels to which markets converge. Chapter 3 includes the hypotheses of the dissertation, while in Chapter 4 I discussed the major economic policy reforms undertaken by the CEE-10 countries and linked them to the growth performance of these countries, thus verifying my first hypothesis. This and the following chapters are dedicated to the verification of my second hypothesis, namely that the EU conditionality in the field of regional policy only limitedly influenced territorial reform in the CEE-10 countries.

During the early phases of democratization, the proximity to the EC/ EU offered the CEE-10 the prospect of joining a new supra-national initiative that had proved to be effective in creating the structures leading to democratic political stability, sustained high growth performance and social welfare. The declared choice of the CEE-10 countries to seek to adhere to the EC/ EU was also a statement on the type of growth path which these countries wanted to undertake.

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In light of these political choices and policy efforts, in this chapter I describe the European regional policy, including the reasons behind its emergence, the main stages of its evolution and the challenges of its implementation. Then I discuss the EU factors influencing the enrooting of regional governance, dealing separately with the EU conditionality in the field of regional policy

5.2 European Regional Policy

To introduce the framework of European regional policy, I discuss the rationale for which the European institutions and decision-makers considered it important to undertake actions at the European level. Once discussing the emerging policy field, I turn to discuss the different phases of regional policy. By this, I wish to emphasize the changing nature of this policy field with the different waves of enlargement. These dimensions of European regional policy are directly relevant for the understanding of the negotiation position adopted by the European Commission towards expected regional reforms in the case of the CEE-10 acceding countries.

5.2.1 Reasons for developing European regional policy

Initially, regional policy was a matter of domestic concern, being conducted by each member state at national level. However, it gradually gained institutional and legislative legitimization at European level.

In evaluating the possible reasons for the development of a European regional policy, authors generally identify three potential approaches, namely the compensatory, the redistributive, and the endogenous growth explanations.

As its labeling suggests, the compensatory approach claims that the development of a European regional policy is motivated by a compensation principle.

According to this, national states get compensated for the costs or disadvantages incurred by their membership. These costs or disadvantages emerge as a result of limiting the set of economic policy instruments that national states can use, e.g. custom duties, currency, subsidies available to national states to protect or support the interests of their regions. The compensatory approach seems to suggest that EU membership involves specific opportunity costs, which – given the principle of solidarity – should be compensated for in the case of the most backward regions.

The redistributive explanation is much closer to the co-operation spirit underlined in the founding treaty. According to this approach, the goal is to reach a more efficient allocation of the member states' resources, which will lead to further growth, and thus benefit all states. This principle of convergence has an important role in the European Social Fund and in the Structural Funds at regional level.

In the endogenous growth explanation the source of growth is identified at the location of resources, which – for given resources – are embedded in local environments. This approach favors factor mobility, such as venture capital and technological innovation, according to which the selection and employment of these potential factors of growth are regulated by competitive markets. The effect is the improvement of production efficiency and effectiveness, by which the theory predicts that the development potential of given regions is exploited to the maximum, and therefore growth is achieved in the lagging regions.

All these three approaches agree that the main reason for a European regional policy is to reduce developmental heterogeneity within the EU. Indeed, European regional policy gravitates around the notion of territorial and social cohesion, meaning that member states should share common developmental objectives and therefore undertake efforts to design instruments that foster economic and social integration.

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Cohesion is sought to be achieved through convergence, by actively seeking to close the developmental gap between regions with measures that assist underdeveloped or lagging regions in reducing the level of economic backwardness compared to developed or advanced regions.

5.2.2 Phases of developing European regional policy

Article 130 of the Treaty of Rome acknowledges the existence of uneven development within the European Community (EC), still it provides no means to deal with the challenges of this problem. Seemingly, the mere existence of such disparities was not a sufficient reason for the adoption of an EC regional policy, as its development had to wait till the 1970s.

The evolution of the European regional policy can be divided into five major periods. In the first phase, regional policy was exclusively the domain of the national states. Governments' main policy instrument was the operation of financial incentive programs and the provision of infrastructure with a strong redistributive component. The principle was similar to the one proposed by the "development-from-above" school, according to which a centralized regional policy is the most efficient way to deal with issues of macro-economic shocks, to benefit from economies of scale and to provide economic agents with insurance mechanisms. Through their policy measures, governments sought to make some disadvantaged regions more attractive to factors of production. For example, special tax-free zones were created to attract venture capital and to strengthen the business activities in these regions. In other regions, affordable public housing schemes were created to support labor force.

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Regional aid areas were designated by the national authorities, but in 1971 the Commission adopted the first principles to limit the use of government aids outside these areas. Some of these principles are still valid to date, namely that limits should be set to the amounts of regional aid depending on how severe the regional problem is; there should be transparency in aid provision so that aid could be measured and compared across countries; and the sectoral impact of regional aid should be monitored.

In the second phase, national incentive policies lost their popularity. With the strengthening of the European policy arena and the development of the European regional policy, they became less used (Keating, 1997; Bachtler, 1997). Partly, their place was taken by European level policies backed up by the European Structural Funds. Alongside the European Social Fund (ESF) created in 1958 and the European Agricultural Guidance and Guarantee Fund (EAGGF) set up in 1962, the European Regional Development Fund (ERDF) was established by the Council's Regulation (EEC) No. 724/75 of 18 March 1975, with the goal of providing European institutional financial means to support European cohesion through the development of the lagging regions. "The essence of the Structural Funds' operations has been determined by a process of high-level inter-state bargaining, primarily resolved by the central governments of the member states, with a kind of collusion by the European Commission and, to a lesser extent, by regional actors" (Allen: 2000, 245). The creation of the ERDF was determined by the accession of the United Kingdom, together with Ireland and Denmark, to the EC.

Until 1988, the ERDF mainly financed projects in areas designated centrally by the member states, each country having a quota of funding. So, the ERDF basically co-financed the priorities of national regional policy. The Commission could only decide

directly over the allocation of a small portion of the fund, which it used to fund initiatives outside the areas assisted by national authorities.

The third phase started with Spain and Portugal's accession to the EC in 1986, which considerably deepened regional disparities within the EU, and the adoption of the Single European Act, which resurfaced economic and social cohesion. Since provisions on economic and social cohesion were introduced into the Treaty, the legal basis for EU regional policy was created. This triggered several changes, which culminated in the 1988 revision of the Structural Funds. An essential outcome of this revision was the political endorsement of the cohesion principle. The revision involved a rapid increase in the Structural Funds budget, which in 6 years more than doubled. Emphasis was put on multi-annual planning, programming, and partnership between the Commission, the national and the sub-national authorities, and what is highly important is that European criteria were introduced for the designation of problem regions to benefit from funding. Of the five Objectives established, three were directly related to regional development, namely Objective 1 covering lagging regions with a GDP below 75% of the EU average, Objective 2 covering regions affected by industrial decline, and Objective 5b covering rural development areas.

The fourth phase was marked by the creation of the Cohesion Fund by the Maastricht Treaty in 1993. This Fund was meant to complement the Structural Funds and aimed to strengthen economic and social cohesion by supporting the least developed states to participate in the economic and monetary union. The Fund enabled Spain, Portugal, Ireland and Greece to meet the convergence criteria for the economic and monetary union and at the same time continued to invest in infrastructure to step up their development.

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In 1998, a new European strategy was endorsed by the European Council's December Summit in Luxembourg for the preparation of applicant countries. The key measure was the allocation of significant additional funding to accession countries. A few months later, in March 1999, at the Berlin European Council a political agreement was reached and the Heads of Government and States concluded on what is known as the Agenda 2000, which marked the start of the fifth phase.

The Berlin Summit provided the legal framework for the inclusion of the accession countries into the EU's regional development policy. The decision was taken to assist accession countries in developing their management capabilities and conducting administrative reforms necessary for the accession and successful performance in the European system. Since this phase in the development of the European regional policy already directly concerns the CEE countries under study, I will discuss it in more detail.

The Agenda 2000 included the reference policies of the EU for the period 2000–2006 and the financial framework, which was designed to meet also the needs of the 2004 enlargement. One of the priority areas covered was the reform of the Structural Funds. A main point of this reform was that instead of the six objectives of the previous period, the objectives of the Structural Funds were reformulated into three. Objective 1 was development and structural adjustment of lagging regions, Objective 2 was economic and social convergence of areas facing structural difficulties, and Objective 3 was adaptation and modernization of national policies and systems of education, training and employment. Regional policy support was allocated mainly to Objective 1 covering NUTS-2 regions with a GDP per capita below 75% of the EU average (i.e. almost all regions of the new member states) plus areas with very low population density, such as in Finland and Sweden, and also to Objective 2 covering

NUTS-3 regions suffering from industrial decline and above average unemployment as well as urban and rural areas with special problems. It was stressed that the Objective 1 eligibility criteria should be strictly applied in all cases. As for Objective 2 regions, a population ceiling was set on overall coverage, which was then distributed country by country; furthermore, it was decided that the aid should be the same amount per capita all over the EC.

Besides concentration on only three objectives, the number of Community Initiatives was also reduced from thirteen to four, namely INTERREG III, aiming to promote transnational, cross-border and interregional cooperation and balanced development; EQUAL, seeking to build transnational cooperation in view of combating discrimination, exclusion and inequality in the labor market; LEADER+, providing assistance for innovative initiatives aiming at sustainable rural development; and URBAN II, meant to regenerate urban areas facing economic and social problems. An important element of the Community Initiatives is that the role of national governments in the implementation of the funds is minimal, the main decision factors being the Commission and the eligible regions/actors. Of the four Community Initiatives, the ERDF contributes to INTERREG and URBAN.

The reform of the Structural Funds also involved a more precise definition of the roles played by the Commission and the member states. A clearer division of responsibilities was being sought, so it was decided that the Commission would only supervise compliance with the strategic priorities, the management of the programs being done at national level. A new step in the programming for the 2000-2006 period was that the Commission would have to present the Community priorities for each Objective. The second new step was that after the adoption of the Single Programming Documents and Operational Plans drafted by the member states based on the

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Community priorities, the member states or the regions responsible would prepare complementary programming documents, providing details on the beneficiaries of the proposed measures and the amounts allocated for each of these measures.

Since more responsibility was given to the member states in terms of the implementation of the Structural Funds, the new regulation put more emphasis on the importance of the partnership principle, introduced into the tasks of the Structural Funds in 1993. Accordingly, partnership was to be broadened to include local and regional governments, economic and social actors and other relevant bodies, and ensured at all the stages of interventions from preparation to evaluation. Furthermore, it was specified that the member states should consult the partners on the national plans before submitting them to the Commission.

The European system needs to solve, among others, the contradiction between the fact that national governments would like to maximize their resource allocation efficiency and effectiveness and the fact that they are still reluctant whenever transfer of authority – either up-ward, to the European level, or downward, to the meso-level government authorities – is proposed. Therefore, many checks and balances are built in the system so that national states retain some legal and political leverage over the way this transfer of authority is exercised.

The allocation of authority in the EU is a complex institutional web. Policy power exists at three fundamental levels: the European level, the national level, and the regional level. Harmonization among the three levels of policy agencies is a key objective of the European regional policy. Figure 8 represents the complexity involved in regional policy-making in the EU.

Figure 8. Regional policy-making in the EU
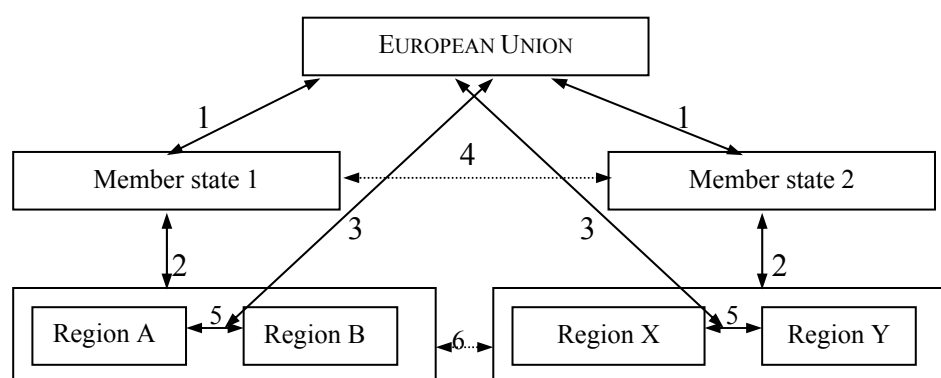
The figure shows that in addition to co-ordination among national regional policies, it is also necessary to have co-ordination and co-operation among meso-level policy agencies across countries. The regional policy of each member state has a certain impact on the other member states. That is one reason why countries are willing to give up some of their sovereignty, and give way to European co-ordination. The European coordination is needed not only at the national level, but also at meso-level policy harmonization.

5.2.3. Challenges of compliance

Following the events of 1989 it was for the first time that CEE-10 countries were faced with the challenges of developing an effective decentralized regional policy (Horváth, 2001: 169-170). The incorporation of the principles of the European regional policy constituted a direction of transformation based on the influences of the Western European model. The transfer of policy responsibilities to lower government levels implied the setting up of a new jurisdictional design through which regional policy could be delivered and developmental objectives achieved. As a result, sub-national

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public authorities have become agents in the design and implementation of the national regional policies, of the CEE-10 countries under study.

The complexity of economic activity and the competing objectives of different constituencies make regional policy one of the most debated policy fields. A fundamental issue is to define the types of activities that should benefit from the support of the public sector through its regional policy.

The desirability of some activities over others is closely related to the objectives of regional policy, which are multiple and sometimes even conflicting. Armstrong & De Kervenool (2000: 81-82) identify four main types of objectives simultaneously pursued by national regional policy. These are: strategic or political objectives, social objectives, economic objectives, and environmental objectives.

Political objectives – regional policies are driven by a set of political objectives. Supporting activities which, although non-economical, have special meaning and social value, can only be explained by the existence of political objectives, such objectives can be various and range from the preservation of traditional forms of community life, to the wish to keep labor mobility at certain low levels in order to allow minority communities to live in their own regions (e.g. political business cycle considerations).

Social objectives – Opening up national markets for international flows of capital and goods needs to be done taking into consideration, among others, local job seekers' opportunities. For instance, when deciding over large factory relocations, in addition to the economic justification, the effects that such rationalization of production might have on local communities (e.g. a heavy social burden) should also be considered. Equal schooling opportunity for children is another major social objective, just like discouraging labor market discrimination practices.

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Economic objectives – conventionally, the most important objectives of regional policy have been related to economic issues. From an economic perspective, any regional policy needs to address two fundamental issues: the equity and the efficiency objectives. However, market-led economic development, if left alone, creates special problems, such as overcrowding in industrial areas, large levels of pollution.

Environmental objectives – as attention has recently been directed towards environmental issues, regional policies also need to take into consideration special environmental standards. For instance, there are the requirements on industrial waste management. Thus, the slogan of the early 20th century "development at any cost" is considered to belong to the past.

Given the existence of conflicting objectives the different policy actors involved in designing and implementing regional policies will have different interests and motivations. These different objectives and preferences need to be reconciled when setting the institutional framework of regional policy.

5.3 EU factors influencing the enrooting of regional governance

The role played by the European accession process in the speed, nature and scale of reforms carried out in the CEE countries is considered to have influenced the changes in institutional arrangements (e.g. Zielonka 2001, Csaba, 2007, ch. 7) and the policy choices (e.g. Grabbe, 2001) in the development of governance systems. In the early phase of transition, all CEE countries declared that accession to the EU was their main long-term political priority. After signing the Association Agreements by year 1995, all the CEE-10 countries formally submitted their membership application. From the formal endorsement of the accession perspective by the EU member states until

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effective accession there were several phases, in which special conditionalities were set by the EU. These conditionalities had to be fulfilled by pre-set dates and following the established road-map. Besides the gate-keeping functions of the Commission the EU, adopted to impose policy or institutional outcomes in the candidate CEE-10 countries, there are also a series of instruments under the support of technical assistance, benchmarking and regular progress monitoring.

5.3.1 Accession conditionalities

This gate-keeping role of the EU strengthened the adaptation pressure in accession countries, as any negative reports about efforts towards accession had potentially an important impact on the popularity and sustainability of the national cabinets. Thus, it was the EU which decided when each country could obtain the official candidate status, when the actual accession negotiations would start, and when these could be considered finalized. However, the EU conditionalities in the field of regional policy is rather hypothetical than actual (Hughes et al., 2004) The authors consider that the "fluid nature of conditionality" in the field of regional policy and the management of structural funds, doubled by the inconsistency of the application of various conditionalities by the European Commissions raise doubts about the supposed causal relationship between conditionalities and policy outcomes related to regionalization in the CEE-10 countries.

In conclusion, we observe that in the literature there is very little consensus both on the extent at which these different factors shaped reform, and the interplay among these factors. Nevertheless, each of them were important all countries, while their role is likely to vary according to national context.

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Before discussing the debate surrounding the extent of the influence let us first look at the main accession criteria set by the European Union. The main conditionalities set by the EU in could be linked to the different phases of the accession process are the democratic conditionality, the liberalizing conditionality, and the acquis conditionality.

The democratic conditionality

The first step in the accession process of the CEE countries to the European Union was the signing, in 1991, of the Association Agreements with the EU. The conditions of the association status included a minimal set of non-negotiable political and economic criteria, which were spelled out at the Copenhagen European Council in 1993. More precisely, the preconditions of opening accession negotiations were formulated in terms of institutional stability to achieve democracy and legality based on constitutional law, protection of human rights, putting in place of functioning and competitive market economy, readiness to undertake the duties emerging from EU membership, and adherence to the political, economic and single monetary aims of the EU. The set of criteria to open accession negotiations laid down at the Copenhagen Council is termed in the literature the *democratic conditionality* of European accession (also referred to as the Copenhagen criteria).These created the context in which the accession implied measures to monitor, evaluate, and provide support for the efforts of associated countries from the side of the European Union.

The liberalizing conditionality

The first pre-accession strategy adopted at the Essen European Council in December 1994 complemented the already formulated Copenhagen Criteria and the financial aid

(PHARE) with multilateral discussions on policy measures to be adopted by CEE countries. The basic document was the Single Market White Paper, which – although not a legally binding text – soon became the handbook of CEE policy-makers in their relationship with the EU and the main instrument to regulatory harmonization. The White Paper provided the general framework for market liberalizing measures to be adopted in CEE countries according to the legislation that governs trade in the Internal Market. The White Paper did not include all the fields of the acquis, yet progress in implementing the foreseen measures became a benchmark in the assessment by the EU of the readiness of accession countries to undertake the responsibilities of membership.

In this sense, Pridham (2002, 2005) theorizes that the democratic conditionality influences the democratization process in CEE accession countries not only in the pre-negotiation phases of enlargement, but also in the phases of negotiation and when they become actual members of the EU. The verification are the instance of application of these conditionalities and the underlining of the importance of fulfilling the Copenhagen criteria and the pre-accession strategy by countries aspiring to membership is indicated by the fact that the Luxemburg European Council in December 1997 decided to invite Hungary, Poland, Estonia, the Czech Republic and Slovenia to accession negotiations, Slovakia was considered not in compliance with the pre-set political criteria, and therefore its invitation was postponed to a later date. The other CEE countries aspiring for EU membership were invited to accession negotiations one year latter by the decision of the Helsinki European Council.

Based on the opinion (avis) of the European Commission on the progress of CEE countries, the Luxemburg European Council also decided that as in *the Accession Partnership* all accession requirements and assistance be brought together in one single framework.

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The acquis conditionality

The second phase of the enlargement process regards the obligation of accession countries to adopt in their national legislation the whole EU legislations including rules, political principles and judiciary decisions. The acquis is divided in thirty-one chapters on different policy fields and comprises a total of over 80,000 pages, but its content is subject to change as new legislation is adopted and the basic Treaty suffers modifications. Another peculiar feature of the acquis is that it is the result of political negotiations among member states and therefore it often remains fuzzy and open for interpretation. This leaves an opportunity for negotiations between the EU and accession countries. Nevertheless, in contrast to previous rounds of enlargements, in the case of CEE countries the EU took a maximalist approach, accepting derogations only in very exceptional cases.

5.3.2 Technical assistance

Acknowledging the costs and risks associated with implementing fundamental institutional and policy reforms the EU included among the instruments of negotiation direct technical assistance to support the reforms related to fulfilling accession conditionalities. Until year 1999 technical assistance to candidate countries was ensured through the PHARE program. In terms of technical assistance on July 1, 1999 the Commission decided over the financial allocation based on the priority objectives for each member state as well as the four community initiatives. As mentioned in the Community Initiatives for the period 2000–2006 were INTERREG, LEADER, URBAN and EQUAL, ISPA and SAPARD. The Instruments for Structural Policies for

Pre-Accession (ISPA) support the structural adaptation of the CEE-10 accession countries to the EU.

The allocations for each country for the pre-accession instruments are presented in table 11.

Table 11. Annual pre-accession funding for period 2000-2006

In Million Euro

	PHARE	SAPARD	ISPA		Total	
			Minimum	Maximum	Minimum	Maximum
Bulgaria	100.0	52.1	83.2	124.8	235.3	276.9
The Czech Republic	79.0	22.1	57.2	83.2	158.3	184.3
Estonia	24.0	12.1	20.8	36.4	56.9	72.5
Hungary	96.0	38.1	72.8	104.0	206.9	238.1
Latvia	30.0	21.8	36.4	57.2	88.2	109.0
Lithuania	42.0	29.8	41.6	62.4	113.4	134.2
Poland	398.0	168.7	312.0	384.8	878.7	951.5
Romania	242.0	150.6	208.0	270.4	600.6	663.0
Slovakia	49.0	18.3	36.4	57.2	103.7	124.5
Slovenia	25.0	6.3	10.	20.8	41.7	52.1
Total	1,085.0	520.0	1,040.0		2,645.0	

Note: Total annual PHARE allocation include multi-country programs is 1,577.00 million EURO
Source: Commission Commission, available at:
http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/pdf/tab22.pdf.

This time, in the case of ISPA, the budget indicates minimum and maximum amounts, which allows for flexibility of funding among countries to a certain extant. This was designed as an instrument to prepare the CEE-10 accession countries to prepare for the Structural Funds, where regions compete with each other at EU level instead of the national one.

The Structural Funds also had a budgetary allocation of EUR 24 billion for the CEE countries to join the EU before 2006. These different amounts are grouped both by country and different funding schemes, and are summed-up in table 12. Considering the considerable gap that exists between the EU-15 and the CEE-8 countries it is not surprising to observe that a large share, slightly over 61%, of all structural fund

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allocations are under the territorial principle based Objective 1 region funding. The second largest category, the Cohesion Fund, amount to nearly 35% of all allocations, which one more time reiterates the emphasis that is put on the elimination of structural differences that exist between the two regions.

Table 12. Structural Fund Strategies CEE-8 for period 2004-2006

Country	Obj. 1	Obj. 2	Obj. 3	Interreg	Equal	Cohesion Fund*	Total in € million
Czech Rep.	1,454.27	71.30	58.79	68.68	32.10	936.05	2,621.19
Estonia	371.36	0.00	0.00	10.60	4.07	309.03	695.06
Hungary	1,995.72	0.00	0.00	68.68	30.29	1,112.67	3,207.36
Latvia	625.57	0.00	0.00	15.26	8.03	515.43	1,164.29
Lithuania	895.17	0.00	0.00	22.49	11.87	608.17	1,537.70
Poland	8,275.81	0.00	0.00	221.36	133.93	4,178.60	12,809.70
Slovenia	237.51	0.00	0.00	23.65	6.44	188.71	456.31
Slovakia	1,041.04	37.17	44.94	41.47	22.27	570.50	1,757.39
Total	14,896.45	108.47	103.73	472.19	249.00	8,419.16	24,249.00

Note: Cyprus and Malta are not included. Also, Bulgaria and Romania are not included as the acceded to the EU in year 2007, and they benefited of pre-accession technical assistance in period 2004-2006.

Source: European Commission, Memo/04/156.

In addition to the European Structural Funds for the period 2000–2006, two pre-accession instruments were created to complement PHARE in assisting the CEE-10 countries which signed Accession Partnerships, which are SAPARD. Although PHARE was established in 1989, up to the Copenhagen Council held in 1993 its primary role was to provide assistance to the economic restructuring and the political changes that CEE countries were undergoing after the breakdown of the socialist system. In March 1997 the Commission adopted new PHARE orientations for the candidate countries, which provided the framework for the annual programming of PHARE. Relying on the Accession Partnerships signed between individual accession

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CEE countries and the EU, complemented by the National Programs for the Adoption of the Acquis (NPAAs), the Commission identified the priorities to be followed in the strategy of candidate countries.

It soon turned out that the Commission underestimated the resources and time needed to accommodate the changes introduced by the new PHARE orientations, so the 1998 programming timetable was not realistic. The NPAAs also proved to be insufficiently reliable to guarantee that national budgets, PHARE programs or other forms of assistance satisfactorily covered all objectives. Programs focusing on promoting economic and social cohesion became an important component of the PHARE financing line only in 2000. For instance, a recent assessment of the most important pre-accession assistance PHARE, in the period 1990-2004, had a total of 16,67 billion EURO allocation available to countries according to county budgets, shows the limited success in accessing these funds. From this amount two-thirds remained un-allocated. Table 13 shows that less than 70% of all PHARE funds (11,57 mil. EURO) was actually paid to beneficiaries, although some 80% was contracted. This leaves a total of 5.1 billion Euros assigned to the support of accession preparations to remain unspent. The table also indicates that there are important national differences in terms of absorption capacity of these funds. For instance, while Hungary contracted about 92% of all PHARE funds available actual payments represent 80% of the total amount available to Hungary. At the other end we find Romania with a rate of 68% of funds contracted and payments around 57%. The figures of all other countries are between these two cases.

Table 13. EU PHARE funding for period 1990-2004

In Million Euro

	Commitments	Contracts	Payments
Bulgaria	1,792.15	1,313.36	1,120.22
Czech Republic	898.24	730.86	674.87
Estonia	337.44	268.96	254.42
Hungary	1,462.59	1,341.13	1,174.57
Latvia	410.84	330.82	313.30
Lithuania	797.00	750.53	654.92
Poland	3,930.96	3,292.59	2,856.95
Romania	2,723.40	1,860.11	1,559.37
Slovakia	702.39	585.70	491.40
Slovenia	351.64	278.49	255.64
Czechoslovakia	230.49	231.82	228.88
East Germany	34.49	28.86	28.86
Multi-country programs	3,005.90	2,382.52	1,959.91
Total	16,677.50	13,395.73	11,573.29

Source: Commission Staff Working Document Annexes to 2004 Report on PHARE Country
Sections & Additional Information, 2005, p. 90

The key measure of ISPA is to provide financial support for investment in the environmental and transportation sectors. In what concerns the environmental infrastructure component of the fund, projects have been supported for the following categories: drinking water, treatment of wastewater, solid-waste management, and air pollution. In the case of transportation, the investments relate to corridors and the Transport Infrastructure Needs Assessment (TINA) network. ISPA's objectives were determined for each candidate country based on the Accession Partnership, the National Program for the Adoption of the Acquis, the National Development Programs, the Regular Reports and the National ISPA Strategies for Environment and Transportation. ISPA funds have been allocated to target countries based on multiple criteria, including population, per capita GDP (in purchasing power parity), and land surface area.

SAPARD was created with the aim of assisting the restructuring of rural sectors with emphasis on agriculture in the candidate countries. The two core priorities of

program were to help the implementation of the relevant provisions of the acquis communautaire, to revive rural economies undergoing major structural reforms and to contribute to efforts to modernize agricultural production. The main regional development objectives that the program sought to contribute to the improvement of market efficiency in rural areas, while creating jobs and encouraging the implementation of environmental protection measures. A unique feature of the pre-accession fund was that candidate countries themselves managed the investment projects throughout the funding cycle (from project selection to making payments).

For the CEE-10 countries that acceded to the EU in 2004 and 2007, respectively, the incorporation of the principles of the European regional policy constituted a direction of transformation based on the influences of the Western European model. The timing and efficiency of this transformation have varied from country to country, the different outcomes and effects leading to major debates and the emergence of several interpretations.

The goal of these incentives is to support reform efforts and thus acknowledging the limited capacity of accession countries to sustain wide-scale reforms trade privileges and financial aid were also used.

5.3.3 Benchmarking

Benchmarking is the third instrument used by the European Commission to assess the progress of fulfilling the accession conditionalities by the CEE-10 countries. Grabbe (2003) considers that benchmarking is used by the European Commission in the phase of accession negotiations to create ranking among accession countries in the different policy areas, and to provide best practice examples. These rankings provide strong

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signals to the national public opinion regarding the effort of domestic decision-makers and the advancement of the country towards fulfilling accession requirements. As these reports take the form of comparative analysis it has a strong impact on public opinion, and possibly provides a leverage on policy-makers through shaping domestic debates related to European accession serve the scope of influencing reform processes and the institutionalization of different policy fields.

These are complemented by Groenendijk (2004) who operated the distinctions between organizational, policy and policy system benchmarking. In relation to the CEE-10 countries the both policy and policy system benchmarking are used, and often time after providing individual assessments of different countries in various fields, also reporting comparative assessments. The author discusses the different benchmarking strategies that are used within the EU to provide learning opportunity through information exchange along different policy fields. According to the author besides policy learning purposes benchmarking is to provide the framework for progress monitoring in various policy fields and multilateral surveillance. These in the case of the CEE-10 countries are complemented by regular progress reports, which have important internal political leverage ion the assessment on the performance of the country's government.

5.3.4 Regular progress monitoring

Another important dimension of the enlargement process regards the periodic evaluation of the EU of the extent at which different accession criteria were fulfilled and accession countries, and whether they could advance towards becoming actual members of the Union. These results are published in regular reports, which sum-up the progress made by the countries in the different areas, the possible problems that

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might appear and the steps to be taken in order to comply with accession criteria. As Csaba (2007) points out that the opinion of the Commission is regarded in the CEE-10 countries as having a much higher stake in domestic politics than in the case of old member states. Furthermore, Csaba (2007: 167) considers that "Regular Reports tended to be overly simplistic, entering into debates of purely domestic nature, where the Community has no competence whatsoever, even with its incumbents".

In the following section, I will study in more detail the main influence of these three factors in the case of regional policy and co-ordination of structural funds. Here attention is dedicated mainly to the analysis of the impact these three factors played in the shaping of the institutional structure and governance in the case of regional development.

5.4 EU conditionality in the field of regional policy

The development of regional policy and the carrying out of administrative regionalization in the CEE countries was one of the main preoccupations to deal with the increasing disparities within each country and increasing pressures towards decentralization from lower levels. In the EU accession process the relevance of regional policy steams from the policy and institutional change required to be implemented in terms of measures related to economic and social cohesion, as well as the implementation of measures to achieve territorial cohesion. Therefore, not only CEE countries needed to set-up regional governance systems given domestic pressures of decentralization, but in light of the accession process the EU solicited that the newly adopted policies to be aligned to common practice and regulatory norms of the EU. As a result, the emerging institutional and governance structures of regional development

regimes in the CEE countries following reform have been shaped by the historical legacy of the pre-reform socialist and the political economic context in the early reform period, the socio-economic structure of the society, as well as the rules set by the EU. Considering the possible relative importance of each of these three factors the literature could be grouped according to the envisioned policy convergence or divergence that is hypothesized.

In this light, there are the theories that argue that European accession has override all other factors and the different conditionalities imposed through this process are the single most important factors that shape the institutional and policy structure of regional governance in CEE countries. These theories predict based on the similar requirements formulated by the EU vis-à-vis accession countries that the outcome will be an institutional and policy convergence among our countries in the process of regionalization, or the emergence of institutionally similar regional development regions across countries. According to this institutional convergence hypothesis the EU exports its multi-level governance into the CEE countries and historical legacy and national contexts are overshadowed by rules imposed through the accession process. Furthermore, the extent of EU leverage on national governance systems is sensitively stronger in acceding CEE countries if compared to "old" member states as before becoming member states the former need to fulfill the acquis conditionality. In this argument enlargement is a potential source to reinforce the European level governance, as newly acceding countries are modeling their national governance structures according to its principles.

In contrast to this unconstrained accession conditionality hypothesis, there are authors who argue that although there are inescapable conditionalities before adhering to the European Union their implementation and therefore impact on national

governance systems (including regional governance) is limited as each country adapts these rules to their specific national context. In this conception the adaptation of the European accession conditionalities is national contexts with different historical legacies and the political economic context lead to different national governance systems. This is even more the situation in the case of regional governance where the EU conditionality is less

Dieringer and Lindstrom (2002) distinguish two waves of decentralization in CEE countries according to the sources that are considered to have led to their implementation. First, there is the decentralization that is driven by internal political processes during transition when local authorities are restored their autonomy. Second, there is the set-up and or strengthening of meso-level/regional authorities as a condition to becoming prepared to fulfill the obligation stipulated in the EU's regional policy. In all countries, excluding Poland, regionalization became an important policy issue only when accession negotiations were opened in the field of regional policy and the co-ordination of structural funds.

Taken as a whole these theoretical contributions of the Europeanization literature emphasize the importance of European conditionalities on the emergence of peculiar regional governance in acceding CEE countries. Nonetheless, the debate on the extent at which the specific conditionalities and national contexts interact remains an open question. To better understand regional governance I analyze the main choices of each of the ten countries under focus.

The main source of the EU conditionalities in the field of regional policy and the co-ordination of structural instruments is Council regulation (EC) no. 1260/1999, which defines the general provision on Structural Funds, and thus constitutes the reference in the negotiations with the CEE accession countries. Official negotiations

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between EU and membership candidate CEE countries on the chapter "Regional policy and co-ordination of structural instruments", chapter 21, started in April 2000 in the case of Czech Republic, Estonia, Hungary, Poland and Slovenia. In the case of Latvia Lithuania and Slovakia negotiations were opened almost one year later in March 2001, while in the case of Bulgaria it was November 2001, and March 2002 Romania. The negotiations were.

In contrast to other fields in the case of regional policy there is no required legislation to the transposed into national legislation. Instead, the emphasis of accession requirements fall on the development of various capacities that relate to membership responsibilities that originate in European regional policy. Thus, the framework of analysis of these membership responsibilities related capacities could be defined along the following dimensions:

- *Territorial organization* – the requirement to adopt sub-national territorial division to collect statistical information on economic development in territorial areas defined according to the NUTS structure.

- *Legislative framework* – to development of the national legislative framework on regional policy planning to ensure the implementation and co-ordination of structural instruments.

- *Institutional structures* – the creation and strengthening of the administrative capacity at national and regional levels that ensure the implementation of the structural instruments.

- *Programming capacity* – the provisions of Council regulations no. 1260/1999 related to the design of development plans need to be followed, in terms of multi-annual programming and by respecting the rules of partnership principle

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at the different phases of the implementation of structural funds, and to align to standard evaluation and monitoring rules.

- *Financial management and control* – Structural and Cohesion Fund specific control protocols need to be adopted according to EU standards, and co-financing capacity needs to be ensured.

These conditions, although imply important institutional restructuring at the level of ministries and the need to set-up NUTS-2 level administrative and programming capacities, did not explicitly require the CEE-10 accession countries to follow a given model of regionalization. In fact, sometimes at the frustration of the European Commission, its influence over the extent of regionalization processes referred only to the policy regimes under which decisions were elaborated and implemented, and not to the institutional structure of the decision making-process.

5.5 Summary

This chapter presented the general context in which the CEE-10 countries accession negotiations took place. It started with the description of the European regional policy, focusing on the reasons behind its emergence, the main stages of its evolution and the challenges of its implementation. Then it went on to discuss the EU factors influencing the enrooting of regional governance, including the accession conditionalities and the instruments of technical assistance, benchmarking and regular progress monitoring. Finally, I dealt separately with the EU conditionality in the field of regional policy.

Factors that are internal to the EU, i.e. the evolution of its institutional structure and policy-making, constituted into external factors for the CEE-10, as accession countries needed to develop compatible institutions and policies to perform in the larger

European institutional framework (for instance in the framework of regional, cohesion policy). These EU driven factors framed the conditions that were identified to be fulfilled before the CEE-10 countries could be considered institutionally prepared to undertake the responsibilities related to EU membership.

The accession conditionalities, as we have also seen in the Europeanization section of the literature review, are supposed by several authors to be the instruments that dictated the speed of reform and shaped the institutional and policy choices of CEE-10 policy-makers. However, in the case of the EU conditionality in the field of regional policy, it has turned out that – although it implied important institutional restructuring at the level of ministries and the set-up of NUTS-2 level administrative and programming capacities – it did not explicitly require the CEE-10 accession countries to follow a given model of regionalization.

After preparing the ground for the verification of my second hypothesis, in the following chapter I will assess the extent to which the EU conditionalities influenced regionalization in the ten CEE accession countries, discussing the main similarities and differences of the regional governance systems across the countries under study.

Chapter 6. Institutional Reforms in the CEE-10 Countries

6.1 Introduction

This chapter deals with the analysis of the reforms carried out in the CEE-10 countries in their efforts to modernize the public administration system as part of the larger societal reform process. Its scope is to test the second hypothesis of the dissertation, namely that the EU conditionality in the field of regional policy only limitedly influenced territorial reform in the CEE-10 countries.

In what concerns the historical legacy of the pre-reform context it can be stated that, although in the region socialist governments fell relatively quickly, the dismantling of the institutional and policy-making of the socialist type governance structures proved to be more challenging. The first political steps towards building the new regimes were to organize free popular elections and to change the fundamental constitutional acts in each country.

In terms of territorial governance, all the CEE-10 countries were built on the principle of "democratic centralism", according to which local authorities were organized according to the model of soviets of double subordination. This implied that both the executive board elected by the local assembly and the administrative apparatus were subordinated to state organs at a higher administrative level. As a result, after the regime change, the implementation of large-scale administrative reforms were needed

under conditions of a weakened capacity of the public sector to perform its functions, and the opportunistic behavior of national and local elites.

As all the CEE-10 countries define themselves as nation states, political regionalization as option was rejected in all cases, and instead administrative decentralization was carried out. The major debates related to regionalization in the CEE-10 countries can be conceptualized along the issue of reforming meso-level governance structures inherited from socialist times. This, in Hungary, for instance, led to the limitation of powers of County Councils, as they were perceived as strongholds of the former socialist elites.

In the previous chapter I described the context of the accession conditionalities formulated by the EU in order to prepare the CEE-10 countries to be able to undertake the responsibilities related to their future membership. This chapter introduces the theoretical debate related to the decentralization of state functions to lower administrative levels, which will set the context for the case by case analysis of the set-up of meso-level government tiers in the CEE-10 countries. During the presentation of each country case, I discuss the extent to which this process is related to the regionalization processes implied by the EU conditionality. More precisely, I look at whether or not the NUTS-2 (Cohesion) regions are actual meso-level government tiers in the case of the studied states.

6.2 The decentralization debate

In the literature there are several arguments that support the carrying out reforms seeking to achieve high levels of decentralization (Rodinelli & Cheema, 1983; Osborne & Gaebler, 1993; Foster & Plowden, 1996) and there also many arguments that favor

the centralized provision of governmental services. Moreover, several counter-arguments for decentralization have been developed (Olsen, 1975; Ophuls, 1973; Segal, 1997).

Traditionally a fundamental conceptual difference existed between unitary and federal states, namely the core changes introduced in unitary states by the adoption of specific forms of decentralized regional policies concern the reconfiguring of political and economic space by the multiplication of policy-regulatory bodies at lower state authority levels. Such policy domains are the ones of public spending and taxation policy. Consequently, the authority of local policy-makers' has been expanded from policy implementation to other phases of the policy process as well. Thus, local policy-makers have the possibility to choose among different policy options regarding the policy fields or stages over which they have authority.

The difference between multi-tier states and single-tier states started to fade with the development of the subsidiarity principle applied in the European Union. The traditionally federal peculiarity of political diversity of preference principle as the key in legitimating the institutional and property rights system started to be applied in national states as well. Under these conditions from a public choice perspective, Tiebout's (1956: 416-419) interpretation based on the mobility level of individuals for multi-tier states becomes relevant for national states as well. According to this a market of community level economic policy is created and a web of interdependent preferences will emerge.

The public choice literature tried to redefine this debate by drawing attention to the specifics of policy domains and on the analysis of the advantages and disadvantages of governmental service provision at different levels of centralization for given policies. These studies focus mainly on the effects of decentralization on state capacity and the

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quality of governmental service provision. Nevertheless, not even this attempt of reconciliation has been successful in dealing with the most important problems of the field, namely why economic development policies of most developing countries proved to be least successful in reaching expected results (There are a few examples of developing countries, such as Singapore, Chile or Taiwan, which have been successful in sustaining efficient economic development policies.).

The fiscal federalism literature is mainly dedicated to the study of the fiscal co-ordination between multi-tier governments based on the specific responsibilities assigned to each level of government. The solution provided by this literature consists in the identifying the optimal level of provision of goods based on their territorial scope. Public goods with national scope will be provided at national level using national revenue sources, such as a centralized tax system. On the other hand, the potentially most efficient provision of public goods with local/regional scope is the local/regional level.

The demand level of public services in these local communities will be determined not only by the local needs, but also by the relationship among communities. At inter-community level due to "horizontal" fiscal externalities a highly mobile population will migrate in way so maximize their utility. At this level inefficiency in the achieving of market equilibrium depends on resident mobility levels, the existence of interdependent preferences and the availability of knowledge about these other opportunities. If we add to this demand level the supply side, for example the labor market, a complex system of optimization emerges. In this context, families will evaluate the specific costs and benefits of choosing a residential location, based on the available knowledge to them.

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The central issue among single-tier states and multiple-tier states does not concern the necessity of public provision of economic development, but rather the way in which it is performed. The core issues concern of setting-up comprehensive regional development policies, or the issue of who does what. These issues have been subject to debate in Western democracies for a long period of time (Page & Goldsmith, 1986; Cummings, S., 1995). For example, in the 1980's Great Britain the public debate regarding the loosing of the City's (London) control over series of competencies as measures of centralization adopted by the Thatcher administration. In France sustained activism for greater local competencies has been facing ever-growing resistance from the central authorities.

On the central governments' side decentralization does not mean that it either totally or at least partially withdrew from actual policy-making. Although, the institutional possibility for local policy agency and the institutional constraints on national policy agency are given still the issue of agency within these new institutional frameworks are posing many fundamental problems and questions regarding the roles and functions of the public sector, which are answered in an equivocal way, if addressed at all. Consequently, many related issues remain under close scrutiny and heavy debates by the scientific community and not only.

The rationality is that by introducing a market of public services provided by territorially delimited authorities the existing national center-periphery relations are changed from the type of principal agent ones into two separate leagues, by adjusting. In these two leagues functionally delineated policy authority and responsibility functions are allocated among central and territorial states institutions.

First, there are the lower-level government tiers, which by having similar responsibility functions constitute into the decentralized governmental supply of

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services. These issue specific and territorially delineated public spheres constitute a separate/ additional market of services among which individuals can select based on own preferences.

Second, there is the central government, which retains well defined functions, among which important due to this change is the leveling the field of action among local governments. Thus, through the institutionalization of regions (Keating, 1988: 211) regional policy becomes central in implementing economic development policies.

Furthermore, the domestic process of decentralizing regional policy means that meso-level public policy actors take over some responsibilities previously fulfilled by the central state administration. Cohen and Peterson (1996: 10 - 11) as well as Rodinelli (1999: 2 - 4) describe four possible forms of decentralization, from among which governments can choose during the policy-making authority reallocation in transforming countries.

First, there is the *political decentralization*, mainly developed and applied by political scientists. This type of decentralization supposes different forms of transfer of decision-making power to lower levels of authority. In this case, the locally elected representatives of the citizens are endowed with extensive policy and decision making authority over local matters. Most often, the implementation of this form of decentralization involves constitutional reform. The expected results of political decentralization are enhanced local political participation of the citizens and the articulation of local political life.

According to Cohen and Peterson's typology, the second type is *spatial decentralization*, applied by economic geographers and regional planners. This involves different forms of promoting the emergence of regional growth poles, trying to reduce the concentration of economic activity in a few large urban areas. Rodinelli

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(1999) names fiscal decentralization as the second type of decentralization. According to this, lower tier governments receive some leverage over local tax revenues to effectively perform the function allocated to them. The explanation for this difference in the second category is that Cohen and Peterson's (1996) typology is a summary of different conceptions of decentralization used in different fields of inquiry. Instead, Rodinelli's (1999) typology takes into account the underlying difference between the functions of the public sector, namely the delivery of services and the issue of governmental revenue sharing among tiers of government.

The third is *market decentralization*, most commonly used by economists to evaluate and promote economic liberalization, privatization and deregulation of service provision. This form of decentralization involves that the private market sector is allowed to ensure their provision. In the case of market type decentralization we commonly find private firms as well as non-governmental organizations working in partnership with the public sector.

The forth type is *administrative decentralization*, which supposes specific forms of power and function sharing schemes at domestic intergovernmental level. This type of decentralization is of special interest in studying the case of the CEE-10 countries, as each has implemented some form of administrative decentralization. Therefore, I will present briefly the taxonomy of this form of decentralization.

The authors identify three forms of administrative decentralization, i.e. deconcentration, devolution and delegation. Deconcentration is understood as the transfer of policy-making authority in the jurisdictional authority of local governments. We speak of devolution when the central government transfers to the local governments, but retains the principal function in the assignment of authority.

Delegation is conceptualized as task specific authority transfer either with or without the direct supervision of the central government.

In the case of the CEE-10 countries we observe that the administrative reform carried out that meso-level government level involved besides the transfer of responsibilities over various policy fields, also the transfer of delegated responsibilities, which although performed by the meso-level governments remain under the supervision of the central government.

In the following sections, I discuss the type of decentralization that was undertaken in each of the CEE-10 countries.

6.3 Meso-level governments in the CEE-10 countries

In the case of the countries belonging to the group of the small nation states (Estonia, Latvia, Lithuania and Slovenia), their full territory qualify for NUTS-2 level in the EU. In the case of the three Baltic States, all of them had a two-tier local government system during socialist times. But while Estonia abolished the district level following the local elections in 1993, in *Lithuania* the first local government level was abolished. In *Estonia* there are fifteen counties, but these do not qualify for NUTS-3 level, and they are appointed by the Prime Minister for a five-year term, and represent the government at regional level.

In *Latvia* there has been limited interest in the creation of meso-level government authorities. Despite provisions both in The Concept of Self- Government Reforms, of 1993 and the Law on Administrative Territorial Reform, of 1998, a two-layer local government system was introduced. Nevertheless, even in this case, the NUTS-3 level regions remain mainly of statistical reasons.

The case of *Slovenia* in year 2000 a proposition of dividing the country in two NUTS-2 regions, one being Ljubljana and the second one the rest of the country. This was strongly opposed by the Commission and finally dropped. Therefore, although twelve Regional Development Agencies were eventually created at the NUTS-3 level, the regions they serve remain strictly statistical in purpose.

In the case of *Bulgaria* a number of twenty-eight regions (oblasts) were set-up with responsibilities related to the implementation of policy at regional level. At this level there are no direct elections; instead each region has a Governor, which is appointed by the Council of Ministers, and the Governor is supported in its activities by a regional administration. The regions are also dependent of central government subsidies, which all together make them to be deconcentrated state administration instead of a second-tier of local government.

In *Hungary* the meso-level government tier, the county, has strong historical roots, and therefore it has enjoyed significant levels of autonomy and considerable powers over various policy fields. Nevertheless, the first reform (Act LXV on Local Governments) carried out by the center-right government coalition sought to limit the influence of socialist elites at county level, and consequently adopted measures that seriously reduced the financial independence and limited the policy responsibilities of the county. Thus, counties have been virtually transformed into agencies that control and maintain public infrastructure. Weakening the authority of regional administrative units under conditions of high local government fragmentation offered the central government increased leverage over local matters.

In terms of administrative organization, each of the 19 Hungarian counties has a directly elected County Assembly and its own administrative body called the County Self-Government. The main weakness of counties lies in their financial dependence on

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central government transfers. This strongly limits the capacity of counties to develop and implement own policies.

The only significant revenue at the discretion of counties is 25% of PIT; however, even in this case county right towns can retain the personal income tax collected in their territories for themselves. As a result, counties in fact mostly benefit from personal income tax collected in rural and small urban areas, where the amount is rather marginal.

Setting up the County Development Councils in the year 1996 A missed opportunity for significantly strengthen meso-level governances in Hungary was the limited capacities created through the County Development, set-up. Although these Councils were formed at county level to undertake the responsibilities related to the programming and county level development fund management, the limited funds made available for the three major development funds limited the scope of the Councils. For instance the Targeted Decentralised Fund and the Territorial Equalization Fund and the Targeted Fund for Regional Development are all allocated from the central government budget, and only in the case of the latter fund have County Development Councils some discretion over the purpose of investments.

Besides central control, another main weakness of the funds available to County Development Councils is that they have a strong equalization character, being allocated according to GDP performance and population, no local co-funding being required to access the funds.

In the *Czech Republic,* despite early local administrative reforms, the set-up of meso-level governments is significantly delayed compared to the other CEE countries although provisions for the creation of meso-level governments were already laid down in the 1993 constitution. The motives for the delay were multiple, the most important

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ones being the lack of regional pressures to carry out such reform, the negative association of regions with territorial units from the socialist time, and the lack of motivation of national stakeholders to decentralize powers and resources to an intermediary government level. Although the act on the establishment of the higher-level territorial self-governing units was adopted in the year 1997, it only became effective in January 2001, after the organization of regional elections in November 2000. The formal definition of the meso-level government tier was provided in the Act on Regions (No. 129) adopted in year 2002. Accordingly, fourteen self-governing regions were created, each having a directly elected Regional Council, which elects from among its members both the Regional Board and the President. Besides the executive bodies, there is also a Regional Office, which fulfils the administrative responsibilities at regional level.

Similarly to Hungary, the meso-level government in the Czech Republic also has very limited fiscal autonomy, as most of the funding comes from the central government under the form of direct targeted subsidies to finance public services delivered by regional authorities. According to the provisions of the act on the budgetary allocation of taxes, in the shared taxation system of income tax and value added tax three-fourths of taxes go to the central budget, and only the remaining one-forth is allocated between local and regional governments, which leaves regions with around 3% of tax revenues.

Of all the CEE-10 countries it is *Poland* where territorial reform was most debated publicly. The central issue of the lively debates related to the role historical legacy should play in the design of new territorial. The preoccupation of the Polish elite to build the legitimacy of the new system on history led to the setting up, as early as 1990, of a State Commission with the task of identifying possible ways of territorial

reorganization and methods of implementation. The activities aiming at territorial reform are set back by the results of the 1993 elections, but relaunched following the 1997 elections. From the start of the transformation process in Poland the goal of the Solidarity movement was to implement wide-scale decentralization and carry our wide administrative reforms to curve the influence of the bureaucracy socialist times inherited. In contrast to other CEE-10 countries, the administrative reform and the regionalization of the country was a prominent public policy issue, addressed with the involvement of local and regional elites in the debate. The outcome of the political debates was that in 1998 the historical regions were reestablishment in most of the cases, and a compromise was achieved on the creation of a number of 16 voivodships. With the same reforms the sub- or migro- regions (powiats) were reintroduced. In the same year direct elections were held simultaneously for the gmina, powiat and voivodship levels.

In terms of organizational structure, the Voivodship Council is elected directly by popular vote. Once constituted, the Voivodship Council elects the Voivodship Marshall, who acts as the head of the council. The creation of regional self-governments (voivodships), which correspond to NUTS-2 level cohesion regions, is unique among the CEE-10 countries. Yet, the organization of voivodships and the unclear allocation of various competences among government tiers limit the administrative and policy efficiency of regions.

Romania is the example where administrative reform and regionalization were clearly separated both time and legislation. Thus, the former was set by the Law of Public Administration (69/1991) and Law of Local Elections (70/1991), which establishe a two-layer local government system with local and county self-governments, yet the Law on Local Finances (189/1998). However, there was much

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criticism regarding the limitations of this regulatory framework, and self-governance was established only in the year 2001, when the principles of local authorities fiscal autonomy was introduced.

The County Councils similarly to local self-governments are elected directly by popular vote. County Council President, elected by Country Councilors, undertakes the executive responsibilities on behalf of the Council. Each Council has its own administrative structure with the number of maximum employees defined by national law. The main responsibilities of county self-governments are to deliver activities related to county level development and provide public services county level. The main sources of financing are direct central government transfers and a share of income tax at the discretion of the County Councils. Over the years the share of income tax transferred to the Councils significantly increased, yet it seems to have stabilized at around the value of 10%. The Councils also administer an equalization fund in value of 15% of income tax collected at the county level. The allocation of the sums from the equalization fund among local authorities is often discretionary as the central government does not enforce the application of pre-established rules.

In *Slovakia,* although plans for carrying out administrative reforms and introducing a meso-level government tier, in fact, this was set-up only in the year 2001 under the form of eight regions. The 2001 parliamentary voting on the historical areas based twelve regions or to adopt the eight regions model led to government coalition crises. Besides their own self-administration competences the regions received also a series of responsibilities transferred from the central state administration. Each region has a directly elected council, and as opposed to the other countries discussed, in Slovakia the chairman of the region is directly elected by popular vote. Nevertheless,

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meso-level governments lack sufficient institutionalization as they do not enjoy fiscal autonomy.

6.4 The set-up of Cohesion Regions

The NUTS system was introduced in the EU in year 1998 to provide the framework for collecting and reporting statistical data on sub-national public administration levels for purposes of establishing EU level cohesion priorities. The classification did not intend to re-shape administrative structures in the member states, yet – by tying eligibility for structural funds to regional level social conditions and economic performance – it led to an adaptation pressure in the case of potentially beneficiary countries. Thus, a number of administrative reforms followed, at least in the sense of developing administrative and institutional capacities to access available funding. This system does not pose the requirement to reform the local administrative system, which could vary by the national context of each country. In the case of the three NUTS levels population thresholds were created. In this sense, NUTS-1 level macro-regions should have a population between three and seven million, NUTS-2 regions between eight-hundred thousand and three million, while NUTS-3 regions between one hundred fifty thousand and eight-hundred thousand.

A special provision was made that countries with a population below the threshold need to remain one NUTS unit. This is of special importance in the case of the smaller CEE-10 countries (i.e. Estonia, Latvia, Lithuania, and Slovenia). Each of the six countries corresponds to NUTS-1 and NUTS-2 levels. In contrast, the larger countries, such as Poland is divided into six NUTS-1 regions.

The EC Regulation (1059/2003) acknowledges that administrative units do not need to be set-up at all NUTS levels, in which case the given NUTS level needs to be established by the aggregation of several lower level and contiguous administrative units. There are also provisions about the possibility of deviating from the population thresholds in the establishment of NUTS regions in special historical, socio-economic, cultural or geographical circumstances.

The institutional structure including the three NUTS and the two local authority level in the CEE-10 accession countries can be summed up in table 14. In the case of the three Baltic States and Slovenia considering the size of the countries all administrative and policy capacities related to regional policy and the management of Structural Funds was developed at national level.

The regionalization process in the *Czech Republic* is the most unambiguous example for the prevailing of endogenous factors over the EU conditionality. Although the administrative reform and the creation of the fourteen regions coincide with the development of the eight cohesion regions, the choice made was to separate the two levels. Thus, the fourteen regions were created so that they correspond to the NUTS-3 level as the second self-government tier, and in parallel eight cohesion regions were setup, three of the fourteen meso-level governments are also cohesion regions (Prague, Stredoceský and Moravskoslezský). With the exception of the Severovýchod cohesion region, which is composed of three counties (Liberecký, Královehradecký, Pardubický), the remaining four cohesion regions are formed of two counties each.

In terms of organization, in the year 1996 the Ministry of Regional Development was set up as the Managing Authority of the Joint Regional Operation program. At the initiative of the Ministry, in a Regional Steering and Monitoring Committee was established in each cohesion region in 1998, with members appointed

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by the Ministry. At regional level each region has a so-called Regional Board of the Cohesion Region, which is formed of ten representatives of the county/ counties and the delegates of the Ministry of Regional Development. In the case of the three regions where only one county forms the cohesion region, the County Council also serves as the Cohesion Board. The Board appoints the Regional Development Committee, which – besides the representatives of the region, local authorities and other administrative bodies – also includes representatives of the business and the civic sector.

At the level of cohesion regions the Secretariat of Regional Council has been created. These secretariats are different from the Development Agencies, which do not necessarily function at the level of cohesion region. This and the fact that the Ministry of Regional Development is in charge of drafting the bylaws strongly limit the capacity of cohesion regions to become functional units. Thus, we can conclude that cohesion regions in the Czech Republic are much more deliberative bodies rather than actual government actors. The functions they should perform are in fact split between the Ministry of Regional Development and the NUTS-3 level counties.

In *Hungary,* besides the two local government tiers, the Hungarian legislation regulating national regional policy also recognizes three levels. There are three macro-regions country (NUTS I), namely Közép-Magyarország, Dunántúl and Alföld és Észak. Each of these macro-regions comprises different number of NUTS-2 cohesion (planning and development) regions. Közép-Magyarország is formed of the NUTS-2 region with the same name, which is made up of Budapest and Pest. In contrast, Dunántúl is composed of three cohesion regions and nine NUTS-3 level regions, and Alföld és Észak are also composed of three cohesion regions, and nine NUTS-3 regions. As already discussed the highest local authority level, or the correspondent to the meso-level government level is the 20 NUTS-3 level counties.

Table 14. The NUTS and LAU classification of the 10 CEE accession countries

	NUTS-1	NUTS-2	NUTS-3	LAU-1	LAU-2
Bulgaria	2 macro-regions	6 planning and statistical regions	28 districts	264 municipalities	5336 settlements
Czech Republic	-	8 cohesion regions	14 regions (kraj)	77 districts	6244 municipalities
Estonia	-	-	5 regions	15 counties	241 municipalities
Latvia	-	-	6 statistical regions	7 republican cities 26 districts	523 towns, amalgamated local municipalities and parishes
Lithuania	-	-	10 counties	60 municipalities	449 neighborhoods
Hungary	3 macro-regions	7 planning and statistical regions	19 counties (megye) 22 county right towns	168 Microregions	3130 municipalities
Poland	6 macro-regions	16 voivodships	45 sub-regions	314 powiats 65 powiat rights cities	2478 gminas
Slovakia	-	4 planning and statistical regions	8 regions	79 districts	2 891 settlements
Slovenia	-	-	12 statistical regions	58 communes	192 settlements
Romania	-	8 planning and statistical regions	42 counties	-	2978 towns and communes

There was intense debate about the procedure to be used to define planning and development regions. Finally, the decision was to create seven development regions, which were formed by the grouping of several counties. The borders of each development region are identical to the borders of its member counties. This was laid down in Act No. XXI of 1996 on the regional development and physical (regional) planning (Act on regional development).

The Parliament, which, among other responsibilities, adopts of the National Regional Development Concept, within which the guiding principles the regional policy, the objectives of regional policy and the long term priorities of regional policy are defined. Besides adopting regulation on the statistical and territorial structure of the country, it also deliberates and provides resolutions on the Government's reports about the extent to which regional development objectives have been implemented. The other major actor at this level is the Government, which is responsible for: the elaboration of a system for the regional harmonization of sectoral and professional developments and interventions, and then the inspection of the operation of the new type co-operation between the ministries and other national organizations; taking into consideration that the regional development institutional and tool system should be more and more adequate to the EU accession, and the regional development institutions should, as soon as possible, be capable for the use of the regional political tools of the EU; particular attention should be paid to possibilities of exploiting international co-operation; the work organization forms, being developed in addition to the regional development councils at the regional level, should be analyzed, and the models most appropriate from a professional and legal point of view should be assisted as well.

The Act on regional development stipulates the setting up of the National Regional Development Council with the responsibilities to develop the drafts of the national regional policy and to provide advice concerning changes (such as eligible areas and grant schemes). Being a deliberative body, it is composed of the chairman (the Minister in charge of the Regional Development portfolio); the presidents of the national Chambers of Commerce; one representative of the employers' side and one of the employees' side of the National Council of Labor, the ministers, the mayor of Budapest; one representative of the national association of municipalities; and some

other members with no voting rights. The National Regional Development Council has a secretariat called the National Regional Development Center.

Besides weak institutionalization the main weakness of the Hungarian NUTS-2 institutional structures is the high degree of direct central government or the indirect interventions through the deconcentrated organs into regional decision-making processes.

In *Poland* the consolidation, in year 1999, of the 49 voivodships into 16 larger regions opened the opportunity for the regionalization of the country at the level corresponding to cohesion regions (NUTS-2). The Act on Voivodship Self-Government, adopted in year 1998, stipulated that the main responsibilities of voivodships and the character of the relationship between Voivodships and local and national public authorities. To decrease the opposition against the consolidation of voivodships by reducing them from 46 to 16, special clauses were introduced about the independence and non-subordination of local governments to the voivodships.

The main responsibilities of voivodships include the drafting of the development strategy with the purpose of sustaining national and cultural awareness, the stimulation and support of voivodship level economic development, the enhancement of the economy's competitiveness and innovation capacity at the level of the voivodship. Besides, the voivodship also implements the regional development policy in its territory through creating conditions for economic development, maintaining and articulating public and communication infrastructure, supporting RTD activities and education, and promoting the voivodship. International cooperation is also among the main responsibilities of voivodships, involving among others the identification in its territory of international cooperation goals, setting priorities for collaboration and association to international cooperation platforms.

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Besides own tasks voivodships also undertake the implementation of delegated tasks, such as public education with emphasis on tertiary education, the promotion of culture and the protection of cultural heritage, public service management (road infrastructure, water and sewage infrastructure management and development), consumer protection, employment generation and national defense.

In parallel with the creation of meso-level governments at NUTS-2 level the Provincial Governor (Voivod) office was set-up, the main responsibility is to ensure the control over the legality of the voivodships' actions. The presence of this prefecture type control institution creates important tensions at the regional level, as voivodships undertake not only self-governance, but also state functions as well.

In *Romania* according to the Act no. 151 on Regional Development of 1998, modified by the Act of 315/2004, regional development aims at stimulating and diversifying economic activities, stimulating investments in the private sector, contributing to decreasing unemployment. The main objectives of the national regional policy include the reduction of existing regional disparities by the balanced development and revitalization of the disadvantaged areas and by preventing the emergence of new imbalances.

According to the above mentioned acts the National Board for Regional Development is a deliberative body, with no juridical personality, having as its purpose the promotion of the main objectives of the regional policy in Romania. The Board has the responsibility to approve the National Strategy and the National Program for Regional Development, to submit proposals to the national government concerning the formation of the National Fund for Regional Development, and to various programming and controlling functions related to the priority setting and utilization of public funds. The National Board for Regional Development helds ordinary and

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extraordinary sessions, and is chaired by the Prime Minister and 32 members. The membership is split between Cohesion level and Ministerial level representatives. The wide representation of central government agencies creates a centralization of decisions at the national level.

Regional policy is viewed as a collection of measures planned and promoted by the local and the central public administration authorities, having as partners different actors (private, public, volunteers) in order to ensure a dynamic and lasting economic growth, through the effective use of the local and regional potential, in order to improve living conditions.

In order to apply the regional development strategy defined by the legislation, a number of eight cohesion or development regions were set up in Romania. Each development region comprises several counties. The development region is a freewill association of neighboring counties, represents the implementation and assessment framework of the regional development policy. Development regions are not territorial-administrative entities and do not have legal personality, being the result of an agreement between the county and the local councils. The policy institutions of the cohesion regions are the Regional Development Board and the Regional Development Agency.

The Regional Development Boards are deliberative bodies, which coordinate at regional level the activities promoting the objectives implied by the regional policy. Each Board is constituted of the presidents of the County Councils (within the development region); a representative of the city local councils (within every county of the region); and a representative of the municipal local boards (within every county of the region). The president and the vice-president are elected for one year, from different counties in the region. The prefects of the counties may participate at Board

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meetings, but without voting rights. Representatives of the local, municipal, city and communal boards as well as representatives of other institutions and organizations with competence in the field of regional development may be invited to participate at the meetings. The Manager of the Regional Development Agency participates at each reunion of the RDB. According to the law, the main responsibilities of the Board include, among others, deciding over the regional development strategy and over the regional development projects selected and submitted by the RDA; approving the allotment of the resources of the Regional Development Fund and the budget of the Regional Development Agency; and coordinating the activity of the Regional Development Agency, making sure that the objectives of the regional development policy are obeyed and ensuring an equal and fair treatment towards all the counties that make up the region.

Regional Development Agencies are public use non-governmental non-profit organizations with legal personality. They are organized and function in accordance with the Law of Regional Development. The Manager of the Agency is appointed by the RDB. The financing of the organizational and operational expenditures of the Agency is provided from the Regional Development Fund, the amount being approved by the Board.

The main responsibilities of the Agency include: the designing the regional development strategy and programs; implementing the regional development programs, in accordance with the decisions adopted by the RDB; identifying the disadvantaged areas within the development region, together with the local or county councils, and submits the necessary documentation, previously approved by the Board, to the Ministry of Development and Prognosis and the National Development Board; submitting to the Ministry of Development and Prognosis proposals to finance the

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approved development projects from the Fund for Regional Development; attracting financial contributions to the Regional Development Fund; managing the Regional Development Fund.

In *Slovakia* the first step towards developing consisted regional policy was the creation in 1998 of the Ministry of Construction and Regional Development. This institution soon became the focal point for the implementation of the provisions of Chapter 21 of the Acquis on Regional Policy and the Management of Structural Funds. Of the CEE-10 countries in which such level exists Slovakia is the one where NUTS-2 level cohesion regions are the weakest. It was repeatedly criticized by the European Commission for the extremely slow process of decentralization and regionalization of the country.

The first proposal of the country to create the NUTS system sought to divide the country so that all the established regions be Objective 1 region. This proposal was rejected by the Commission, and Slovakia was required to propose a new division of the country. The result was a new structure in which the Bratislava stays as separate region. There were allegations on the side of Hungarian minority leaders that regions at both the NUTS-2 and NUTS-3 levels were gerrymandered so that ethnically Hungarian regions remain in minority.

Much effort was made to create the necessary institutional administrative capacity to implement regional development policy at the level of ministries. In order to ensure that the highly centralized institutional framework would guarantee the smooth operation of regional policy, an inter-ministerial coordination structure was created. The Council of the Slovak Government for Regional Policy was created, which is supported by the Department of Regional Development.

The fact that regionalization was delayed, counties (NUTS-3) registered their own Regional Development Agencies, which further weakened the enrooting of institutional and administrative capacities at the NUTS-2 level. In conclusion, in the Slovak Republic NUTS-2 level regions have remained weekly institutionalized and administratively underdeveloped even compared to regions in the other CEE-10 countries.

In all the CEE-10 countries where meso-level governments were created, special provisions were made in the legislation to avoid any subordination of local authorities to regional authorities. Similarly, regional authorities are legally protected against central government interventions. Nevertheless, the high dependence of meso-level government on central government transfers and subsidies limits their effort to adopt their own development strategies and indirectly limits overall policy independence. In the same way, local authorities are dependent on meso-level and central government transfers and are seriously constrained by the dominance of ear-marked grants.

6.5 Summary

The initial attempts of the European Commission to influence and standardize regional policy in the CEE-10 countries failed. Given that the requirement to set-up managing authorities at regional level in each country could not be enforced, the European Commission reconsidered its position and started to advocate for the strengthening of central government capacities. The implications of this shift in the accession conditionality were much more acceptable to national policy-makers, and thus,

ministries became the managing authorities for sectoral operation programs, and NUTS-2 level cohesion regions became managing authorities only for the regional development operational programs. This implies that – contrary to what was sought through the initial negotiation position of the EU – the outcome has been the strengthening of national and not regional institutional and policy capacity.

Despite almost unanimous agreement over the importance of European accession conditionalities in the shaping of institutional structures and policy options of the CEE-10 countries, the lack of an EU model of regionalization raised the issue whether limited or sometimes contradicting signals from the Commission and different EU-15 countries could be inducive to the emergence of optimal institutional and policy choices in accession countries. In contrast to the general theory on institutional exporting through accession conditionalities, evidence presented in this chapter has shown that in the field of regional policy the EU has no clear institutional model to promote. Therefore, despite the extensive accession negotiations and the adoption of the *acquis* by the CEE-10 countries in the field of regionalization, there is limited institutionalization at the sub-national level.

In conclusion, the way in which the CEE-10 countries dealt with regionalization seems to the result of the interplay between high political sensitivity for historical regions and the socio-economic structure of the society, on the one hand, and limited and often conflicting signals from the EU during the accession negotiation process, on the other. Carrying out regionalization agendas met, besides a series of technical challenges, a series of resistance, re-awaking historical sensibilities that sometimes were at least equally important in the shaping of the regionalization outcomes as the EU conditionalities themselves. These indicate that the weak negotiation positions of the European Commission and the strong domestic pressures of CEE-10 country decision-

makers led to the national filtering and interpretation of conditionalities and to limited institutional and policy convergence in the field of regional policy.

The administrative reform has led to the creation of a two-layer local government system in the Czech Republic, Hungary, Poland, Romania and Slovakia, in which the higher level has been considered to correspond to the meso-level government tier. Despite these developments, which were often implemented amidst vibrant political debates on the extent of local autonomy and the borders of meso-level government tiers, progress in the field of regionalization was much slower than in Poland. In all the countries the fragmentation of the local government system is exceptionally high, and therefore in most cases the meso-level government tier does not correspond to the standards of cohesion regions.

The lack of congruence between the existing meso-level government structures in the Bulgaria, the Czech Republic, Hungary, Romania, and Slovakia and the cohesion regions (NUTS-2) promoted by the EU led to a situation in which a new level of administrative organization needed to be set up, too. The solution provided by each of the five countries was to maintain their own meso-level governments and set up weak structures by the association of such meso-level governments into cohesion regions.

The re-iteration of historical regions was systematically avoided to prevent any possible strengthening of pressures towards political regionalization, which was considered to directly inflict with the nation state principle applied by all the CEE-10 countries. In none of these countries, with the exception of Poland, was there any real interest in reshaping the existing regional structures or in creating a new layer of governance. Therefore, the creation of cohesion regions was limited to administrative regionalization. The minimal approach adopted by all the CEE-10 countries (with the notable exception of Poland) in complying with the territorial organization

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requirements of the EU led to the adoption of the three-level hierarchy of NUTS system based on the size of the country and without creating a directly elected and autonomous government tier, or in some cases without considering historically defined economic areas at the level of cohesion regions.

In the interpretation of the CEE-10 countries, the obligations deriving from the requirement of setting up sub-national territorial divisions were strictly limited to the necessary administrative capacities to collect regional data according to the NUTS system in a standardized way.

Chapter 7. Convergence Processes in the CEE-10 Countries

7.1 Introduction

This chapter has the objective of verifying the convergence hypotheses and the methodology related hypothesis (formulated in the third chapter) through regression analysis following the lines of the classical convergence literature of regional per capita income growth processes. The aim is to verify whether the provisions of the literature are tested in the case of the CEE-10 countries, namely that lagging regions in the CEE-10 countries that joined the EU in 2004 and 2007, respectively, are catching up with the leading regions, considering their newly created institutional and policy context. Contrary to most analysis, I avoid using the EU-15 average as benchmark; instead, I focus on the extent to which the regions at the highest local authority level (NUTS-3) and the cohesion region level (NUTS-2) in the newly democratized countries are becoming more homogeneous in terms of per capita GDP given increasing levels of decentralization, trade liberalization and technological development.

The choice is motivated by the fact that the main objective of this dissertation is to analyze whether the different NUTS-3 and NUTS-2 levels benefit similarly from the increasing elimination of government imposed restrictions and the process of increasing economic integration in the larger European economic space under different institutional and policy structures.

Per capita GDP income growth rates were selected as the main measure of territorial inequality for several reasons. First, in a recent paper Mulligan et al. (2004) after testing for sixty-seven different possible measures of inequality among economies found that initial levels of income to be among the top correlates for long-run growth, along with regional dummies, the relative price of investments, human capital and health variables. A second reason for which I selected per capita income instead, for instance production function approach, relates to data quality concerns. In most CEE-10 countries there are important statistical breaks in time-series data, which makes the results of both long-run and cross-country regression analysis to be unreliable and misleading. The third reason is that per capita GDP expressed in PPSs controls for a series of domestic variables related to price differences, and it is also comparable to EU-15 countries data.

Before proceeding with the empirical analysis, I need to warn about several important potential drawbacks of the methodology used in the following analysis, which motivate the robustness tests to be used to verify the validity of results. The main methods used in the analysis are ordinary least square and quantile regression. The weaknesses of ordinary least square are summed-up by Pritchett (2006) who, discussing empirical growth research, identifies two stances in applying growth regressions. The first approach investigates the correlation between growth rates on the one hand, and a series of different explanatory variables on the other hand. The author identifies a set of five sources of weaknesses of this approach. The first weakness relates to the results produced by partial correlations, namely associations among variables, which do not explain the causes of the identified association. The second challenge is to reconcile different evidence from the micro and macro levels. The third one relates to the impossibility to explain the variance of explanatory factors among countries. Forth,

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growth regressions are insensitive to growth episodes, which make them vulnerable to underscoring growth volatility rates. Last but not least, the somewhat limited empirical relevance of growth regressions as a policy instrument can be mentioned.

The second approach to growth regression focuses on evaluating the determinants of output level. In this approach, emphasis falls on the role played by various institutions in producing different long-run per capita GDP income growth performances in the economies under analysis. In this approach, it is hypothesized that income levels in a given economy are directly determined by the quality of institutions in place. For instance, Rodrik et al. (2004) in their regression analysis find that the quality of institutions is a statistically significant explanatory factor for long-run per capita GDP income growth.

This chapter is divided into seven sections. Following the introductory section, I continue with the analysis of per capita income convergence processes at country level by analyzing unconditional convergence and building a model for testing the hypothesis according to which macro-economic factors are responsible for inducing growth. This is followed by testing the unconditional β-convergence hypothesis using pooled ordinary least square (OLS) at the NUTS-2 and the NUTS-3 levels for all CEE-10 countries. In section three, I verify the conditional convergence hypothesis by using least square dummy variables to control for country fixed effects and estimate the distance of individual country group regions from the average group effect. After characterizing sub-national β-convergence/ divergence processes, in the following section I proceed to analyze σ-convergence across the CEE-10. Building on the results of the tests, sections five and six include two alternative modeling strategies to enhance the explanatory power of the convergence/ divergence analysis in the case of the regions and countries under focus. These modeling strategies are the testing for the

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presence of convergence clubs and quantile regression analysis. The last section is the
summary of those discussed in the chapter.

7.2 Testing unconditional β-convergence

Following the neo-classical approach popularized by Sala-i-Martin and Lee Barro
(1991, 1992), unconditional *β-convergence* is considered to occur when a negative
relationship is observed between the initial income levels and the annualized income
growth rate. This supposed negative relationship implies that on average regions with
lower levels of per capita income are expected to have a higher income growth rate
compared to regions with higher initial income levels.

The most straightforward unconditional convergence model can be tested by
pooled regression estimates using OLS. By assuming homogeneous intercept and slope
coefficients, it is supposed that regions converge to the same steady state. The constant
coefficient model could be stated as follows:

$$y_{it} = \alpha + \alpha_1 x_{it} + \varepsilon_{it} \qquad\qquad (1)$$

where y_{it} denotes the log of per capita average growth rate of income measured
in PPS (purchasing parity standard) for each region (i) over period (t). The subscript
i denotes the cross-section dimension of the data ($i = 1,\ldots,N$), and t denotes the time-
series dimension of the data ($t = 1,\ldots,T$). The income growth rate is calculated by
taking the log of GDP for the last year divided by the initial year of the period, which
can be formally stated as: $y_{it} = \log(GDP_{i,t}/GDP_{i,0})$. Variable x_{it} contains the log of per
capita GDP for the initial year. α is the intercept that is similar for all regions, α_1 is
the slope coefficient in the model and ε_{it} is the error term. To obtain the annualized

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convergence rate some calculations are needed for which the following formulation is used: $\beta = -\ln(1-\alpha_1)/t$.

Similarly to the findings in the general literature (Wagner and Hlouskova, 2005), regression analysis provides evidence that in the period 1991-2005 the CEE-10 region experiences per capita GDP income divergence. The annual rate of unconditional β-divergence among the CEE-10 countries was 1.23%, significant at the .001 level, which implies a doubling of the existing per capita GDP disparities in 56 years. These findings seem to infirm the cross-country convergence hypothesis, which might be surprising if one considers that all countries were exposed to similar conditionalities regarding the implementation of institutional and policy reforms prior to their EU accession. A possible interpretation of these results could be related to the various phases of the reform processes that were carried out in the region.

Therefore, I divide the whole period into three sub-periods according to the major phases of the implementation of adjustment policies. The first sub-period covers the years 1991-1995 and corresponds to the phase of fundamental political transformations, democratization and the adoption of early macro-stabilization policies. The second sub-period (1996-2000) captures the measures seeking to deepen and further consolidate the newly created democratic and open institutions. The third sub-period, starting with the year 2001, corresponds to the phase of comprehensive institutional reforms that can be related to a large extent to the EU accession negotiations and the requirement to adopt the full acquis communautaire and to adjust national policies to the EU standards.

The annualized per capita GDP income growth rates for the whole period 1991-2005 and the three sub-periods identified were presented in table 10. The table shows important growth volatility both between and within countries.

Table 15 presents the results of the regression analysis for the CEE-10 countries over the period 1991-2005. This shows, as discussed above, per capita GDP income divergence among the CEE-10 countries for the entire period with differences doubling every 56 years. Divergence is also observed for each of the three sub-periods described above. Thus, while in the sub-period 1991-1995 the annual rate of per capita income divergence among the CEE-10 countries was 5.79%, which implies a doubling of differences every 12 years, in the sub-period 2001-2005 the rate of divergence was somewhat slower, of about 3%, which implies a doubling of disparities every 24 years. These country level results are statistically significant at .001 level. However, the explanatory power of the simplex unconditional β-model is limited. For the sub-period 1996-2000 the regression results are not statistically significant.

Table 15. Unconditional β-convergence				
				CEE-10 countries
	1991-2005	1991-1995	1996-2000	2001-2005
Intercept	2.445 (-4.51)****	2.906 (5.73)****	.369 (1.61)	1.73 (10.90)****
α_1	-.203 (-4.51)****	-.335 (-2.29)****	-.014 (-0.54)	-.160 (-2.34)****
Adjusted R^2	0.10	0.16	0.00	0.33
β	**-1.23**	**-5.79**	**-.28**	**-2.93**
Half-life	-56	-12	-2.49	-24
F-statistics	20.38****	33.59****	0.30	5.49****
Root MSE	.17	.21	.11	.07
N	17	17	17	17

Statistical significance at: * p<10, ** p<.05, *** p<.01, ****p<.001

The individual annualized per capita GDP growth performance for each CEE-10 country is presented in Figure 9. The figure shows that Slovenia, the country with the highest per capita income level (EUR 9,520 in PPS) in the year 1991, and Romania, the

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country with the lowest per capita income (EUR 4,100 in PPS) in the same year, registered almost identical annualized growth rates in the period 1991-2005. This indicates neither convergence, nor divergence among these two countries. In contrast, in the case of Poland and Estonia income convergence seemed to be taking place if compared to the top-ranking countries. However, in the case of Bulgaria, one of the bottom-ranking countries, the low annualized growth performance indicates increasing divergence if compared to the top-ranking countries.

Figure 9. Annual per capita growth rate, period 1991-2005
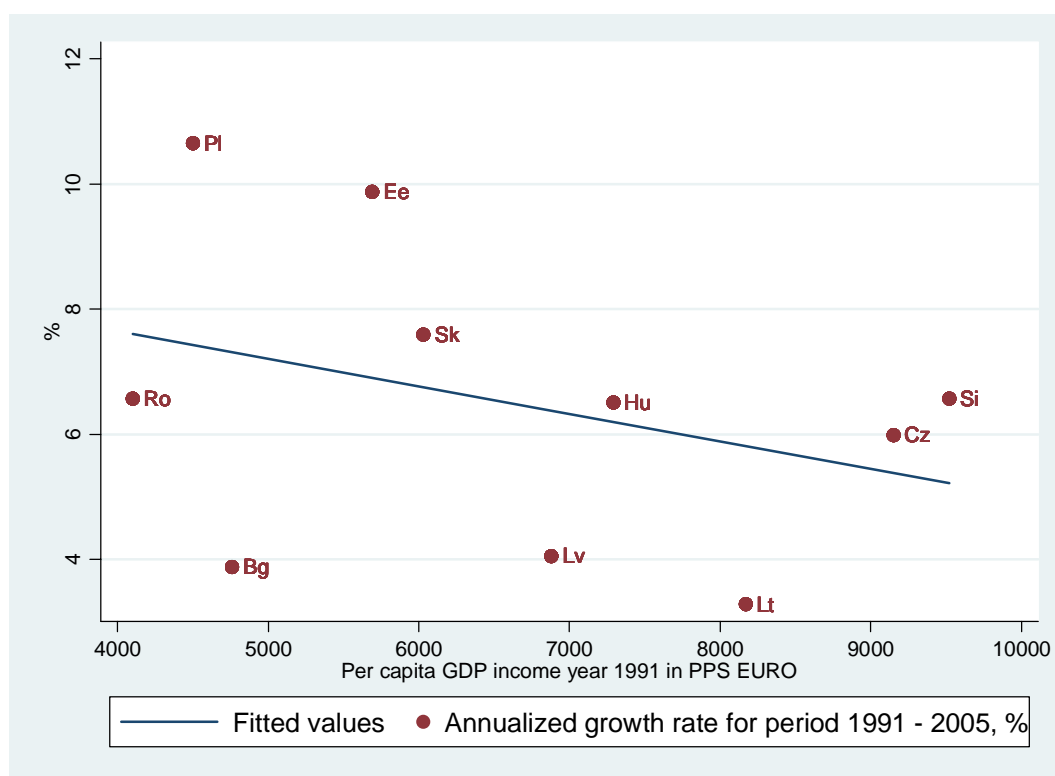
Besides showing overall increasing cross-country income disparities, these findings also raise the issue of whether these economies approach different steady states or they approach comparably similar steady states but at different pace. These possibilities are supported also by the findings for the three sub-periods under study.

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While the first sub-period (1991-1995) shows the largest level of disparities, the third sub-period (2001-2005) shows significantly lower levels of disparities.

When considering the different country experiences in what regards the scale and timing of the fundamental macro-economic stabilization policies, we observe different growth performances. Figure 10, although highly significant (at the level .001), draws attention to the rather weak explanatory power of the model for the period 1991-1995. Nevertheless, figure 10 – besides showing significant "transformational recession" in the early transition period – is informative about the extent of growth recession but also about the different growth performances of the countries. The figure shows that Poland registered the highest positive annualized growth rate (7.2%). Romania (2.54%) ranks second, closely followed by Slovakia (2.45%) and the Czech Republic (1.80%). Hungary (.49%) and Slovenia (.40%) registered almost no growth, while Bulgaria (-.04%) experienced a slight fall. Significant negative growth performance rates were registered by the Baltic States, especially by Lithuania (-7.69%) and Latvia (-6.80%), although similar levels of macro-stabilization steps were undertaken as in the countries with the highest growth rates.

Poland, being one of the leading shock therapy adopters, registered the highest annual per capita income growth rate in spite of the fact that it was among the countries with the lowest initial per capita income. In contrast, Romania (EUR 4,470), with a very similar initial per capita income level to that of Poland (EUR 4,610), had a considerably less impressive recovery. It is worth mentioning that while Poland was among the leaders of reformers, Romania opted for a more gradual approach to reform. Nevertheless, if compared to Bulgaria, which had a similar per capita income level at the beginning of the period, Romania's performance was slightly better. Comparably high levels of state-owned enterprise privatization, trade and price liberalization in the

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cases of the Czech Republic, Hungary and Slovakia are related to similar levels of per capita income growth. However, these countries were outperformed by Romania. All these suggest that when comparing the per capita income of 1991 to that of 1995 the different growth rates widened income differentials among countries.

Figure 10. Annual per capita growth rate, period 1991-1995
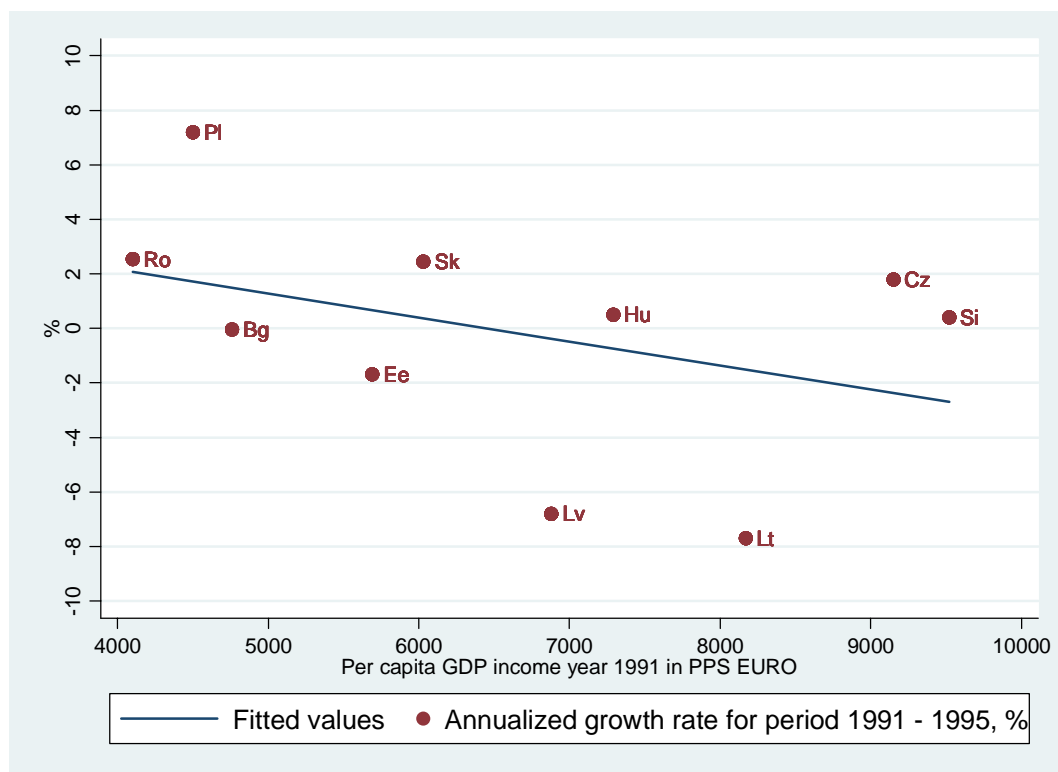
In the case of the sub-period 1996-2000, when steps toward deepening the macro-economic reforms were taken, no systematic relationship could be observed among the growth performances of the CEE-10 countries. Yet, the data in figure 11 show that without exception all countries performed better compared to the previous sub-period (1991-1995), and none of the countries registered per capita income fall. This, according to the theory already discussed earlier, could be to a certain extent attributed to the reforms that were already carried out by that time. Despite this shift towards growth in each of the CEE-10 countries, several peculiar processes can be

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noted. First of all, Romania (.16%) and Bulgaria (3.90%) took the place of the Baltic States, becoming the absolute laggers in the region as they implemented major reforms in this period. What is somewhat surprising is to find the Czech Republic (2.56%) among the countries with low per capita income growth rates. In contrast, the Baltic States (Estonia 9.98%, Latvia 8.54%, and Lithuania 6.97%) joined the group of the forerunners in the previous period, namely Poland (7.41%) and Slovenia (6.07%). This group with high growth rate includes both countries with low and countries with high per capita income. But Hungary (6.71%) and Slovakia (5.56 %), even though they registered considerable growth performance, were caught-up and even outperformed by the Baltic States.

In the sub-period 1996-2000 all countries, with the exception of Romania, moved to a growth path or accelerated their growth rate from the previous period. The least volatile growth path was registered by Poland, which succeeded in maintaining a more than 7% annualized growth rate over the two periods, with an even slight acceleration in the second period. A similar steady growth can be observed in the case of the Czech Republic, but around the score of 2% per year. The Baltic States, which all registered a significant per capita income fall in the period 1991-1995, successfully reversed this trend, and what is more, they became the leaders of growth in the period 1996-2000. Slovenia, Slovakia and Hungary all accelerated their growth rate, but their scores remained below that of Poland.

As a result of the per capita GDP income growth performance of the Polish economy, Poland moved up from the ninth ranking at the beginning of the previous period to the fifth by the beginning of 1996.

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Figure 11. Annual per capita growth rate, period 1996-2000
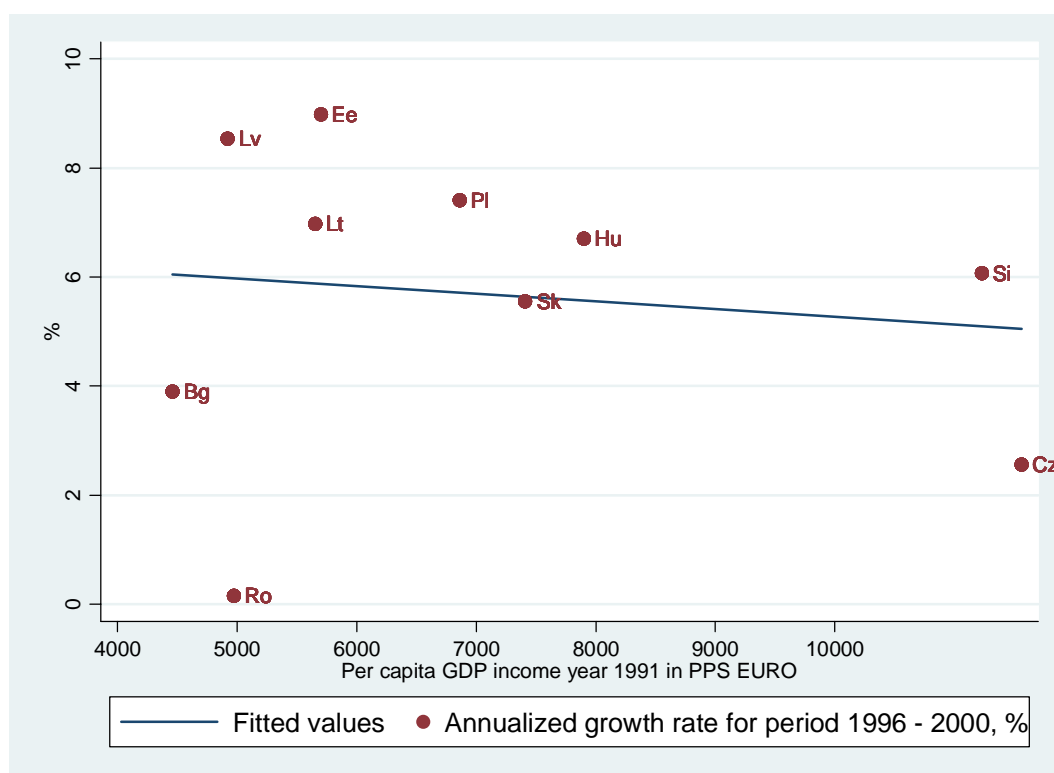
Figure 12 indicates that the process of unconditional per capita GDP income divergence among the CEE-10 countries was not reversed in the period 2001-2005. Nevertheless, growth acceleration remained robust as all countries enhanced their performance. Both Bulgaria and Romania accelerated their growth rate and managed to catch-up with and slightly surpass the group including the Czech Republic, Hungary and Slovakia. Within this latter group the Czech Republic was outperformed by the other two countries. At the same time, Slovenia lost its position among the leading countries in terms of growth. The Baltic States, especially Latvia and Lithuania, achieved exceptional performance, becoming the absolute leaders in the region in what concerns per capita GDP growth.

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Figure 12. Annual per capita growth rate, period 2001-2005
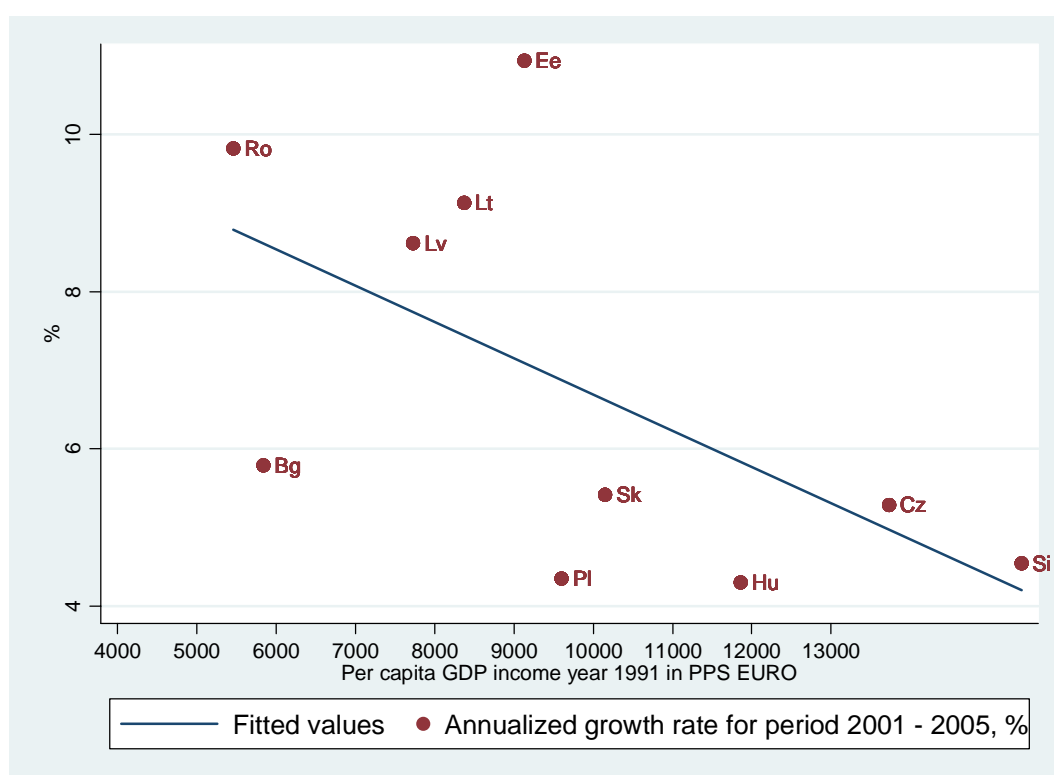
In terms of per capita income, Slovenia and the Czech Republic remained the leaders in the region, while at the other end Romania remained the lagger. In this period we observe that while Poland, Hungary and Slovenia registered slower average growth rates than in the previous periods, the Baltic States maintained their sustained growth, and Romania and the Czech Republic registered important increases in their growth rates.

In the next step, the pooled OLS models and the fixed effect models are estimated at both planning region (NUTS-2) and county or district levels (NUTS-3), and for three time periods, namely 1995-2004, 1998-2004 and 2001-2004 respectively. The rationale for selecting these different periods is to ensure that reasonable controls of the unbalanced nature of the panel are introduced without needing to generate data. Thus, for instance, the estimates of the pooled OLS regressions referring to the period 1995-2004 exclude Romania altogether from the analysis due to lack of comparable

data. For easier reading, I introduce special short-hand notations for the six pooled OLS regression models that are estimated, more precisely:

- OLS-NUTS2A – covers the period 1995-2004 at NUTS-2 level with missing data for all Romanian regions for the period 1995-1997.

- OLS-NUTS2B – covers the period 1998-2004 at NUTS-2 level with data for all CEE-10 countries being available.

- OLS-NUTS2C – refers to the period 2001-2004 at NUTS-2 level with data available for all CEE-10 countries.

- OLS-NUTS3A – covers the period 1995-2004 at NUTS-3 level, with missing data for Romania for 1995-1997, Hungary for the year 2000, and the following Polish counties: Warszawski, Miasto Warszawa, Czestochowski, Bielsko-Bialski, Centralny Slaski, Rybnicko-Jastrzebski for the period 1995-1999.

- OLS-NUTS3B – covers the period 1998-2004 at NUTS-3 level with missing data for Hungarian counties for the year 2000.

- OLS-NUTS3C – refers to the period 2001-2004 at NUTS-3 level regions with data available for all counties in all CEE-10 countries.

The results of all six pooled OLS models, presented in table 16, indicate highly significant F-test scores and robust *t statistics* for the periods 1998-2004 and 2001-2004. In terms of variance, in the case of the two NUTS-2 level models, the initial level of per capita GDP accounts for negligible amounts of the variance in per capita income growth rate over the periods 1995-2004 and 1998-2004, while in the case of the period 2001-2004 it accounts for 13% of all variance.

In the case of the three NUTS-3 level models, estimations produce highly statistically significant results for all three periods under study. Regarding variance, we

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observe improvements over all three periods. Thus, while at NUTS-2 level for the period 1995-2004 the model accounts for almost zero per capita income growth, in the case of NUTS-3 regions it captures 8%. In the case of the period 1998-2004, the model at NUTS-3 level captures nearly 19% of all variance, while the estimation covering the period 2001-2004 accounts for about 15% of per capita income growth. Similarly, T-test scores, reported in parentheses, are also statistically significant.

Table 16. Pooled regression model for NUTS-2 and NUTS-3 level data

	NUTS-2			NUTS-3		
	1995-2004	1998-2004	2001-2004	1995-2004	1998-2004	2001-2004
Intercept	.228	.599	.783	.964	.809	.918
	(1.47)	(6.70)***	(11.91)***	(-11.41)***	(36.97)***	(22.98)***
α_1	.033	-.027	-.066	-.01374	-.013	-.081
	(1.85)*	(-2.69)***	(-9.04)***	(-11.41)***	(-20.60)***	(-18.01)***
Adjusted R^2	0.00	0.01	0.13	0.08	0.19	0.15
β	**.33**	**-.38**	**-1.59**	**-.14**	**-.18**	**-1.94**
Half-life	208	-181	-44	-508	-381	-36
F-statistics	3.44*	7.26***	81.64***	130.24***	424.55***	324.44***
Root MSE	.13	.09	.07	.15	.10	.09
N	45	53	53	142	190	190

Note: the NUTS-2 and NUTS-3 series 1995-2004 exclude observations on Romania.
Statistical significance at: * p<10, ** p<.05, *** p<.01

In the case of NUTS-2 level regions the models covering the periods 1995-2004 and 1998-2004, respectively, do not provide any better prediction for the value of the annual growth rate of regions than the mean value of the annualized growth rate. In contrast, in the case of the NUTS-2 level analysis covering the period 2001-2004 and all three NUTS-3 models the simplex model produces variance estimates that are systematically different from the results produced by mean based variance estimation. Thus, for the period 2001-2004 the OLS model at NUTS-2 level explains 13% of the

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variance in annualized per capita income growth rates, while the OLS model at NUTS-3 level explains 15%. The model with the best explanatory power is at NUTS-3 level for the period 1998-2004, as it explains 19% of the variance in annual growth rates. These results are comparable to the results obtained in the general literature using similar regression estimation strategies. The differences are also highly statistically significant, which indicates that the results are robust.

The coefficient for the initial level of regional per capita GDP indicates that for one unit increase of per capita GDP income a 3.3% increase of regional per capita GDP income growth for the period 1995-2004 is observed at the NUTS-2 level. Yet, if considering a shorter time period (1998-2004) and including Romanian regions among the sample NUTS-2 regions, a decrease of the growth performance to a value of .92 is observed, and if considering the period 2001-2004, this further decreases to .72. Restated, this implies that in the case of the regions in the nine countries there is divergence instead of income convergence over the period 1995-2004, which is expressed by the negative sign of β. In contrast, if we include Romanian regions in the sample of NUTS-2 regions and reduce the period under analysis, the sign of β changes, indicating unconditional convergence at an annual rate of 2.5%, while if we consider only the period 2001-2004, a stronger 3.17% convergence is obtained.

Looking at NUTS-3 level data, the results become even less convincing as the findings of the pooled OLS regression indicate that one unit of increase in per capita GDP leads to a nearly eight-unit increase in per capita income growth rate. Last but not least, the full sample for the period 2001-2004 indicates absolute divergence in the sense that one unit increase of initial per capita GDP implies a 0.08 decrease of annual growth rate over the period. At this stage, the results of these regressions suggest that the level of aggregation of the data used in the analysis combined with the different

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time periods considered strongly influence the estimation results. In the case of the NUTS-2 OLS regression models the reasons for the change of the signs of the convergence estimates are mostly attributable to the fact that Romanian regions are among the lagging ones in terms of per capita income, and therefore they contribute to the heterogeneity of the cross-section.

The plot format representation of the six pooled OLS regression results (see figure 13) reiterates the important differences that can be observed in the case of the intercepts for both NUTS-2 and NUTS-3 level data and also the differences for the two NUTS-3 level OLS models. Furthermore, one could observe that data points in each of the six plots are far away from the other ones, which suggests the need to carry out regression diagnostics to verify whether the data used in the analysis meet the assumptions of ordinary least square regression.

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Figure 13. OLS scatterplots with fitted values
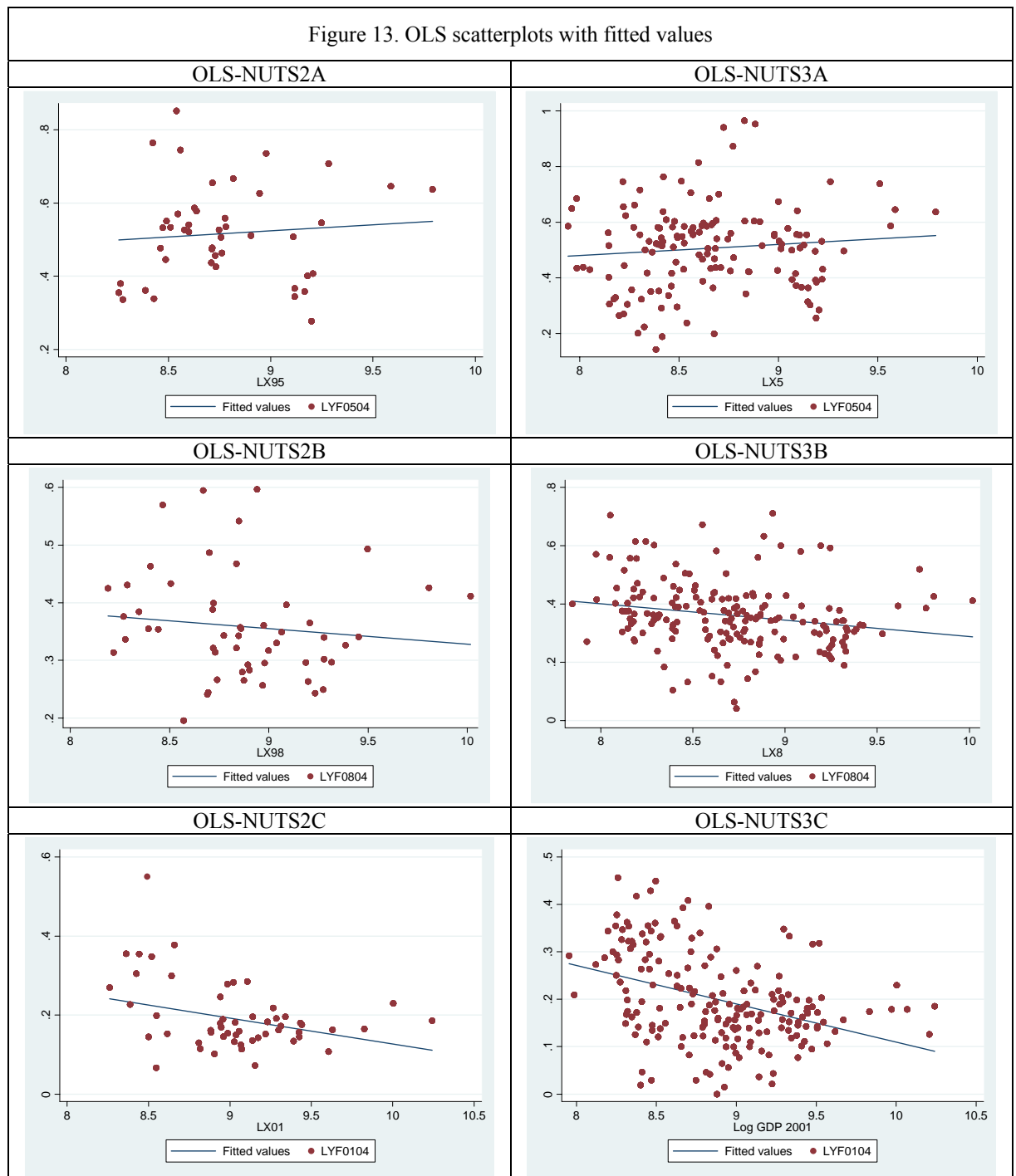
In the introductory section of this chapter I already mentioned the potential weaknesses of ordinary least square in the context of the summary by Pritchett (2006). To evaluate the potential weaknesses of OLS that follow from the assumptions of OLS regression analysis (i.e. linearity, normality, homoscedasticity, independence and model

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specification) is of special importance as the vast majority of findings reported on cross-country growth regression build on this method, and therefore they all are potentially subject to the same type of problems. In the following, I propose to analyze whether the assumptions on which OLS regression builds are valid in the case of the growth of the CEE-10 countries.

Before verifying each of these assumptions, the issues of variable transformations and influential data need to be discussed. I propose to shortly discuss the choice of using log-normalized data instead of raw data. This choice is supported by two reasons. First, I discuss these transformations from the perspective of the validity of operation in light of enhancement in the normal distribution of regression residuals. Second, it is important to address the normal distribution of variables in view of applying quantile regression. Considering these, it is useful to recall that one of the fundamental assumptions of linear regression is that regression residuals are normally distributed. The non-normal distribution of residuals can be linked to the non-normal distribution of independent variables. For this reason, I first look at the extent to which per capita GDP incomes for the period 1995-2004 are normally distributed at NUTS-3 level in the case of the CEE-10 countries.

There are several alternative ways to evaluate and visualize the distribution of the variables and thus to assess the extent of normal (Gaussian) distribution, including the histogram approach (indicating the distribution of the variables compared to the expected Gaussian distribution), the Kernel density plots (approximating the probability densities for the variables), the symmetry plots (visualizing the distance above the median of a given value to the distance below the median), the normal quantile plots (showing the actual quantiles compared to the quantiles of the Gaussian distribution), and the normal probability plots (showing the deviation from normality of the

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distribution near the center). The distributions are reported in the histogram graphical form in figure 14, which shows that per capita GDP incomes are non-normally distributed as the number of lower income regions is much higher, while the high per capita income regions are lower in number than it would be expected in the case of normal distribution. The graph shows that for every year the distribution is skewed to the right. Per capita GDP income for all three periods is non-normally distributed.

Figure 14. Normal distribution of per capita GDP income
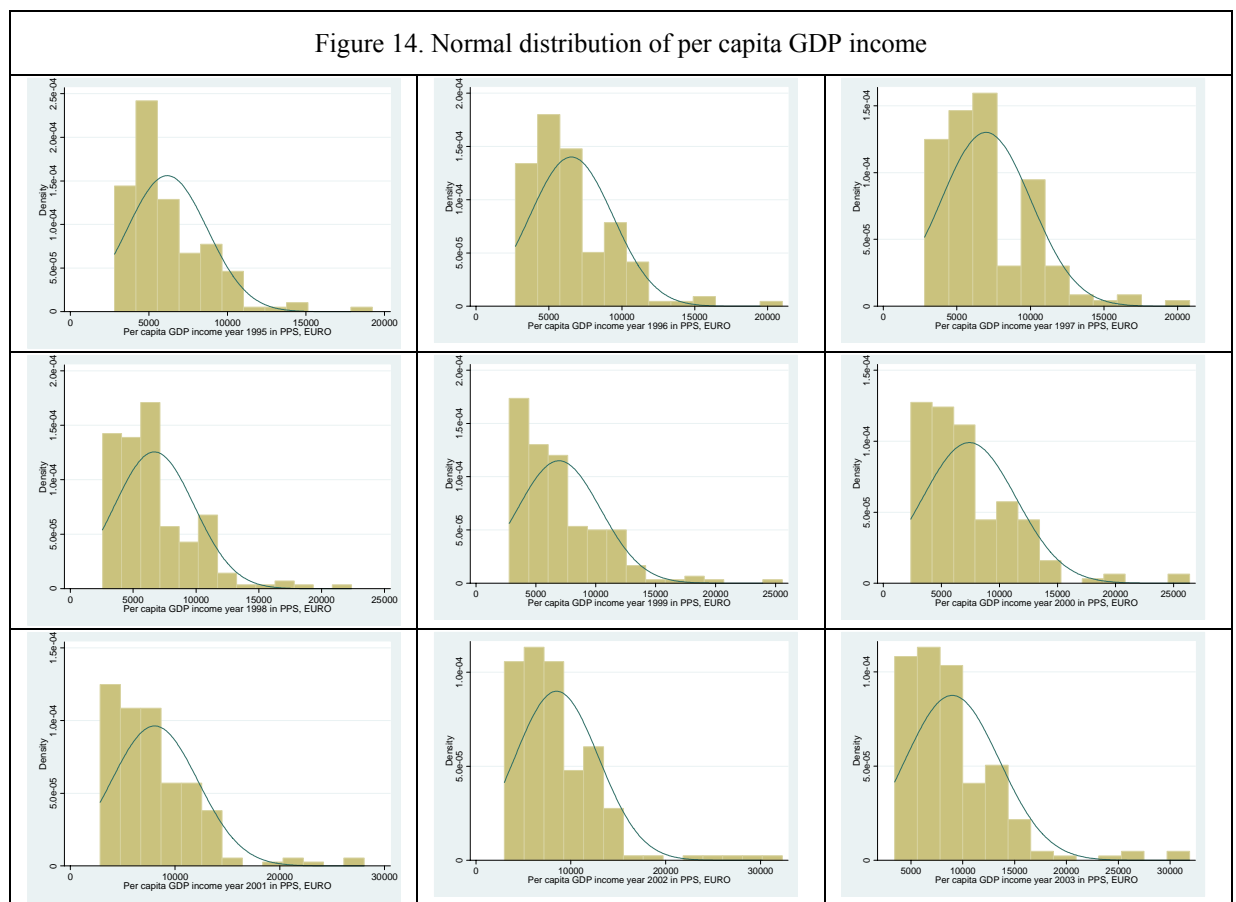
A generally tried and tested method to potentially enhance the effectiveness of regression analysis is to transform variables so that their normal distribution be improved. There are several possible criteria (the chi-square, the Andersen-Darling or the Kolmogorov-Smirnov goodness-of-fit tests) that can be used to select the most

effective data transformation. From among these goodness-of-fit measures the most often used one is the chi-square.

The chi-square goodness-of-fit measure tests the null hypothesis of normal distribution and in the data transformation case shows the extent to which different operations with the data enhance normal distribution or not. According to this principle (where the raw values are also included) from among some of the possible transformations the one producing the smallest chi-square is selected. According to the results, reported in table 17, in the case of GDP 1998 and GDP 2001 log transformation has the smallest chi-square, while for GDP 1995 the smallest chi-square can be observed in the case of the reciprocal root. These suggest that although in some cases log transformation would indeed make per capita GDP income be more normally distributed, this transformation cannot be applied automatically to any data without prior checking for the performance of the different possible transformations. The performances of the different transformations are also visualized in the appendix (figures 25-27).

Table 17. Chi-square tests for variable transformations							
		GDP 1995		GDP 1998		GDP 2001	
Transformation	formula	chi2(2)	P(chi2)	chi2(2)	P(chi2)	chi2(2)	P(chi2)
cubic	GDPx^3	.	0.000	.	0.000	.	0.000
square	GDPx^2	.	0.000	.	0.000	.	0.000
raw	GDP98	36.74	0.000	50.50	0.000	66.00	0.000
square-root	sqrt(GDPx)	16.44	0.000	19.84	0.000	27.50	0.000
log	**log(GDPx)**	**5.15**	**0.076**	**5.23**	**0.073**	**4.99**	**0.082**
reciprocal root	1/sqrt(GDPx)	2.64	0.268	8.07	0.018	7.86	0.020
reciprocal	1/GDPx	3.62	0.164	8.78	0.012	9.02	0.011
reciprocal square	1/(GDPx^2)	22.29	0.000	27.96	0.000	36.32	0.000
reciprocal cubic	1/(GDPx^3)	47.95	0.000	61.99	0.000	.	0.000

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The results of table 17 are visualized in figure 15, where the normal distribution of the log transformed independent variable (per capita GDP income) shows a significant improvement if compared to the raw data presented in figure 14. As a conclusion, log-normalized data is applied as it significantly improves the distribution of data and enhances the normal distribution of data.

Figure 15. Log-normal distribution of per capita GDP income
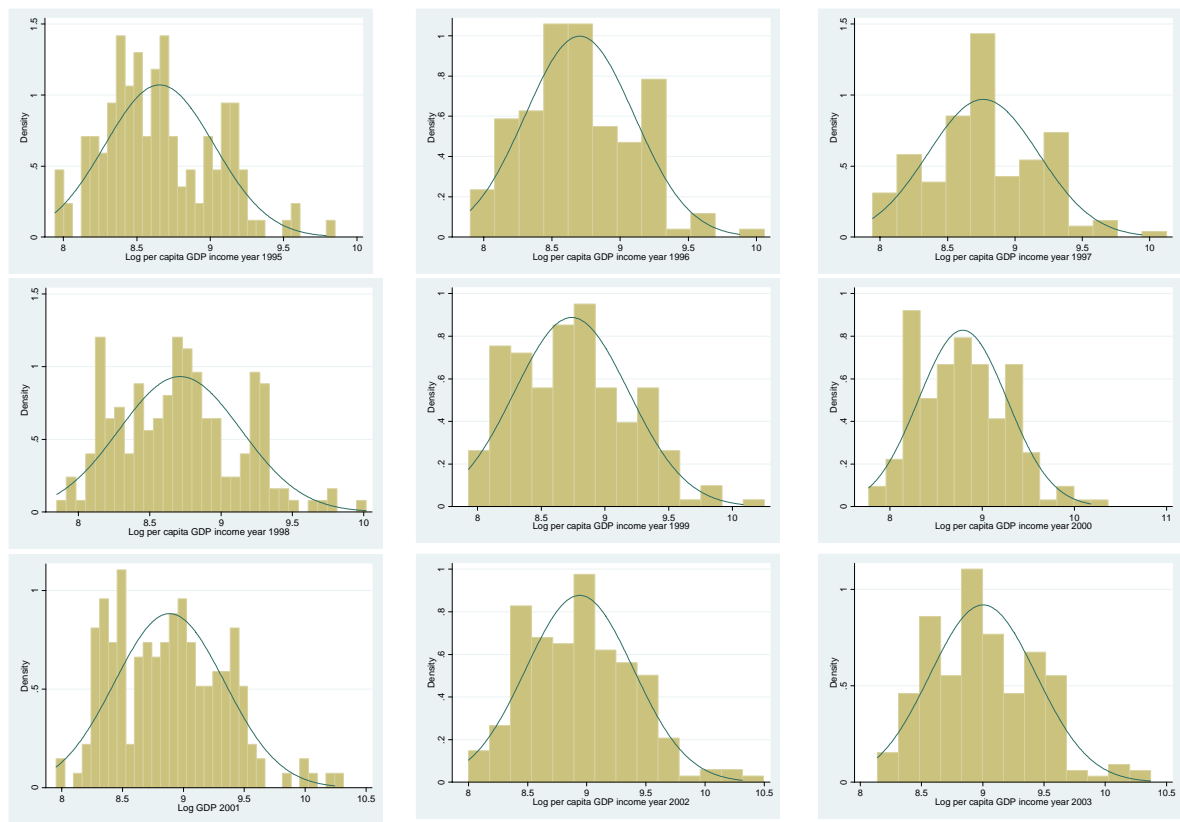
The second issue concerns the need to avoid misleading interpretations of the regression results, for which it is of potentially great importance to discuss the extent to which there are observations in the dataset that exert excessive influence on regression coefficients. The presence of one observation or a small number of observations that take values which are largely different from other observations in the dataset could produce considerable differences in regression results. For this purpose, I propose to

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shortly analyze the dataset and look into three possible ways of verifying whether the dataset contains unusual and/ or influential data. First, I verify whether the dataset contains any outliers or cases with large residuals. After this, I check whether there are observations of initial per capita GDP income that have a large leverage or highly deviate from the mean. Third, if outliers and observations with high leverage are observed, then there might be observations that are influential and once these are removed, substantial changes in the coefficient estimates could be expected.

In order to identify outliers (observations with extremely large residuals), I propose to scrutinize the studentized variant of standardized residuals of the OLS regression. For this reason, after running each regression studentized residuals are generated. The expectation is that studentized residuals take a normal distribution (mean equal to 0 and variance 1), implying that no more than 5% of the residuals exceed the absolute value of 1.96 and less than 1% exceed the value of 3.

The analyses of the studentized residuals for each of the three OLS regressions at NUTS-3 level indicate the presence of some outliers and that their share exceeds the acceptable margin of 5%. This reiterates the earlier finding that the residuals do not take a normal distribution even for the case of log-transformed variables. Thus, for the period 1995-2004 eight of the 142 observations, for the period 1998-2004 fifteen of the 184 observations and for the period 2001-2004 fourteen of the 190 observations had large standardized residuals. Potential outliers include the values that exceed +1.96 or -1.96. Even more important are the cases that exceed +2.5 or -2.5, which can be observed in the case of Riga (Latvia), Vilniaus (Lithuania), Pohja-Eesti (Estonia) for the period 1995-2004 (see figure 16). Other high values are observed for Sliven (Bulgaria) and Komárom-Esztergom (Hungary).

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Figure 16. Leverage versus residual square plot of per capita GDP
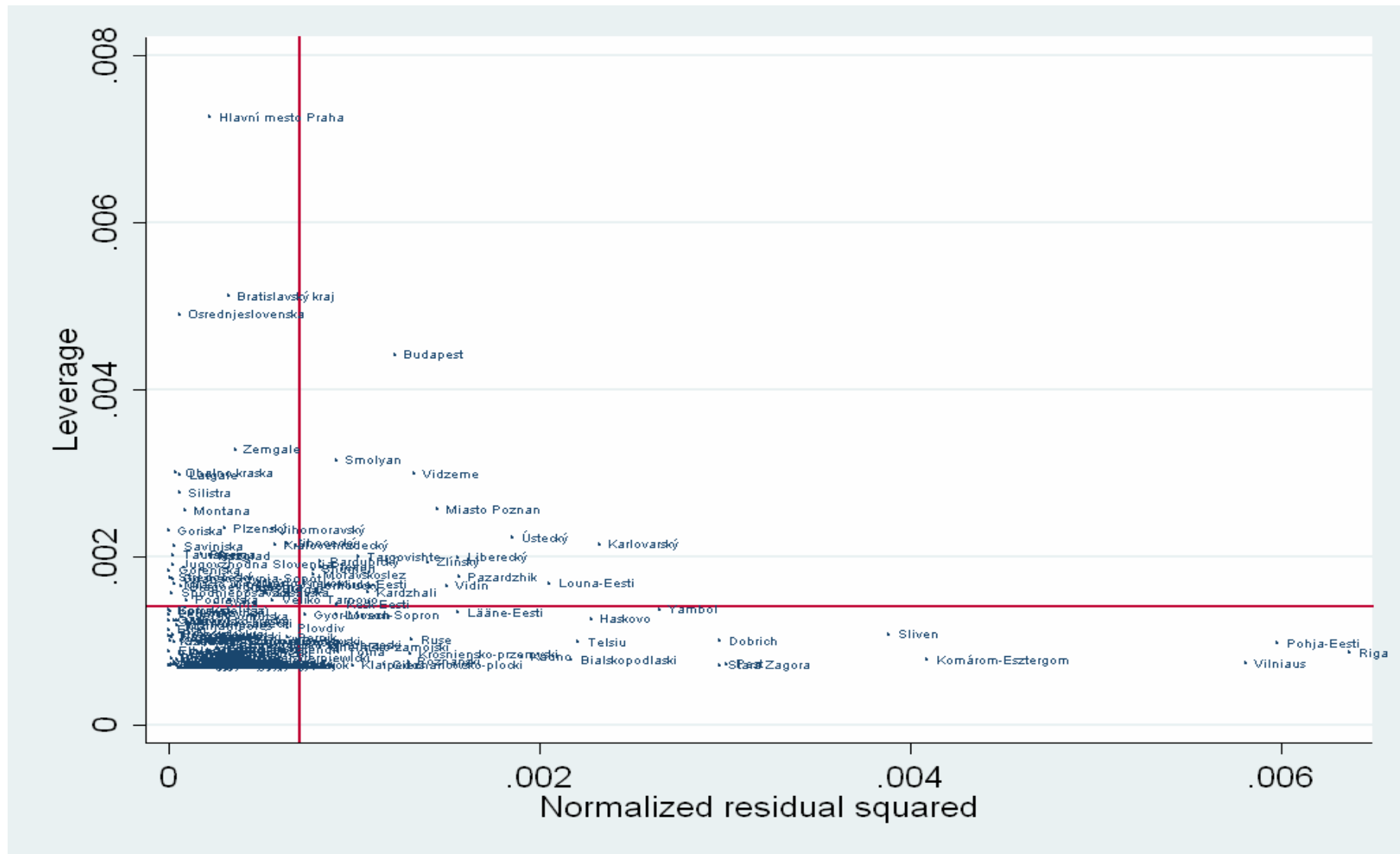
As indicated in figure 17 (all values shown in table 37 in the appendix), for the period 1998-2004 extreme values (above ± 3) are observed only in the case of Komárom-Esztergom (Hungary). Values above ± 2.5 are observed for Bialskopodlaski and Krosniensko-przemyski in Poland, and Timis and Suceava regions in Romania. Large standardized residuals are observed also in the case of five capital cities, namely Sofia (Bulgaria), Riga (Latvia), Vilnius (Lithuania), Pohja-Eesti (Estonia), and Bucharest (Romania).

According to table 37 (in the appendix), visualized in figure 16, in the case of the NUTS-3 regression covering the period 2001-2004 there are neither severe outliers (with values above ± 3), nor cases with values above ± 2.5.

After verifying the values of each outlier, no data entry error was identified. Therefore, despite the fact that the presence of outliers negatively influences the regression estimates, the decision was made not to eliminate any outlier. This is motivated by the facts that eliminating a few regions from the sample cannot be sustained theoretically and that the differences existing among regions are possible indications of other factors which could be modeled in order to explain the different growth behavior of the regions. For instance, observing that most capital cities are among the outliers is a potential indication of some systematic difference in their growth processes compared to the other regions.

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Figure 17. Leverage versus residual square plot of per capita GDP

After assessing the extent to which different outliers are present in the datasets, in the next step I propose to verify whether in the datasets there are observations that are highly influential or have a high leverage. The interpretation of leverage points from the perspective of their influence on parameter estimates and test results needs to be treated with caution as, contrary to common belief, not the presence but the nature of the relation between the observations of the independent and the dependent variable is of great importance. Therefore, leverage points for which the specific relationship between the independent observation and the dependent observation is similar to that in the case of the whole dataset are likely to improve the parameter estimation, so they are considered good leverage points. In contrast, when the specific relationship between the high leverage observations is markedly different from the rest of the dataset it is likely that these observations bias parameter estimation, and therefore are considered to be bad leverage points. The extent of the influence that an observation could have on the model of analysis varies between zero and one.

To determine the presence of leverage points in the NUTS-3 level datasets, the general rule of $2(k+1)/n$ is used to find observations with a high leverage, and the $3(k+1)/n$ rule is applied to find the highest leverage point. The threshold leverage values calculated for each of the three NUTS-3 level regressions are: .028169 and .04225352 for the period 1995-2004, 0.0217391 and .03225806 for the period 1998-2004, and .0210526 and .0315789 for the period 2001-2004. In the period 1995-2004, from 142 observations, a number of nine high leverage points were identified (see figure 18).

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Figure 18. Leverage versus residual square plot of per capita GDP

Period 2001-2004
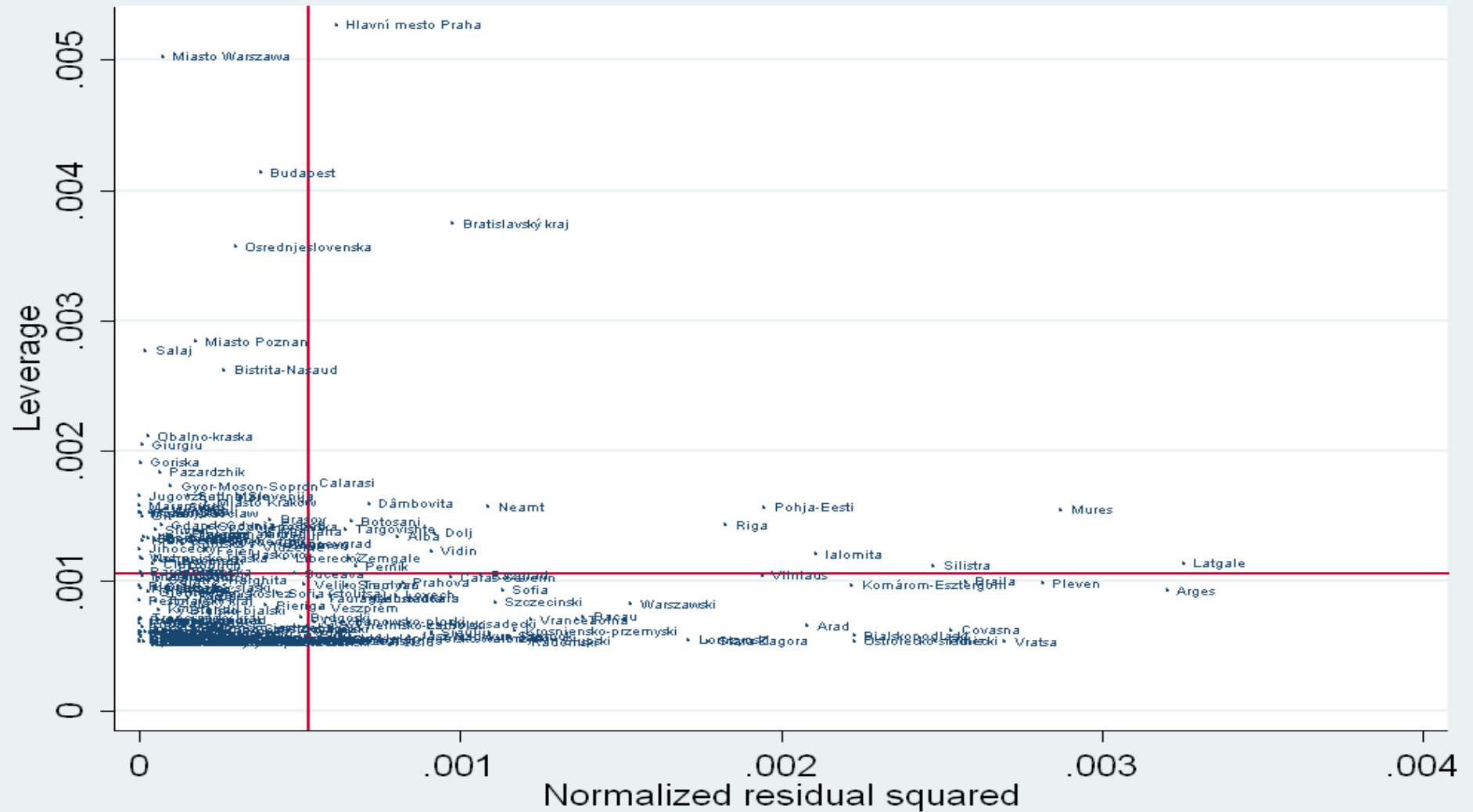
In the case of the model covering the period 1995-2004, shown in table 38 and represented in figure 16, there are nine observations with high leverage, with the highest leverage point being observed in the case of Prague (the Czech Republic) with the value .07. This is followed by Bratislava (Slovakia), Ljubljana (Slovenia), Budapest (Hungary), Zamgale (Latvia), Obalno-kraska (Slovenia), Smolyan (Bulgaria), Latgale and Vidzeme (both from Latvia). Figure 17 shows that Prague remains the observation with the highest leverage point, while Bratislava remains second, followed by Ljubljana and Budapest. In all these cases, although the ranking remains unchanged, the leverage is generally somewhat smaller. The same is true for the period 2001-2004. These indicate that capital cities, independently of the period covered by the model, are generally high leverage observations.

After identifying the presence of both outliers and observations with large leverage in each sample, now I turn to Cook's D, which provides an overall measure of influence, using information on the residual and the leverage simultaneously. It takes values from zero to the highest influential point in the given sample. The influential cases identified for the NUTS-3 level regression models are presented in table 39. According to the Cook's D influence measures, for the period 1995-2004 there are observations with high levels of influence. Based on the annualized growth rate we observe that Vilnius (Latvia) registered an annualized growth rate of 16.62%, followed by Riga (Latvia) with 16.26%, Pohja-Eesti (Estonia), which includes the capital city Tallinn, with nearly 16%, Budapest (Hungary) with 10.93%, and Vidzeme (Latvia) with 9.86%. There are also three influential cases with low growth performance, Karlovarský with an annual growth rate of 2.91%, Ústecký with 3.30% (both in the Czech Republic) and Sliven (Bulgaria) with a growth rate of 1.54%.

In the case of the period 1998-2004, when Romanian NUTS-3 level regions are also included in the sample, it is notable that despite the change in the data structure three capital cities, namely Pohja-Eesti (Estonia), Riga (Latvia) and Budapest (Hungary), remain among the observations with high influence. But they are joined by two other capital cities, namely Prague (the Czech Republic) with an annualized growth rate of 7.27%, and Bratislava (Slovakia) with 7.59%. There are also four Romanian regions among the high influence observations, all with high annual growth rates. When considering the model covering the period 2001-2004 at NUTS-3 level, one could note that the same capital cities, with the exception of Budapest (Hungary), are present among the eleven high influence observations.

All these indicate that by changing the sample (by including Romania) and varying the period under analysis there are notable changes in the data structure. It is also worth noting that in the case of Bulgaria and Romania NUTS-3 level regions with high influence vary by the period under analysis. However, when it comes to capital cities, many of the high influence cases remain the same irrespective of the period under consideration, which can be interpreted as an indication of possible structural differences in their growth performance compared to the other observations in the sample.

The regression diagnostics indicate that despite acceptable goodness-of-fit statistical results, the pooled OLS remains a basic model with several important possible drawbacks. An important assumption of the pooled OLS regression model is that residuals are normally distributed. To verify whether in our case the residuals that were saved after running each regression are normally distributed, the Smirnov-Kolmogorov normality test (also known as the skewness and kurtosis test for normality) is applied. The test uses chi-square to verify whether a statistically

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significant difference can be found between the cumulative distribution of the residuals and a theoretical normal distribution. The assumption or null hypothesis is that no difference exists. The test reveals that the null hypothesis cannot be rejected as the probability is .09%, which is more than the .05% threshold.

An alternative way to verify the normality assumption of the OLS regression approach is to use kernel density functions, which have the advantage of allowing a representation in graph format (see figure 19).

Perhaps the most important limitation is the omitted variable bias, which stems from the unit homogeneity assumption. To be able to capture possible local factors that produce regional differences, robustness tests need to be carried out to evaluate the extent of the omitted variable bias.

A fundamental assumption of OLS regressions is that error term variance in the cross-section is constant (homoscedasticity). In the case of regional per capita income heteroscedasticity could have its source in the different initial per capita income levels. The test for heteroscedasticity could be useful to visualize any patterns that indicate possible estimation errors (see figure 20).

Figure 19. Kernel densities

NUTS-2

NUTS-3

1995-2004

1995-2004

1998-2004

1998-2004

2001-2004

2001-2004
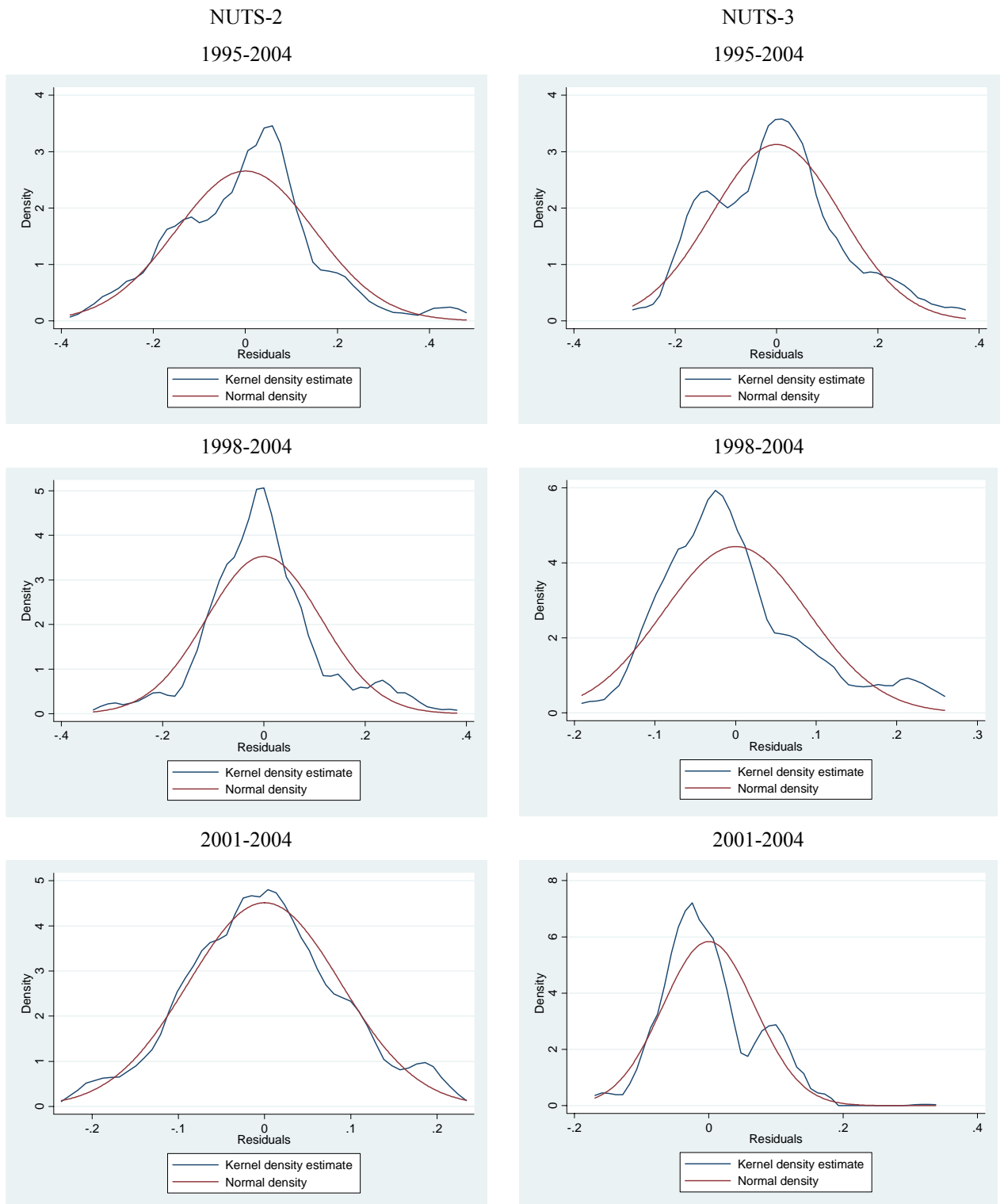
Figure 20. Pooled OLS residuals structures
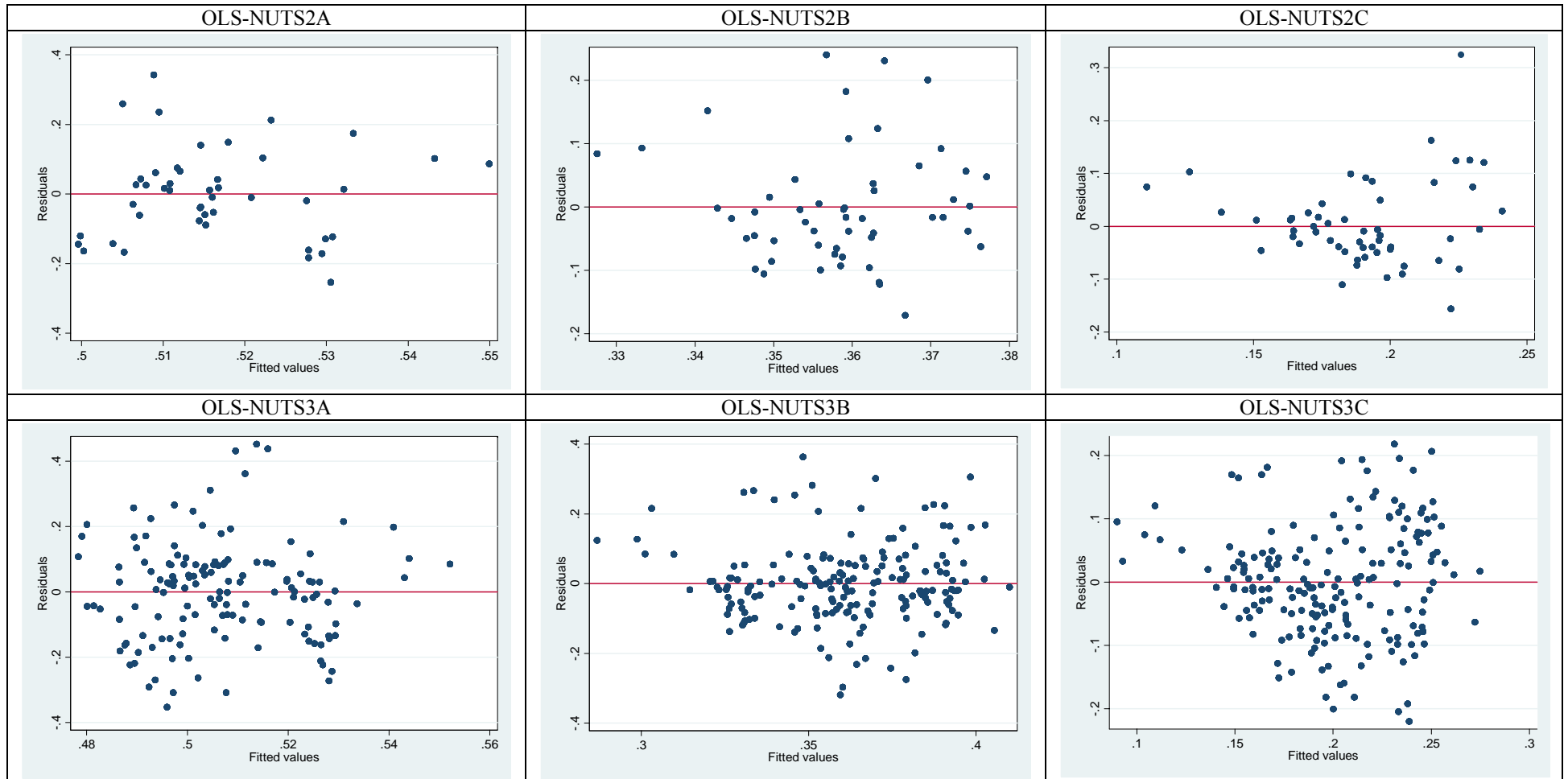
To verify the homoscedasticity of the pooled OLS regression residuals I use the Cameron & Trivedi's decomposition of IM-test and the Breusch-Pagan test, which both assume homogeneous variance of the residuals. The results are presented in table 18 for NUTS-2 and NUTS-3 levels. Considering the p-values for all four models, I conclude that the variance is not homogeneous. Therefore, to improve the predictive power of the regression models, in the following I need to deal with panel heterogeneity by introducing further explanatory variables.

Table 18. Cameron & Trivedi's decomposition of IM-test, NUTS-2 level regions									
	OLS-NUTS2A			OLS-NUTS2B			OLS-NUTS2C		
	chi2	df	p	chi2	df	P	chi2	df	P
Heteroscedasticity	2.40	2	0.3019	3.90	2	0.1413	88.11	2	0.0000
Skewness	52.29	1	0.0000	65.75	1	0.0000	14.19	1	0.0002
Kurtosis	0.00	1	0.9908	10.52	1	0.0012	0.47	1	0.4922
Total	54.68	4	**0.0000**	80.17	4	**0.0000**	102.77	4	**0.0000**
	OLS-NUTS3A			OLS-NUTS3B			OLS-NUTS3C		
	chi2	df	p	chi2	df	p	chi2	df	p
Heteroscedasticity	5.72	2	0.0572	1.91	2	0.03849	75.22	2	0.0000
Skewness	28.64	1	0.0000	38.99	1	0.0000	5.35	1	0.0207
Kurtosis	17.79	1	0.0000	80.93	1	0.0000	4.89	1	0.0270
Total	52.15	4	**0.0000**	121.82	4	**0.0000**	85.46	4	**0.0000**

The second test performed, the Breusch-Pagan test for heteroscedasticity, with results reported in table 19, serves the purpose of verifying the extent to which the output obtained in the pooled OLS regression complies with the assumption of the linear regression model.

Table 19. Breusch-Pagan test for heteroscedasticity

	NUTS-2			NUTS-3		
	OLS-NUTS2A	OLS-NUTS2B	OLS-NUTS2C	OLS-NUTS3A	OLS-NUTS3B	OLS-NUTS3C
chi2(1)	0.06	1.07	68.56	1.29	1.15	69.52
Prob > chi2	0.7989	0.3009	0.0000	0.2563	0.2827	0.0000

Once the homogeneity of the residuals assumption of the Cameron & Trivedi's decomposition of IM-test and the Breusch-Pagan test have been rejected for the OLSNUTS2C and the OLSNUTS3C models (period 2001-2004) and heteroscedasticity has been identified, we can draw the conclusion that by limiting the model to the initial per capita income (x_{it}), the pooled OLS regression could entail − besides stochastic disturbance − some regression unobserved time-invariant and/or individual-invariant systematic disturbance effects.

This representation does not indicate severe outliers among regions. Verifying whether there are outliers among the regions observed is crucial for the accuracy of estimation results, as a small number of large outliers could have an important impact on the overall results. Therefore, I formally evaluate the presence of outliers, for which I generate the standardized residuals and then tabulate them. The results indicate that the values of the standardized residuals range between [-2.49 and 2.47], which is evidence that the sample regions do not include any severe outliers. This is an important finding considering the nature of the dataset, especially for the robustness of the data.

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7.3 Testing conditional β-convergence

Although I have found some extent of unconditional β-convergence, heteroscedasticity has also been identified, which is likely to bias the results of the pooled OLS regression models. This provides the ground for testing conditional β-convergence. The fixed effect strategies address the possible different individual-invariant characteristics of regions by introducing proxies or dummy variables to capture the systematic disturbance of the basic pooled OLS model. First, I expand the basic model to include region specific dummy variables by country. By this, I seek to capture national effects. In this formulation, the intercept is suppressed and the unobserved country specific effects become the coefficient of the region-specific dummy variable. Second, to avoid perfect multicolinearity I identify the model by imposing the restriction of the sum of all dummy parameters to be equal to zero, where the coefficient captures the distance from the average country group effect. The two approaches to identify the least square dummy variable models can be expressed as follows:

$$y_{it} = \alpha_1 x_{it} + \sum_{i}^{n} \delta_i Country_i + \varepsilon_{it} \qquad (2)$$

and

$$y_{it} = \alpha + \alpha_1 x_{it} + \sum_{i}^{n} \delta_i Country_i + \varepsilon_{it} \qquad (3)$$

$$\text{where: } \sum_{i}^{n} \delta_i = 0$$

In contrast to the pooled OLS regression model, the least square dummy variable assumes that the intercepts of regions vary across countries, but are constant within countries. By including all country dummy variables, the model suppresses the intercept and the dummy coefficients become the actual parameters estimates. In equation three I also impose a restriction according to which the sum of dummy

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variable parameters reduces to zero. In this case, the model includes an intercept, but this is the true average parameter estimate.

The results of the regression analysis for the NUTS-2 level are presented in table 20, column OLS2. For reasons of comparability, I have included in the table the estimation results of the pooled OLS regression and the LSDV with restriction model specifications as well. To eliminate the transition shocks of late reformers (i.e. Bulgaria and Romania) only the two models starting with 1998 and 2001, respectively, are discussed.

The results indicate that all three OLS modeling strategies predict highly statistically significant convergence processes at the NUTS-2 level (cohesion regions) in the CEE-10 countries. In terms of the length of the period considered, different results are predicted by the pooled OLS regression strategy. Thus, while in the case of the regression covering the period 1998-2004 the conditional β-convergence is estimated to be of 2.08% per year, in the case of the period 2001-2004 a divergence of 0.39% can be observed.

Furthermore, while in the pooled OLS regression *t statistics* the intercept parameter estimate is not statistically significant, in the case of the LSDV regression the reported intercept coefficient becomes significant for both the NUTS-2 and NUTS-3 level data.

It is also worth noting that there are important differences in the statistical significance of the estimated slopes of the pooled OLS and the LSDV models. Thus, the slope for the NUTS-2 level data reported by the pooled OLS model is .918, while the LSDV model reports a slope of 1.404. There is an even larger difference in slope between the two models when using NUTS-3 level data, .918 and .025, respectively.

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There are also important differences in the intercepts for the NUTS-2 level model, but not in the case of the NUTS-3 level data. Yet, with the inclusion of country dummy variables in the model, the estimation of the intercept is significantly improved. The true intercept for the NUTS-2 model is -4.335, and the one for the NUTS-3 level data with country dummy variables is -.127.

In the LSVD model we find highly significant country dummy effects, which confirms the results of the Cameron & Trivedi's decomposition of IM-test and the Breusch-Pagan homogeneity tests on the pooled OLS regression. The country dummy coefficients indicate important and statistically significant country group deviations from the average group effect.

The intercept or country dummies are obtained by adding the individual dummy coefficient to the average group effect captured by the model intercept. Thus, for the NUTS-3 level analysis we find that Bulgaria (-4.218), Estonia (-3.911), Latvia (-3.987), Lithuania (-4.093) and Romania (-4.022) have intercepts below the average group mean, while the Czech Republic (-4.845), Hungary (-4.396), Poland (-4.667), Slovenia (-4.726), and Slovakia (-4.485) are all above the average group mean.

According to regression results reported in table 20, after controlling for country fixed effects at the NUTS-2 level for the period 1998-2004, the slight annual divergence predicted by the pooled OLS regression is reversed by LSDV regression to an annual 2% convergence rate. Although for the period 2001-2004 the divergence prediction is not reversed, it is considerably lower in the case of LSDV regression (slightly less than .4% compared to an almost 1.6% yearly divergence). These findings seem to suggest that despite considerable macro-economic policy and institutional reforms, the CEE-10 countries converge to different steady-states.

	Period 1998-2004			Period 2001-2004		
	OLS	OLS1	OLS2	OLS	OLS1	OLS2
Constant	.599 (6.70)***		-4.335 (-13.74)***	.783 (11.91)***		.355 (5.54)***
AG1998-2004NUTS2	-.027 (-2.69)***	.136 (12.63)***	.136 (12.63)***			
AG2001-2004NUTS2				-.066 (-9.04)***	-.016 (-2.22)**	-.016 (-2.22)**
Bulgaria		-0.758 (-8.38)***	.048 (5.07)***		.312 (5.13)***	-.043 (-6.33)***
Czech Rep.		-.968 (-9.62)***	-.162 (-19.29)***		.323 (4.83)***	-.032 (-5.40)***
Estonia		-.659 (-6.81)***	.147 (8.91)***		.427 (6.51)***	.072 (5.70)***
Latvia		-.731 (-7.57)***	.113 (6.78)***		.385 (5.98)***	.030 (2.40)**
Lithuania		-.731 (-7.57)***	.075 (4.52)***		.424 (6.52)***	.069 (5.45)***
Hungary		-.833 (-8.60)***	-.027 (-3.70)***		.296 (4.54)***	-.059 (-10.59)***
Poland		-.909 (-9.51)***	-.104 (-18.48)***		.285 (4.64)***	-.071 (-16.44)***
Romania		-.702 (7.71)***	.104 (12.26)***		.447 (7.37)***	.092 (14.42)***
Slovenia		-.941 (-9.13)***	-.136 (-7.75)***		.313 (4.52)***	-.042 (-3.20)***
Slovakia		-.863 (-8.79)***	-.057 (-6.24)***		.339 (5.16)***	-.016 (-2.34)**
Adjusted R^2	0.00			0.13		
β	**-.38***	**2.08***	**2.08***	**-1.59***	**-.39***	**-.39***
Half-time	-181	33		-44	-179	
F-statistics	7.26***	2015.64***	83.94***	81.64***	1022.74***	101.39***
Root MSE	.09	.06	.06	.07	.04	.4
N	53	53	53	53	53	53

Notes: OLS – pooled ordinary least square, OLS1 – Least Square without Intercept, OLS2 – Least Square with Restriction, Absolute value of t statistics in parentheses
Significant at *p<10, ** p<.05, *** p<.01

In the case of NUTS-3 level the LSDV regression indicates (see table 21) that there are important country effects as divergence rates are reduced for the period 1998-2004 and reversed for the period 2001-2004. Similarly to the results at NUTS-2 level, we observe that country dummies control for much of per capita GDP income variance, and therefore support the presence of country fixed effects.

Table 21. NUTS-3 level regression estimates of national per capita income

	Period 1998-2004			Period 2001-2004		
	OLS	OLS1	OLS2	OLS	OLS1	OLS2
Constant	.856 (15.91)***		-.762 (4.61)	-.081 (-18.01)***		-.028 (-.57)
AG1998-2004NUTS3	-.057 (-9.21)***	-.011 (-10.07)***	-.011 (-10.07)***			
AG2001-2004NUTS3				.918 (22.98)***	.025 (4.61)***	.025 (4.61)***
Bulgaria		.714 (20.47)***	-.047 (-6.45)***		-.029 (-0.63)	-.002 (-.32)
Czech Rep.		.734 (16.27)***	-.028 (-2.90)***		-.071 (-1.38)	-.043 (-7.47)***
Estonia		.844 (21.69)***	.083 (6.49)***		.019 (0.39)	.047 (5.61)***
Latvia		.763 (20.34)***	.001 (0.11)		-.028 (-0.58)	.000 (.01)
Lithuania		.788 (20.27)***	.026 (2.88)***		.031 (0.63)	.059 (9.66)***
Hungary		.789 (19.53)***	.027 (4.00)***		-.081 (-1.62)	-.053 (-11.49)***
Poland		.685 (16.93)***	-.076 (-14.10)***		-.094 (-1.90)*	-.066 (19.66)***
Romania		.772 (22.35)***	.010 (1.51)		.108 (2.34)**	.136 (30.80)***
Slovenia		.753 (16.54)***	-.009 (-0.83)		-.094 (-1.82)*	-.067 (-10.59)***
Slovakia		.773 (18.37)***	-.012 (1.16)		-.039 (-0.78)	.011 (-1.66)*
Adjusted R^2	0.04			0.15		
β	-.18***	-.16***	-.16***	-1.94***	.63***	0.63***
Half-time	-381	-404	-404	-36	109	109
F-statistics	84.88	2421.81	82.44	324.44	1883.93	233.61
Root MSE	.11	.10	.10		.06	.06
N	190	190	190	190	190	190

Note: OLS – pooled ordinary least square, OLS1 – Least Square without Intercept, OLS2 – Least
Square with Restriction, Absolute value of t statistics in parentheses
Significant at *p<10, ** p<.05, *** p<.01

Figure 21 presents country plots to visualize the specific distances from the average country group effect for the NUTS-3 least square dummy variable model. This visualization clearly shows the country specific variation of the intercept in a statistically significant way. Furthermore, these figures indicate two possible problems with the regression results. First, there are the outliers whose presence is likely to strongly bias the estimation results in the case of the ten country regression lines. For instance, in the case of Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, and Slovenia the capital cities are outliers.

Figure 21. Country for NUTS3 level, period 2001-2004

Bulgaria
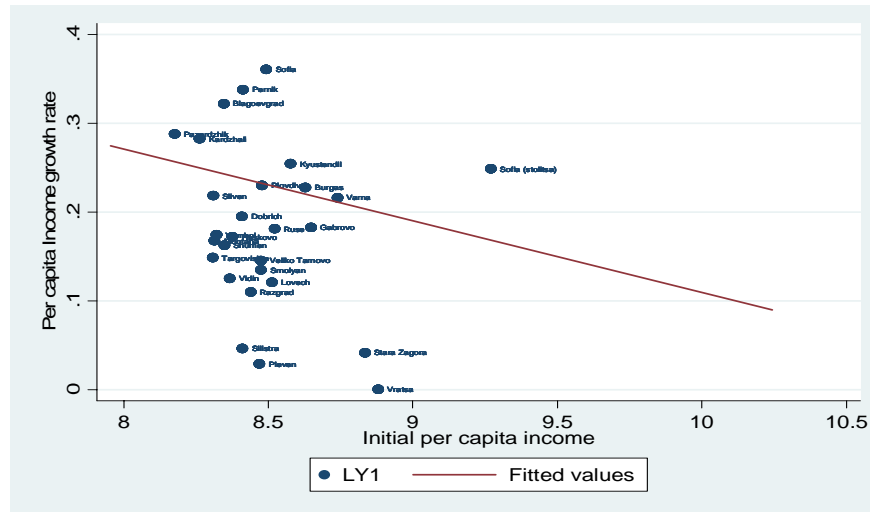
Czech Republic
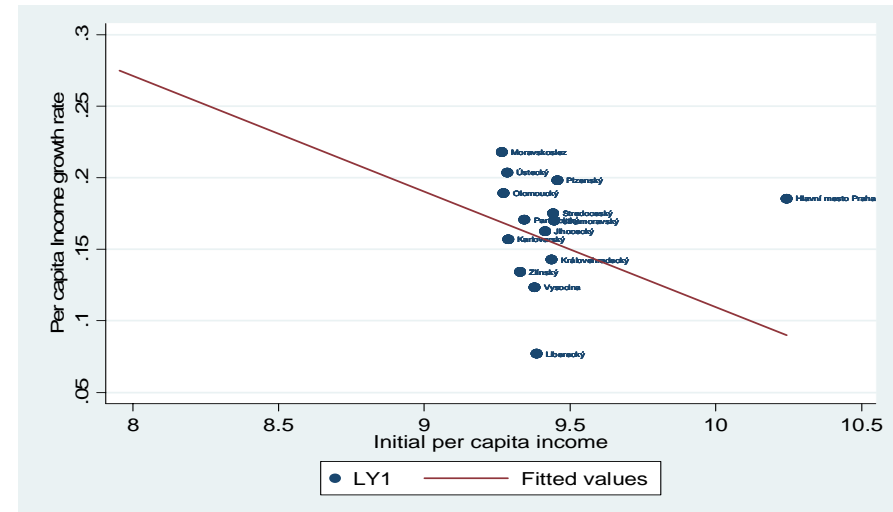
Estonia
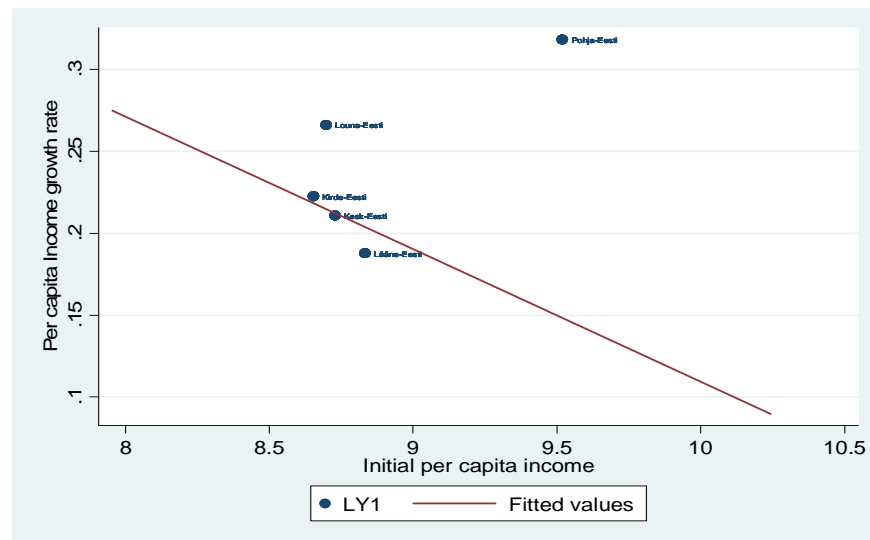
Hungary
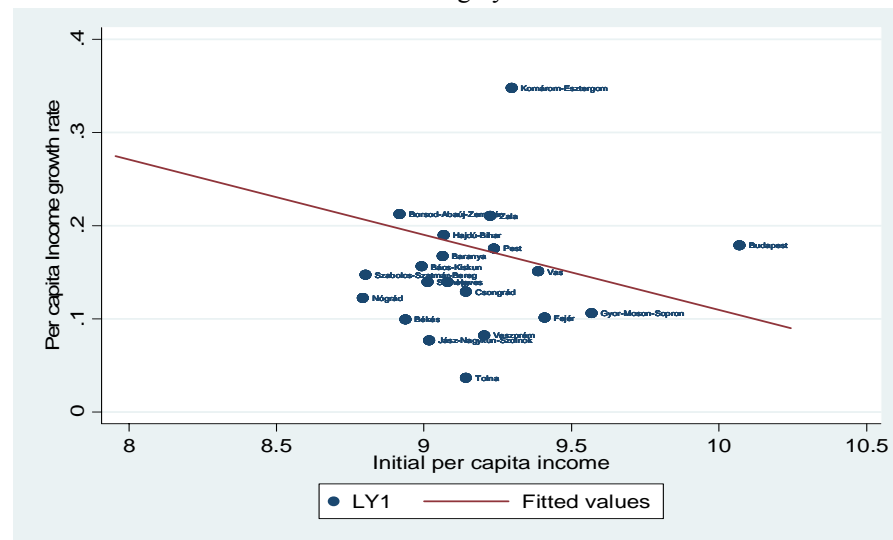
Latvia
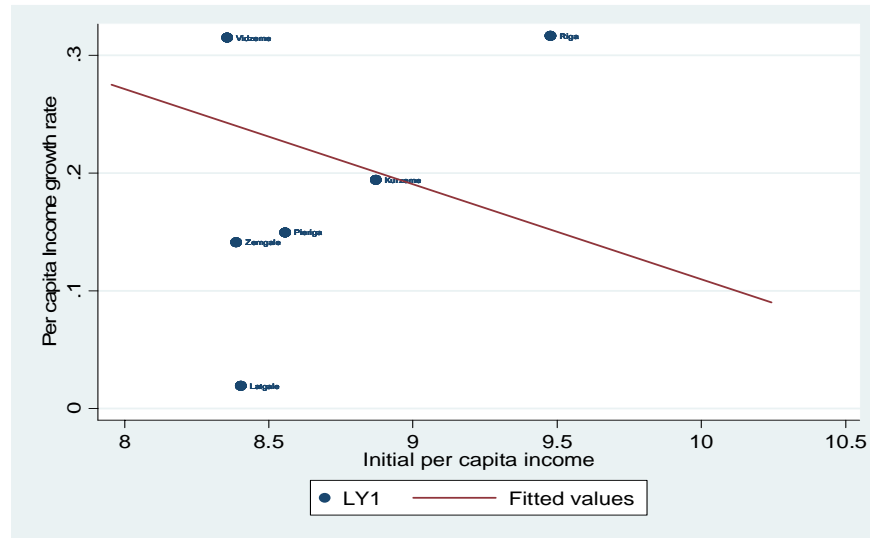
Lithuania
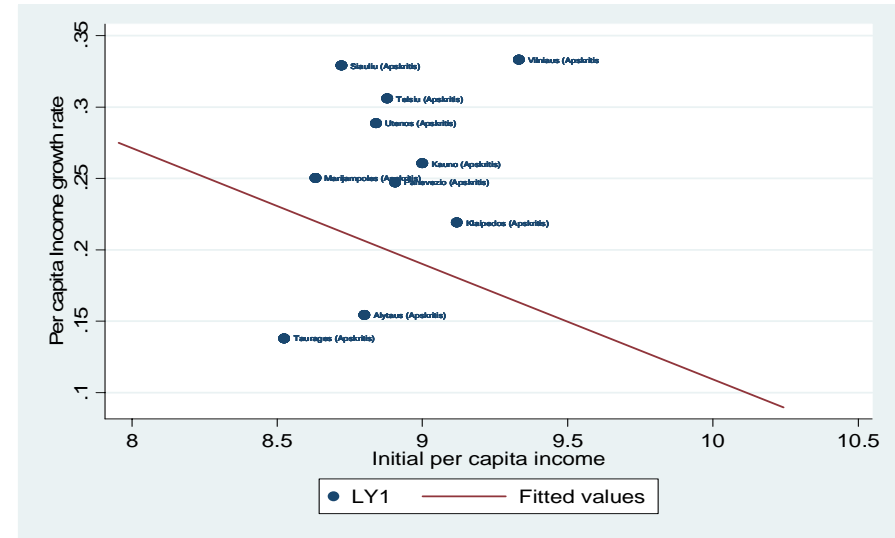
Poland
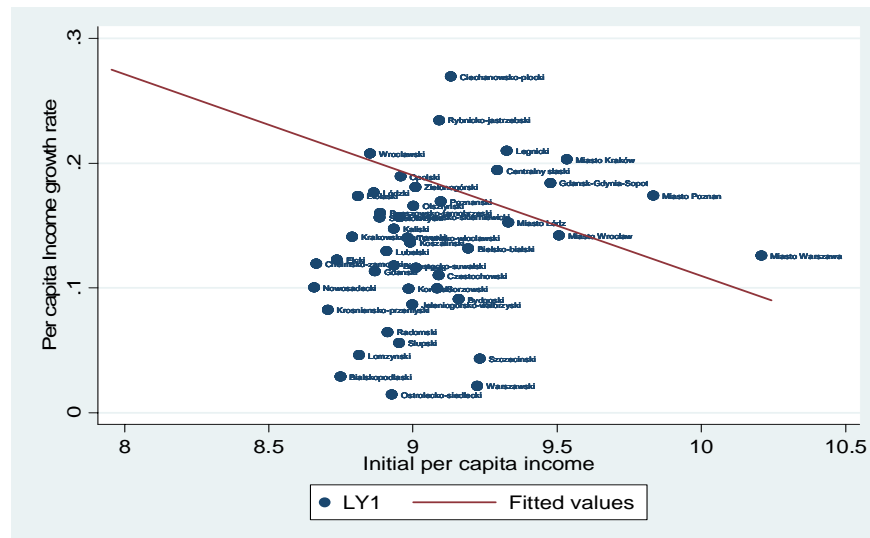
Romania

Slovenia

Slovakia

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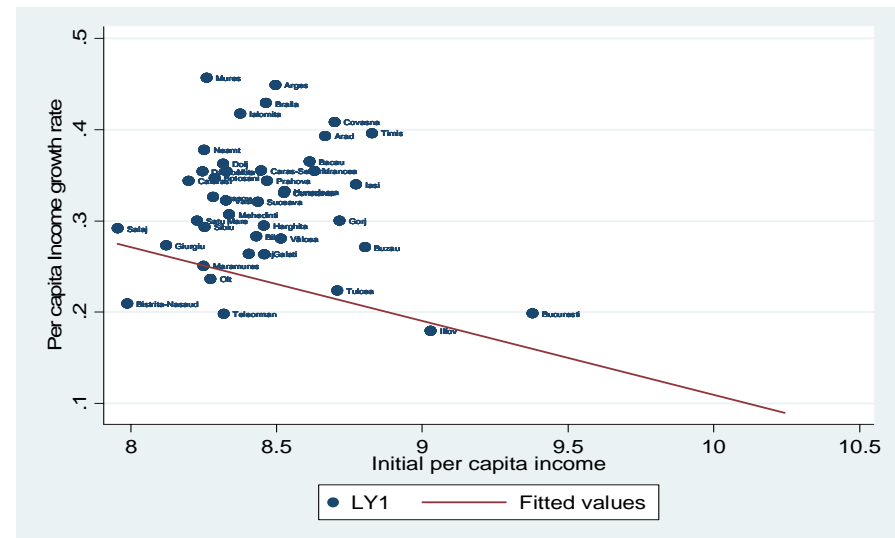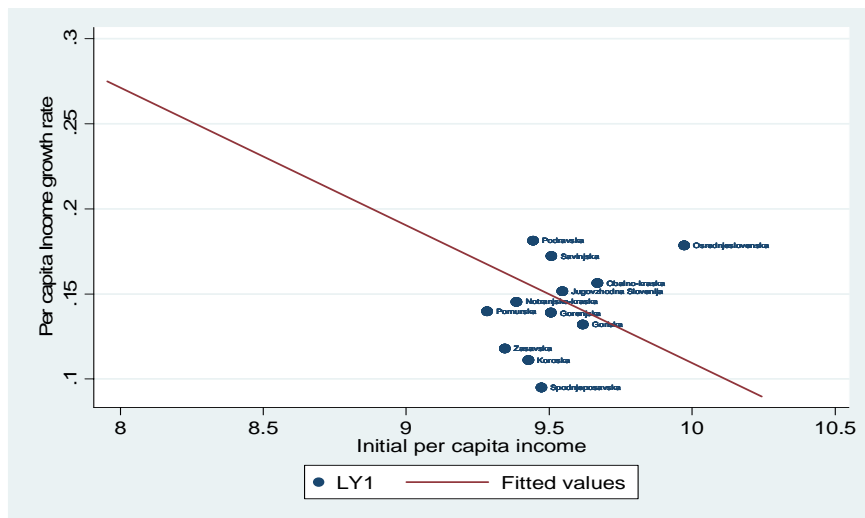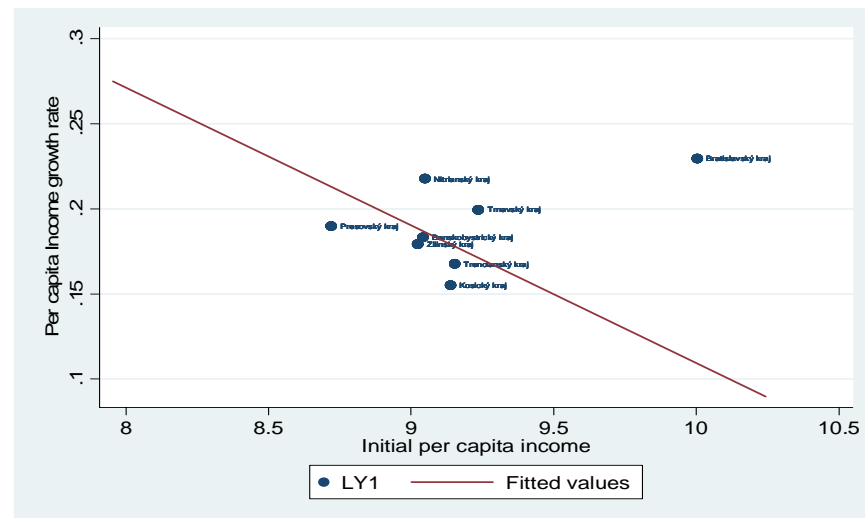
Second, one could observe that country regressions most likely suffer from the omitted variable bias. For instance, regions with a high degree of homogeneity in terms of the initial level of per capita income have very different annualized growth performances. This is the case in all countries.

7.4 Testing σ-convergence

In the literature there are several methods to verify σ-convergence. For instance, Dalgaard and Vastrup (2001) discuss standard deviation of log income per worker in contrast to the coefficient of variation and find that although these two dispersion measures are often used interchangeably, they produce different results depending on the structure of the observations over time. This draws attention to the possible impact of data heterogeneity in the panel on the robustness of statistical results. In this sense, Im et al. (2003) propose the adoption of test unit root procedure to hypothesis testing in the case of heterogeneous panels. Considering that we have only limited degrees of freedom in terms of time-series observations, under conditions of structural reforms, the possible lags are both too few and arbitrary to build robust unit root tests.

Instead, I propose to proceed by using the coefficient of variation to verify whether per capita income among our units of observation is decreasing over time in absolute terms. Here a mostly neglected methodological challenge emerges, namely that a decrease of variation between observations could, under conditions of structural reforms, at least theoretically, be attributed to group heterogeneity in approaching the steady state.

σ-convergence is tested through an analysis of the coefficient of variation, calculated by dividing the time-series standard deviation by the sample mean of the cross-section and multiplying it with one hundred. First, we observe important country

variations in annual average per capita GDP levels for the period 1991-2005. Table 22 indicates that the smallest per capita income GDP was registered in Romania in the year 1992, when per capita GDP in PPS took the value of EUR 3,920 as opposed to the highest value of EUR 18,900 in the case of Slovenia in the year 2005.

It is important to note that there is no clear relationship between the temporal coefficient of variation and the rank of a country in terms of per capita GDP. Thus, not all countries with lower per capita income registered higher income growth rates than countries with higher initial per capita GDP levels. Yet, the common feature of the country sample is that in all countries per capita GDP was significantly higher at the end of the period than at the beginning. For instance, the Czech Republic, Hungary, Romania, and Slovenia doubled their per capita GDP over the period, while Latvia, Lithuania, and Poland registered a two and a half fold increase. The worst performing country was Bulgaria with a less than twofold increase, while the best performing country was Estonia, which registered a threefold increase of per capita GDP.

Table 22. Within country variation of per capita GDP, period 1991-2005

	Mean	Standard deviation	Coef. variation	Min	Max
					t=15
Bulgaria	5,335.33	996.34	18.67	4,360	7,530
Czech Republic	12,333.33	2,576.81	20.89	9,150	17,360
Estonia	7,814.67	2,888.92	36.97	4,810	14,120
Hungary	9,926.00	2,605.55	26.25	7,290	14,410
Latvia	6,733.33	2,050.07	30.45	4,450	11,060
Lithuania	7,619.33	2,126.26	27.91	5,030	12,190
Poland	7,907.33	2,411.21	30.49	4,500	11,690
Romania	5,238.00	1,247.64	23.82	3,920	8,140
Slovakia	8,678.00	2,371.59	27.33	5,570	12,900
Slovenia	13,204.67	3,255.94	24.66	9,300	18,900

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The different income growth levels in the case of national level per capita GDP for the ten countries under study indicate alternative convergence and divergence processes in the series for the period 1991-2005. Thus, figure 22 shows that in the period 1991-1994 the coefficient of variation registered a steady increase from 29.70 in 1990 to 34.52 in 1994, which indicates a process of income divergence among the countries. In the period 1995-1998 there was a mixed picture with both increase and decrease of per capita income. Starting with 1999 we can observe a steady process of decrease of per capita GDP dispersion among countries, which can be interpreted as convergence.

According to the findings presented in figure 22, country per capita GDP income differences at the end of the period were smaller compared to the differentials observed at the beginning of the period. This suggests that despite the different convergence/ divergence processes during the transition period, the distribution of income in PPS became more equitable among the ten countries by the year 2005.

Figure 22. Regional between country coefficients of variation
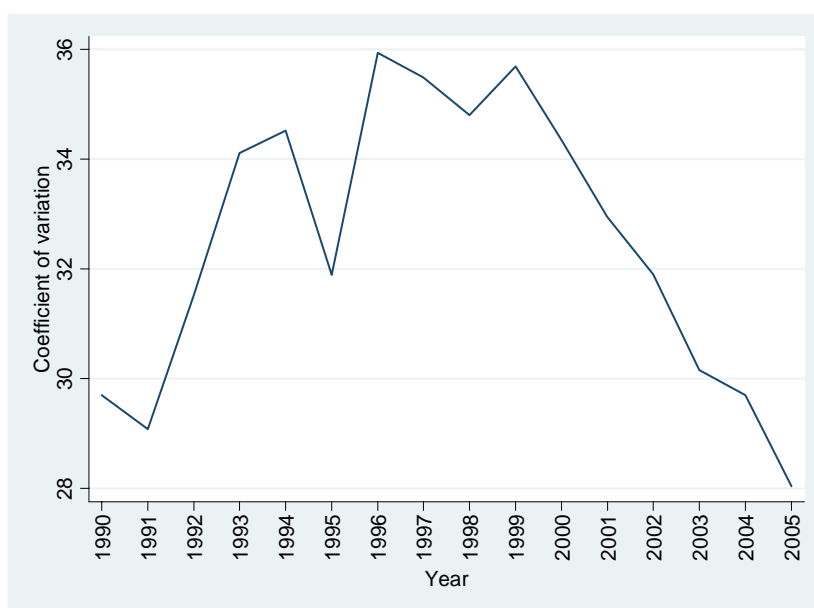
Note: Own calculations based on WIIW Transition Report data

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Besides the decreasing trend of country level per capita income differences, the figure above also indicates that disparity remains relatively high (28.04). This suggests that – besides important between country income variations during the reform period – there are also significant within country variations in the case of the ten countries.

In the next step, I propose to evaluate, in a comparative framework, the within country variation by focusing on the country specific spatial or county level (NUTS-3) income differentials. Due to gaps in data, the period 1995-2004 can only be studied using an unbalanced panel set.

At the level of the ten countries, the overall mean per capita income expressed in GDP at NUTS-3 level for the period 1995-2004 was 7,694.81. Table 23 presents the mean variation for regions grouped by country. We can observe important country specific variations. The countries below the regional mean are Bulgaria (4,693.41), Romania (5,142.19), Latvia (5,802.91), Lithuania (6,861.27), and Estonia (6,975.58), while those above the overall regional average are Slovenia (12,672.55), the Czech Republic (12,350.65), Slovakia (9573.14), Hungary (8,925.18), and Poland (8,177.696). Mean per capita GDP of NUTS-3 regions at country level indicate rather high gaps between the worst and best performing countries.

In terms of country level income disparity, Slovenia, with the largest mean per capita GDP of 12,672.55, registered the lowest coefficient of variation (25.28), the minimum per capita income being 7,932.9 in the year 1995 in Notranjsko-Kraska and the maximum being 25,595.8 in Osrednjeslovenska (Ljubljana) in the year 2004. The two largest overall income variations were registered in Latvia (56.37) and Slovakia (49.29). In contrast, Bulgaria, with the lowest mean per capita GDP of 4,693.42, has a coefficient of variation of 30.67, the minimum value of 2,698.7 being registered in the

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Smolyan district in 1995 and the maximum of 13,598.8 in Sofia (Stolitsa) in 2004. The

coefficient of income variation in the most heterogeneous country (Latvia) was almost

twice as high as in the case of the most homogeneous country (Slovenia).

Table 23. Variation of per capita GDP income

Period 1995-2004

	Mean	St. dev.	Co. var.	Min	Max	N
Bulgaria	4,693.418	1,439.536	30.67	2,698.7	13,598.8	280
Czech Rep.	12,350.650	4,135.935	33.49	8,830.5	33,783.9	140
Estonia	6,975.586	3,341.860	47.91	3,702.9	18,727.3	50
Hungary	8,925.179	3,784.559	42.40	4,425.3	28,231.6	180
Latvia	5,802.918	3,270.995	56.37	2,813.9	17,921.0	60
Lithuania	6,861.276	2,188.595	31.90	3,450.7	15,754.2	100
Poland	8,177.696	3,504.713	42.86	4,037.6	30,733.3	420
Romania	5,142.191	1,775.468	34.53	2,367.9	14,424.6	294
Slovakia	9,573.139	4,718.625	49.29	4,383.5	27,801.6	80
Slovenia	12,672.550	3,203.863	25.28	7,932.9	25,595.8	120

Table 24 presents the NUTS-3 regions with the largest and those with the lowest

per capita GDP in each country under study. We can observe that the highest ranking

regions are the capital cities and that the relative country position to the regional mean

remains unchanged in the case of both the lowest and the highest ranking regions. The

highest ranking regions are all capital city regions, which indicates that – regardless of

the national context – capital city regions surpass all other regions.

Overall country variation provides only limited information on the variance of

NUTS-3 groups. A key advantage of using panel data is that it provides information

not only on the cross-section (between subjects variance) or the time-series trend

(within subject variance), but on both. Thus, besides information on the overall

variation of income per capita, we also have information on the variance components

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(variation within each group (region) and variation between group means) in terms of income per capita.

Table 24. NUTS-3 level regions with lowest and highest per capita GDP income

in decreasing order

	Lowest	Highest
1	Vysocina (1995), The Czech Republic	Hlavní mesto Praha (2004), The Czech Republic
2	Notranjsko-kraska (1995), Slovenia	Miasto Warszawa (2004), Poland
3	Nógrád county (1995), Hungary	Budapest (2004), Hungary
4	Presovský kraj (1995), Slovakia	Bratislavský kraj (2004), Slovakia
5	Lomzynski (1995), Poland	Osrednjeslovenska, Slovenia (2004)
6	Louna-Eesti (1995), Estonia	Pohja-Eesti (2004), Estonia
7	Taurages (Apskritis) (1995), Lithuania	Riga (2004), Latvia
8	Zemgale (1995), Latvia	Vilniaus (Apskritis) (2004), Lithuania
9	Smolyan district (1995), Bulgaria	Bucharest (2004), Romania
10	Salaj county (2000), Romania*	Sofia (Stolitsa) (2004), Bulgaria

Note: *only period 1998-2004

The regional coefficient of variation between the 190 NUTS-3 level regions is 49.35, which captures the deviation of the regions from the regional mean without considering their country grouping. To assess the extent of income variation between the means of the countries using NUTS-3 level data, regions are grouped by country. The resulting statistics reported in table 25 show per capita income dispersion in the CEE-10 countries.

The main finding is that the country with the highest overall per capita mean (Slovenia) and the one with the lowest overall per capita mean (Bulgaria) have similarly low levels of deviation in the cross-sectional disparity structures if compared to the other countries in the sample. This suggests that in the case of these two countries, NUTS-3 level per capita income disparity is much larger between regions belonging to different countries than between regions belonging to the same country.

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In contrast, the country level variation from the national mean in the cross-sectional disparities in the cases of Latvia (52.96), Poland (46.99), and Estonia (42.53) seems to indicate that the heterogeneity of per capita income of the NUTS-3 regions is of similar magnitude as that at the level of the ten-country sample.

Table 25. Between NUTS-3 region variation of per capita GDP income by country

period 1995-2004

	St. dev.	Co. var.	Min	Max	N
Bulgaria	1,167.800	24.88	3,676.540	9,479.39	28
Czech Republic	3,808.621	30.84	10,457.570	25,409.87	14
Estonia	2,966.845	42.53	5,292.300	12,255.81	5
Hungary	3,190.992	35.75	5,743.989	20,449.21	20
Latvia	3,073.507	52.96	3,722.740	11,720.08	6
Lithuania	1,586.559	23.12	4,534.150	10,301.50	10
Poland	3,843.032	46.99	5,424.030	28,510.20	45
Romania	1,500.310	29.18	3,059.757	11,245.84	42
Slovakia	4,544.276	47.47	5,773.130	20,465.49	8
Slovenia	2,532.575	19.98	10,129.190	19,582.03	12

Having seen the high levels of variation between the means of the ten countries, now I turn to evaluate the variation of income disparity within each country. The within country variation captures the deviation of NUTS-3 regions from the mean national scores over the studied period. According to table 26, per capita GDP income differences at the NUTS-3 level indicate a more limited variability compared to the scores obtained for between country variation, e.g. Latvia (28.28), Lithuania (23.05), and Estonia (28.61). Nevertheless, the two countries with the lowest per capita income levels, Bulgaria (18.48) and Romania (18.93), have only moderate levels of coefficient of variation. The fact that per capita income disparity levels between countries is more heterogeneous than income disparity within each country shows how important the income gap between the countries is.

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Table 26. Within NUTS-3 region variation of per capita GDP income by country

<div align="right">Period 1995-2004</div>

	St. dev.	Co. var.	Min	Max	N
Bulgaria	867.467	18.48	1,409.028	8,812.828	10
The Czech Republic	1,881.377	15.23	4,807.180	20,724.680	10
Estonia	1,995.641	28.61	1,936.876	13,447.080	10
Hungary	2,143.720	24.02	1,966.668	16,707.570	9
Latvia	1,641.326	28.28	9,07.6381	12,003.840	10
Lithuania	1,581.648	23.05	2,708.676	12,313.980	10
Poland	1,357.674	16.60	2,136.336	13,802.240	9.33
Romania	973.370	18.93	1,814.049	8,320.948	7
Slovakia	1,991.873	20.81	3,683.849	16,909.250	10
Slovenia	2,082.280	16.43	7,327.322	18,686.320	10

The overall, between and within NUTS-3 regions coefficients of variation measured at country level indicate that in the case of the ten countries under analysis there are important differences in terms of income disparity, both between and within countries. Although between country variation of per capita income disparity is larger than within country per capita income disparity, we observe that in the period 1995-2004 within country income differences increased over time (see figure 23). Thus, the increase of the values of the coefficient of variation for the period 1995-2004 leads to the conclusion that, as expected, there is per capita regional income divergence for all ten countries.

Figure 23. Sigma convergence across NUTS-3 level regions

Graphs by Reg

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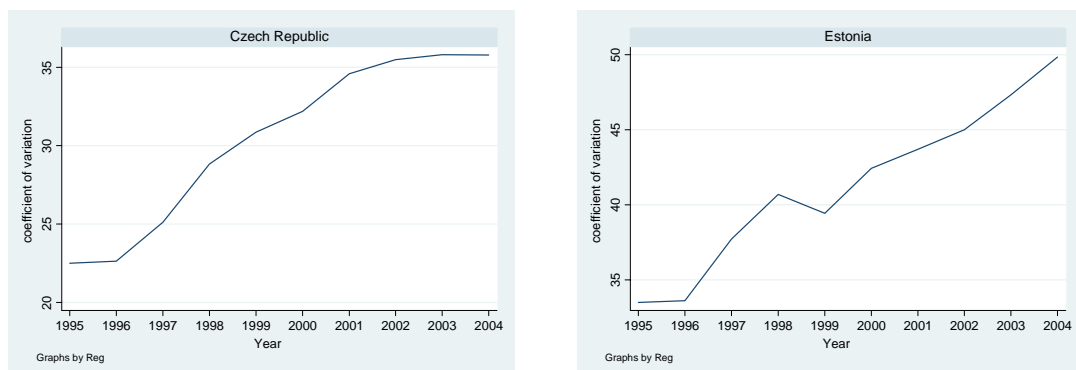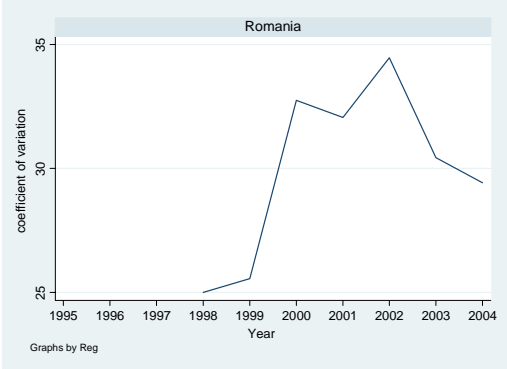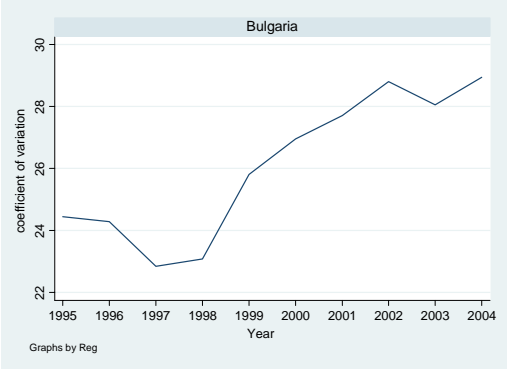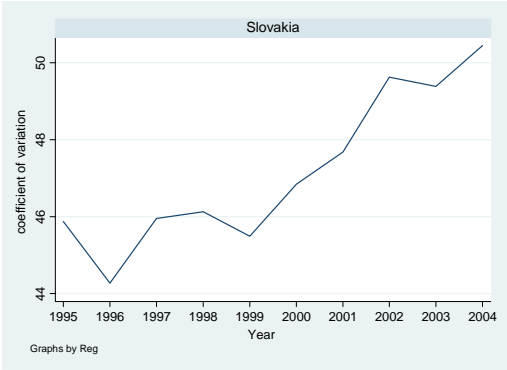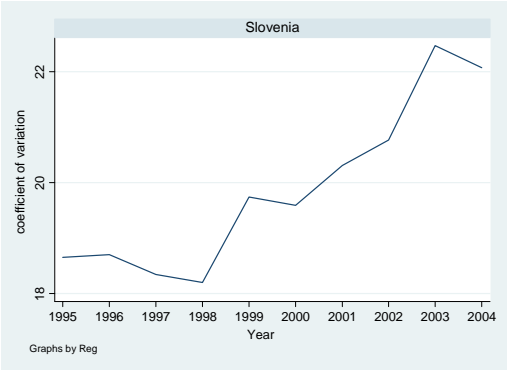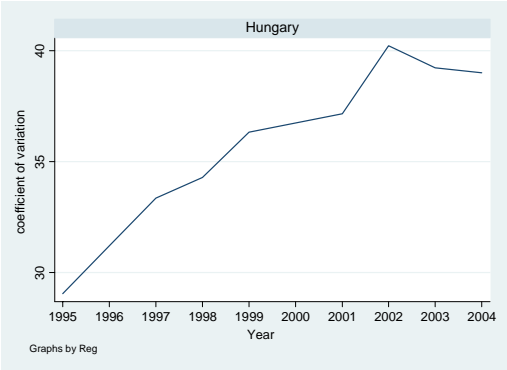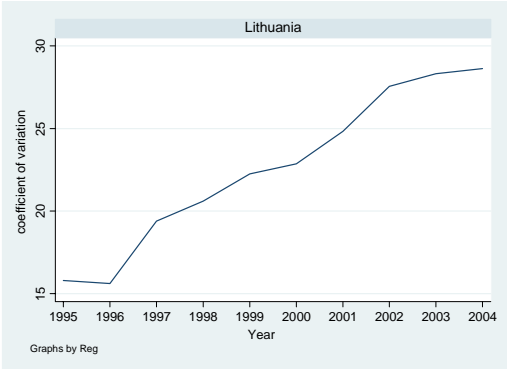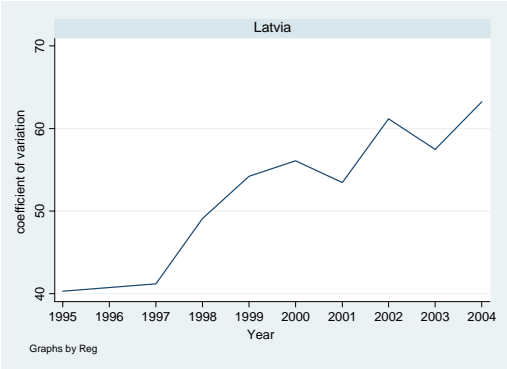
As a conclusion to the statistical analysis carried out so far, we can say that the general pooled OLS regression using NUTS-2 level planning regions data seems to confirm the annual rate of 2% convergence already accepted by the convergence literature. Surprisingly, if using NUTS-3 level data, the estimation results produce significantly different results, i.e. they indicate divergence instead of convergence. This finding draws attention to the importance of using NUTS-2 level data with much care, as these units are simply assigned statistical regions, and not regional economies. In contrast, NUTS-3 level data capture local economic processes much more accurately, as they represent the highest level of local government.

In the next step, to correct for the likely specification errors of the pooled OLS, I tested for the presence of country specific individual-invariant effects. The estimation results and their statistical robustness indicate that the hypothesis of country specific intercepts is verified and that belonging to a certain country systematically influences both the level of initial conditions and the per capita annual growth rates of NUTS-3 regions, which implies important panel heterogeneity at the level of the 190 NUTS-3 level regions.

An important finding is that – without exception – all 190 NUTS-3 level regions registered absolute growth in terms of per capita income levels for the period 1995-2004. Thus, some regions grow at a lower rate than predicted by the neo-classical growth theory, while agglomeration economies also fail to distance themselves from lagging regions.

As predicted by the theoretical framework, the coefficient of β-convergence is positive, with the exception of the pooled OLS model at NUTS-3 level, and it is also statistically significant from zero. Despite these improvements of the LSDV models in

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the goodness-of-fit statistics, it is clear that simple regressions still conceal important factors that explain the growth performances of individual regions.

It is important to reiterate that NUTS-2 level country dummy conditional convergence has been verified for all three regression models. Nevertheless, it can be observed that the LSDV models severely decrease the level of convergence predicted by the pooled OLS model. Thus, in the case of the NUTS-2 regions, while the unconditional pooled OLS regression model predicted a 2.5% annual convergence rate, this level dropped to 0.9% if country dummies were introduced.

An even more peculiar result was obtained when dealing with NUTS-3 level regions. The pooled OLS regression reported a divergence rate of 0.8%, which was reversed to a rate of 0.3% convergence when country dummies were introduced. However, this can hardly be interpreted as a real convergence process.

These findings are consistent with the expectation that national policies have important effects on the growth performance of regions. Despite the acceptable robustness of these findings, I have identified only a very slow speed of convergence, which by no means is an encouraging result if considering the efforts at both the national and the European regional policy levels to improve the homogeneity of regions within the European Union.

7.5 Testing convergence clubs

The estimations of the previous sections indicate that the growth performance of both NUTS-2 and NUTS-3 level regions is significantly influenced by their general national context. Nevertheless, the convergence tests based on growth performance provide evidence that while at NUTS-2 level convergence can be observed, in the case of

NUTS-3 level regions divergence can be observed. A possible explanation for these contradictory results could be that NUTS-2 level regions conceal important NUTS-3 level per capita income heterogeneity structures. An alternative interpretation of these opposing processes is that they are an indication of more complex convergence/ divergence processes among groups of regions that share specific time-invariant characteristics. The finding of opposing convergence/ divergence processes at the level of cohesion regions and at that of counties/districts is even more important as in most CEE-10 countries the actual local government tiers are NUTS-3 level regions, while NUTS-2 regions are restricted in purpose to be mere statistical planning units, with delegated responsibilities from the different government tiers (except in Poland).

My goal in this section is to verify whether a set of convergence clubs could be identified, the presence of which could shed further light on the heterogeneity structure in growth rates in the cross-section and better approximate its dynamics compared to the pooled OLS and least-square dummy variable regression models.

The theoretical expectation of convergence club models (Berthelemy and Varoudakis, 1996; Canova, 2004; Le Gallo and Dall'erba, 2006; Fischer and Stirbock, 2006) is that besides country specific macro socio-politic context effects, there are some peculiar NUTS-3 level individual-invariant characteristics that produce breaks in the convergence/divergence processes identified at the national level.

This expectation is also justified by the findings of the previous sections, according to which there are important NUTS-3 level per capita income variations both in the cross section and over the different time periods. An important finding was that despite observing per capita income growth in all the 190 NUTS-3 level regions in the ten countries under study, there is no strong enough evidence suggesting that the regions would tend to converge to the same steady state. This finding has two possible

explanations: either regional growth processes are complex and simple unconditional mean based OLS regressions cannot capture them accurately, or indeed regions do not converge to the same steady state.

In this section, I adopt the least-absolute value model approach to identify possible convergence groups that would capture per capita growth processes in the ten country cases more accurately. For this purpose, I decompose the panel by quintiles and include both the cross-sectional and time-series dimension. The results are reported in table 27. It must be noted that 1,514 represents all observations. Thus, each yearly observation is assumed to be independent of the one from the previous year. Naturally, the level of per capita income in each region is related to scores in subsequent years, but this formulation allows for capturing the possible movement of regions from one quintile to another. This form of representing results was chosen to include both panel data dimensions, the results being reported in the transition matrix below.

Table 27. Convergence club position and evolution of NUTS-3 regions

	2367.9-4558.9	4562.7-5924.6	5928.7-7609.4	7618.1-10304.4	10316.4-33783.9	Total
2367.9-4558.9	**259** **(75.95%)**	82 (24.05%)	0 (0%)	0 (0%)	0 (0%)	341
4562.7-5924.6	11 (3.57%)	**203** **(65.91%)**	93 (30.19%)	1 (0.32%)	0 (0%)	308
5928.7-7609.4	0 (0%)	9 (2.97%)	**225** **(74.26%)**	69 (22.77%)	0 (0%)	303
7618.1-10304.4	0 (0%)	0 (0%)	2 (0.7%)	**224** **(78.6%)**	59 (20.7%)	285
10316.4-33783.9	0 (0%)	0 (0%)	0 (0%)	5 (1.81%)	**272** **(98.19%)**	277
Total	270 17.83	294 19.42	320 21.14	299 19.75	331 21.86	1,514 100

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Besides reiterating the important per capita income differences that exist among the NUTS-3 level regions, this table also indicates that these groups are largely stable in the cross-section and over the studied period. We observe that nearly 76% of the lagging regions remain in the category of lagging regions and even in the instances when they deviate from their group, this is often only for a one-year period, after which they return to the group of lagging regions. Comparably high levels of stability can be found in the other quantiles as well, with some tendency towards downward sloping, which is a further indication of the increasing distances between lagging and leading regions. Even more striking is the case of the leading regions, which keep their positions in slightly over 98% of the cases. In none of the observations were there any major jumps from one quantile to another, which again suggests the existence of stable groups that could be considered, based on their growth performance, to form stable convergence clubs. The most representative year for the structure of the identified convergence clubs for the 190 NUTS-3 level regions under study is 2001.

The cluster distribution for this year is shown in table 28. This table indicates that the group of leading regions includes almost all capital cities in the region (the exception being Sofia, which ranks in the second quintile), while the second highest group includes the major regional growth poles with most of the NUTS-3 regions from the Czech Republic and Slovenia. As a confirmation of the OLS regressions, most of Bulgarian and Romanian regions are located in the two bottom quintiles. None of the Czech, Hungarian and Slovenian regions can be found in the bottom two quintiles.

It is notable that despite the country homogeneity of the two bottom quintiles, there is important country heterogeneity in the distribution of regions in the case of the other three quintiles.

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Table 28. Convergence clubs at the NUTS-3 level regions

country	[2849.3-4605.4]	[4623.4-6222.9]	[6238.4-8077.4]	[8099.7-10850.7]	[10900.7-28064.1]	Total
			5 quantiles of GDP01			
Bulgaria	Blagoevgrad, Dobrich, Pazardzhik , Kardzhali, Montana, Sliven, Pernik Yambol, Haskovo, Targovishte, Vidin, Shumen	Veliko Tarnovo, Ruse, Gabrovo, Kyustendil, Smolyan, Pleven, Plovdiv, Sofia, Razgrad, Burgas, Lovech	Varna, Stara Zagora, Vratsa	**Sofia (stolitsa)**	-	28
Czech Republic	-	-	-	Karlovarský, Olomoucký, Ústecký, Moravskoslez	Zlínský, Stredoceský, Královehradecký, Liberecký, Pardubický, Jihocecký, Plzenský, Jihomoravský, **Hlavní mesto Praha**, Vysocina	14
Estonia	-	Kirde-Eesti, Kesk-Eesti, Louna-Eesti	Lääne-Eesti	-	**Pohja-Eesti**	5
Latvia	Latgale, Vidzeme, Zemgale	Pieriga	Kurzeme	-	**Riga**	6
Lithuania	-	Taurages, Siauliu, Marijampoles	Panevezio, Utenos, Telsiu, Alytaus	Klaipedos, Kauno	**Vilniaus**	10
Hungary	-	-	Bács-Kiskun, Szabolcs-Szatmár-Bereg, Békés, Nógrád, Borsod-Abaúj-Zemplén	Hajdú-Bihar, Csongrád, Tolna, Pest, Jász-Nagykun-Szolnok, Baranya, Somogy, Heves, Veszprém, Zala	Komárom-Esztergom, **Budapest**, Gyor-Moson-Sopron, Fejér, Vas	20

Country						
Poland	-	Nowosadecki, Krosniensko-przemyski, Chelmsko-zamojski, Elcki	Gdanski, Torunsko-wloclawski, Piotrkowsko-skierniewicki, Opolski, Ostrolecko-siedlecki, Elblaski, Lubelski, Lomzynski, Bialskopodlaski, Krakowsko-tarnowski, Lódzki, Koszalinski, Bialostocko-suwalski, Kaliski, Radomski, Swietokrzyski, Jeleniogórsko-walbrzyski, Rzeszowsko-tarnobrzeski, Slupski, Wroclawski, Koninski	Bielsko-bialski, Bydgoski, Centralny slaski, Poznanski, Szczecinski, Gorzowski, Olsztynski, Zielonogórski, Warszawski, Ciechanowsko-plocki, Czestochowsk, Pilski, Rybnicko-jastrzebski	**Miasto Warszawa**, Legnicki, Miasto Wroclaw, Miasto Kraków, Miasto Lódz, Miasto Poznan, Gdansk-Gdynia-Sopot	45
Romania	Alba, Bihor, Bistrita-Nasaud, Botosani, Brasov, Calarasi, Cluj, Dolj, Maramures, Mures, Olt, Dâmbovita, Sibiu, Silistra, Neamt, Suceava, Satu Mare, Ialomita, Mehedinti, Vaslui, Salaj, Giurgiu, Teleorman	Constanta, Arad, Hunedoara, Vrancea, Prahova, Harghita, Braila, Caras-Severin, Tulcea, Covasna, Bacau, Galati, Arges, Gorj, Vâlcea	Iasi, Timis, Buzau	Ilfov	**Bucuresti**	42
Slovenia	-	-	-	Pomurska	Zasavska, Goriska, **Osrednjeslovenska**, Podravska, Gorenjska, Jugovzhodna Slovenija, Obalno-kraska, Notranjsko-kraska, Spodnjeposavska, Savinjska, Koroska,	12
Slovakia	-	Presovský kraj	-	Kosický kraj, Trencianský kraj, Banskobystrický kraj, Nitrianský kraj, Trnavský kraj, Zilinský kraj	**Bratislavský kraj**	8
Total	38	38	38	38	38	190

These differences could not be observed by the estimation results of the pooled OLS regression or by the two variants of the least square dummy variable models. In the case of classical OLS, the goodness-of-fit statistics serves the purpose of verifying whether variations of the residuals are correlated to the variations of the independent variable. However, the goodness-of-fit statistics fails to account for deviations of the residuals from the supposed normal distribution. In order to improve the explanatory power of the initial linear regression model, I verify whether regression results suffer from the omitted variable bias, the existence of outliers, and heteroscedasticity. No severe outliers can be found, but the residuals of the country dummy model are not normally distributed, as shown in figure 24.

Figure 24. Kernel density functions constraint LSDV
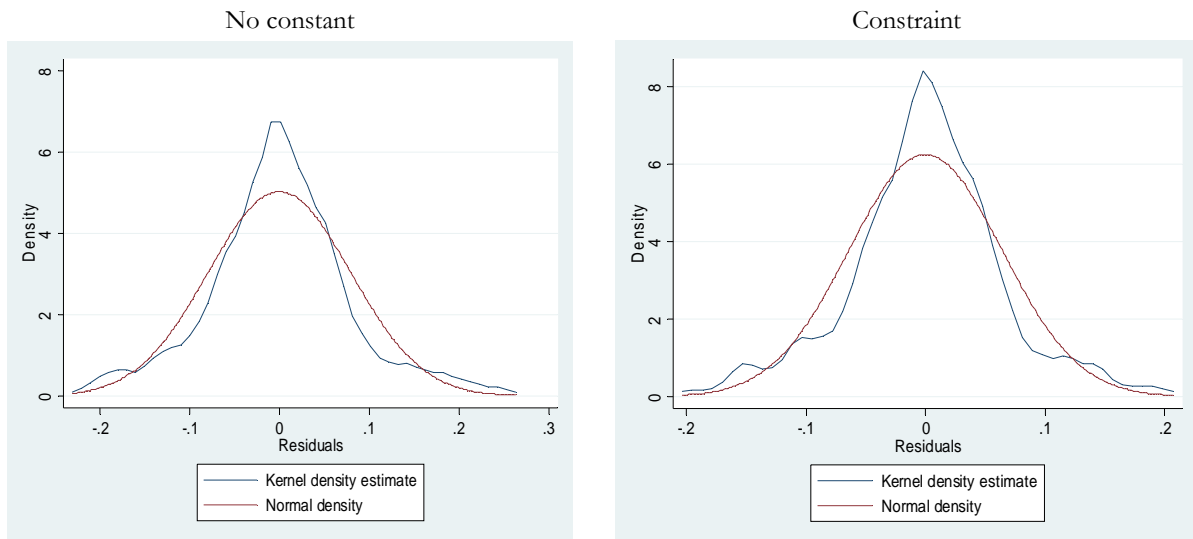
These findings, considered together with the theoretical expectations of growth slowdown in the case of regions that are already in the proximity of their steady state, suggest the need to assess the different quintile groups separately, as the goodness-of-fit

statistics of the classical unconditional mean based OLS regression could conceal possible important growth processes in the different subgroups.

7.6 Quantile regression analysis

In this section I turn to verify whether the initial level of per capita income is a substantial proxy for growth rate performance at the level of NUTS-3 regions under conditions of a heterogeneous panel. For this, I apply the least-absolute value model approach to improve the results of the classical OLS regression. Compared to OLS, the advantage of the quantile regression model is that it uses the conditional median function of the defined groups instead of the unconditional mean that allows assessing whether there are any growth performance differences among groups of regions with different initial per capita income levels.

The quintiles are chosen so that they capture the supposed dispersion of per capita income growth rates along the initial level of per capita income. In this way, the existence of differentials can be verified not only at the extremes (lagging and leading regions), but also in intermediary cases. The quintiles approach also allows for evaluating the dynamics of the relationship over time. Once these quintiles have been defined, I apply the least-absolute value model approach to group estimations. The quantile regression estimates results are reported in table 29.

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Table 29. Quintile regression growth estimates

	constant	*Initial per capita income*
OLS	.918 (22.98)***	-0.081 (-18.01)***
q20	-.399 (.044)***	-.031 (.005)***
q40	.621 (.051)***	-.051 (.006)***
q60	1.047 (.051)***	-.093 (.007)***
q80	1.227 (.050)***	-.107 (.006)***
q95	1.213 (.127)***	-.095 (.014)***
Statistical significance at: * p<10, ** p<.05, *** p<.01, ****p<.001		

The graph representation of the regression results (see figure 25) indicates that the quantile regression provides a slightly different regression line compared to the one produced by the pooled OLS regression. This very suggestive graph shows that while the growth performance of the regions in the two extreme quintiles is actually higher than that estimated by the pooled OLS regression and that the growth performance of the regions in the middle quintile is lower.

This finding is of special importance for identifying the potential beneficiaries of the new context in which the regions in the CEE-10 countries find themselves. Thus, leading capital city regions are undoubtedly beneficiaries of the institutional and policy reforms. At the same time, lagging regions also seem to significantly benefit from these reforms.

The picture becomes fuzzy in the case of middle-ranking regions and further analysis would be required to obtain a clearer picture. The evidence suggests that, as expected, the growth rate of middle-ranking regions is slower than that of lagging regions, but at the same time, they are outperformed by leading regions.

Figure 25. Pooled OLS and quintile regression
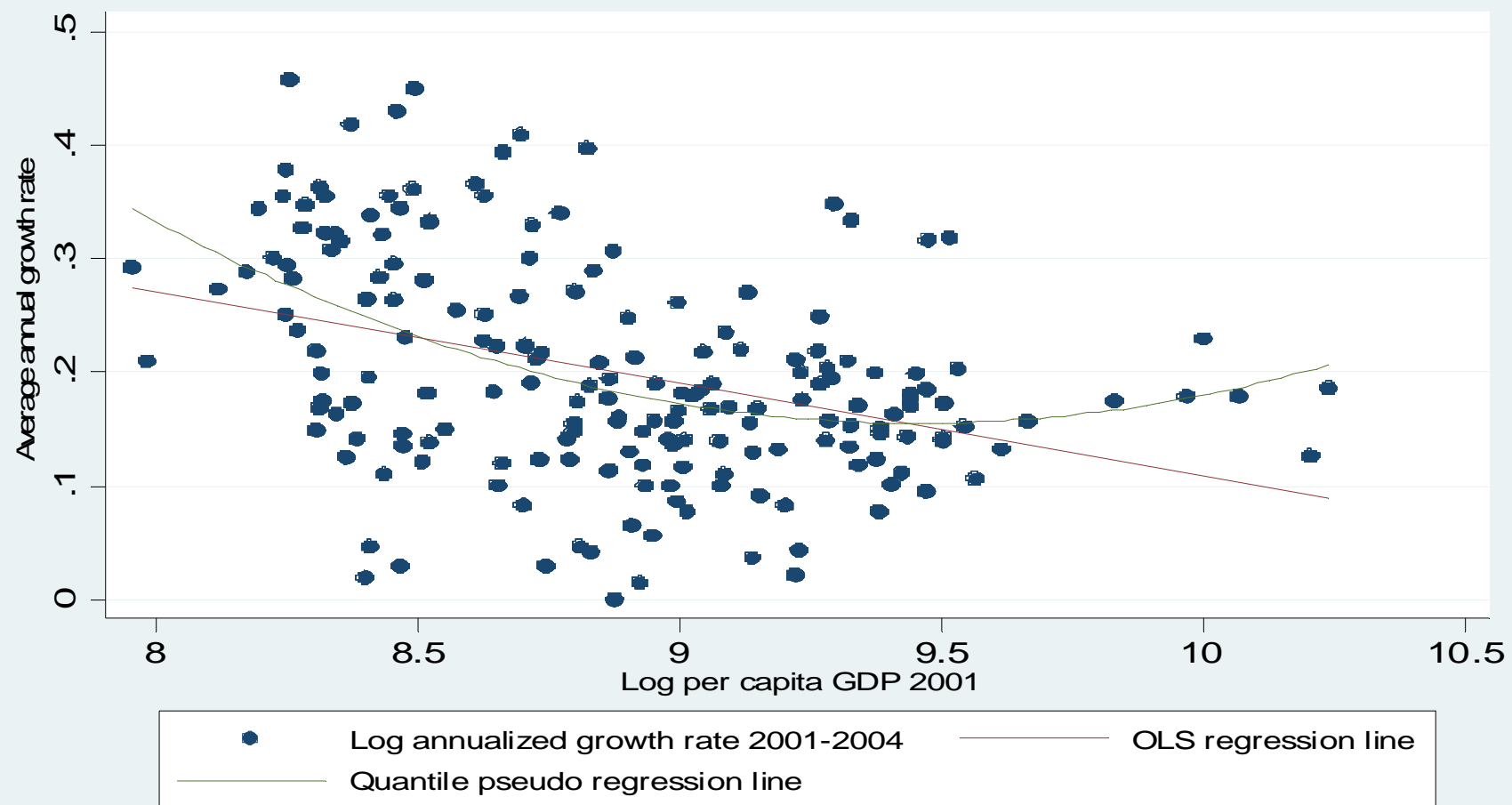
The main findings provided by the least-absolute value model approach can be interpreted separately for lagging, middle-ranking and leading regions in terms of per capita income. The quantile regression results indicate that in line with the provisions of the neo-classical growth theory, lagging regions belonging to the two bottom quintiles register the largest annualized growth rates compared to the other quintiles, i.e. they grow faster than the regions belonging to the other groups. At the same time, however, the assumption of the endogenous growth theory also seems to be supported in the sense that leading regions also keep growing at a high rate. What can be considered a surprising finding is that the regions belonging to the middle quintiles have very heterogeneous growth performances.

7.7 Summary

In this chapter the unconditional and conditional β-convergence and σ-convergence hypotheses were tested at national, NUTS-2 and NUTS-3 levels for different time periods.

Based on the findings of the dissertation, the hypothesis of unconditional β-convergence can be rejected for the whole period under study as well as for each of the three sub-periods. Country level pooled OLS estimates indicate the presence of per capita GDP income divergence for the period 1991-2005, and the annual rate of unconditional β-divergence among the CEE-10 countries was 1.23%, significant at the .001 level. In terms of conditional β-convergence, for both NUTS-2 and NUTS-3 level country dummy coefficients indicated important and statistically significant country group deviations from the average group effect. After controlling for country fixed effects in all NUTS-2 level models, the results of the OLS regressions were either

reversed or substantially tempered, and similar results were obtained for the case of NUTS-3 level regions. The theoretical interpretation of these results is that while a considerable share of variation takes place between-countries, a large part of it can be explained by variations among regions within the same country.

By applying the method of coefficient of variation, I have found that periods of convergence/ divergence can be distinguished also in this case. Based on these findings, it can be concluded that following periods of divergence, starting with 1999 σ-convergence can be observed in the case of the CEE-10 countries. At the same time, however, within-country the general tendency seems to be divergence.

Because the findings of the convergence tests pointed to the presence of parameter heterogeneity in the sample, I tested for the presence of convergence clubs, which have been found to exist at the NUTS-3 level.

The findings were evaluated using different modeling methods and regression diagnostics to assess the extent to which different methods produce reliable estimates. The results point to serious pitfalls, such as parameter heterogeneity, and the violation of general OLS regression assumptions. This indicates that classical regression analysis might need to be reconsidered as the main method to conduct convergence tests.

Chapter 8. Conclusions

This concluding chapter reviews the main findings of the dissertation. Building on the results of the analysis on the CEE-10 countries, I also describe the possible contributions of the dissertation to the body of empirical and theoretical knowledge on the linkages between institutions and growth performance. Last but not least, I discuss the limitations of this work, with emphasis on opportunities for future analysis, both theoretical and especially empirical, on the role of institutions in terms of growth performance.

This dissertation proposed to apply both qualitative and quantitative methods to analyze the relationship that is hypothesized by the growth literature to exist between steady state levels and institutional reforms. According to this, as a result of the reduction or elimination of both market and government imposed distortions through carrying out large scale macro-economic and institutional policy reforms, the steady state levels of per capita GDP income across different economies become similar or more homogeneous. The empirical prediction in the neo-classical growth models is that economies that are further away from their steady state level would grow at a faster pace, and thus economic convergence would be observed. In contrast, the endogenous growth models predict divergence claiming that richer economies tend to grow faster than poor ones, so inequality continues to increase.

Starting from this core theoretical context, discussed in details in chapter 2, the empirical analysis of the macro-economic policy reforms (chapter 4) indicates that these are systematically and positively associated with growth performance in the case of the CEE-10 countries. An important finding of this dissertation is that the definitory factor that influences the growth performance of the countries under focus is the extent of reforms rather than their timing. Thus, later reforming countries, such as Bulgaria and Romania, registered comparably high growth rates following the implementation of reforms as early reformers did starting with the early 1990s. We could observe, however, that although the reforms implemented are undeniably fundamental, the CEE practice in most policy fields is still at a certain distance from what could be considered standard practice in industrialized market economies. Thus, as the analysis carried out in this dissertation shows, the registered growth rates – although sufficient to reduce the relative developmental gap between the EU-15 countries and the CEE-10 countries – are insufficient to reverse the widening of the absolute per capita GDP income gap.

8.1 Empirical results

In this section, I present the main findings along the six research questions related to the effects of institutional factors on per capita GDP income convergence processes in the CEE-10 countries.

RQ1. *Have macro-economic policy reforms carried out in the CEE-10 countries in the transition period significantly induced per capita GDP income growth?*

The analysis indicates that all CEE-10 countries carried out comprehensive macro-economic policy reforms in all fields and as an outcome, all severe rigidities were

eliminated. However, the reform strategies adopted varied in timing and scale. In terms of timing, in line with the literature, two main country groups could be distinguished, that of early reformers and that of late reformers. In what regards the scale of reforms, important advances were made in the fields of price liberalization and trade openness, where all CEE-10 countries can be considered to have developed policy practice at standards comparable to those in Western European countries. Yet, in the remaining fields in none of the countries under study can we consider policy related rigidities completely eliminated. Thus, the least advances were made in terms of reforms in the fields of competition policy, enterprise restructuring and overall infrastructure policy. The limited scale of the reforms implemented in these fields could be interpreted as a possible source of a fundamental policy-making division between the EU-15 and the CEE-10 countries, as the remaining policy rigidities are likely to lead to institutional under-performance in the new member states of the EU.

In terms of the explained variable, per capita income growth, all countries (with the exception of Poland) registered decrease in the first period of transition. In the second period they already registered growth, with the exception of the late reformers (i.e. Bulgaria and Romania), while in the last period all countries registered sizeable growth rates. Taking the reform period as a whole, all the CEE-10 countries registered considerable per capita GDP income growth rates, successfully doubling per capita GDP income in a relatively short period of time. Thus, compared to EUR 5,520 per capita GDP (PPS) in the year 1991, the countries included in our sample reached an average of EUR 11,700 per capita GDP (PPS) in the year 2005.

When comparing the per capita income growth of the CEE-10 countries to the group of the EU-15 we could observe that while in the period 1991-1995 the EU-15 registered an annual 1.5% growth rate, the CEE-10 had a -1.0% annualized growth.

Nevertheless, in the period 1996-2000 the CEE-10 group already registered an annualized growth rate of 3.5%, which surpasses the results of the EU-15's 2.8%. In the period 2001-2005, growth in the CEE-10 region was maintained and slightly increased to 3.9%, while the growth rate of the EU-15 decelerated, being 1.5%. I have found that in comparison with the EU-15, the sustained higher growth rates of the CEE-10 countries reduced the relative difference of per capita GDP (PPS) over the period under study. More precisely, while in 1991 the average per capita GDP in the CEE-10 countries was approximately 35% of the average in the EU-15 countries, by 2005 it represented 46%. Yet, in absolute terms the gap between the two country groups widened, as the difference in average per capita GDP income grew by EUR 3,250, or 24% compared to the beginning of the period.

It might seem paradoxical that while in relative terms the group of the CEE-10 countries annually approach the average of the group of the EU-15 by 0.73%, in absolute terms the per capita GDP (PPS) gap between the two country groups continues to widen in average by nearly EUR 217 per year. This suggests that even if the average annual growth rate in the CEE-10 countries over the period 1991-2005 was sufficiently large to start recovering some of the difference, it is still smaller than what would be required for the start of the unconditional convergence process. The implication of this nuanced result is that further growth acceleration is needed in the CEE-10 countries. Besides the worries related to the sustainability of current growth rates, the fragility of this relative convergence is also highlighted by the slow growth in the EU-15 countries. In the circumstance in which the growth rates in the EU-15 would accelerate even marginally this would require even larger growth acceleration in the CEE-10 countries.

For the verification of my first hypothesis, regression analysis was conducted. The results (presented in table 8, chapter 4) indicate that the simple single equation model, which includes the seven macro-economic policy reform variables (i.e. privatization of state owned enterprises, the restructuring of enterprises, trade and price liberalization, the reform of competition policy, banking reform, and overall infrastructure reform), for the period 1990-2004, explains 26% of growth variation, and that it is significant at the .01 level.

RQ2. *Have European accession related conditionalities significantly influenced the design of regionalization processes in the CEE-10 countries?*

The second hypothesis relates to the scale of reforms carried out in the field of regional policy. Here the evidence contradicts most of the literature and indicates that neither EU accession conditionalities, nor the other instruments employed by the European Commission proved to be sufficiently influential to supersede domestic political and policy considerations. More precisely, I have found that the enrooting of new meso-level institutional structures in the CEE-10 countries – although it occurred in the context of European accession – was only limitedly influenced by the accession conditionalities formulated by the EU.

The limited interest in the CEE-10 countries to develop extensive regional governance structures by creating new autonomous sub-national governance structures doubled by the often contradictory and many times unofficial requirements by the European Commission during negotiations has led to a weak institutionalization of meso-level governments if compared to the institutional and policy structures within EU-15 countries.

The unintended consequence of the often contradictory positions of the European Commission on the extent of regionalization to be carried out has led to the adoption in the CEE-10 countries of a minimum approach, which fails to produce substantive administrative capacity development at meso-level. This can lead to the widening of regional disparity across the CEE-10 countries, given their limited capacity to undertake responsibilities related to development.

The analysis dealing with the CEE-10 countries' experiences in creating or reforming meso-level governments indicates that endogenous factors were determinant for institutional choices. As a result, the institutional standardization agenda of the EU through its accession conditionalities, at least in the field of regional policy, despite both formal and informal pressures seems to have failed to persuade the CEE-10 accession countries to adopt similar forms of regionalization. As an outcome, administrative capacity at the level of cohesion regions as promoted by the European Commission was only created to a limited extent. Even more, as it has been found, the adoption of administrative decentralization as the only form of regionalization has led to contrary results compared to those initially promoted by the European Commission, since many of the responsibilities related to the implementation of regional policy and the management of structural funds are maintained at the national government level.

We have seen that the only country in which real cohesion regions were created is Poland, where the meso-level government tier corresponds to NUTS-2 level cohesion regions. But even in this case the reasons of regionalization are attributable to domestic considerations and at a certain point the extent of decentralization was even criticized by the European Commission. The counter-example is the Slovak Republic, where cohesion regions have no independent powers. Even in other countries, such as Hungary, where cohesion regions were endowed with more administrative and policy

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capacities, the central government retains important leverages over regional decision-making, through representation in decision-making councils and financial transfers.

RQ3. *Is there unconditional β-convergence across the CEE-10 countries?*

The comparably similar outcomes of macro-economic stabilization reforms carried out in the CEE-10 countries and their established link with growth performance suggest the possibility of these countries converging to similar steady state levels of per capita GDP income. To verify whether this possibility has materialized in the case of the CEE-10 countries the unconditional β-convergence hypothesis was tested. According to this, if countries and regions are different only in the initial per capita GDP level once policy and institutional related government distortions eliminated (or became similar), these units will converge to comparably similar steady-states, and as a result we would observe that poorer economic units have higher growth rates.

Based on the findings of the dissertation, the hypothesis of unconditional β-convergence can be rejected for the whole period under study as well as for each of the three sub-periods. Country level pooled OLS estimates indicate the presence of per capita GDP income divergence for the period 1991-2005, and the annual rate of unconditionalβ-divergence among the CEE-10 countries was 1.23%, significant at the .001 level, which implies a doubling of the existing per capita disparities in 56 years. Thus, while in the period 1991-1995 the annual rate of per capita income divergence among the CEE-10 countries was 5.79% (a doubling in 12 years), in the period 2001-2005 the rate of divergence was somewhat slower of about 3%, which implies a doubling of disparities every 24 years.

As the hypothesis of unconditional β-convergence is rejected, the response to the research question is that despite comparable policy reforms carried out in all CEE-

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10 countries, there are still important differences in terms of government imposed distortions that make the steady-state levels of these economies to be substantially different.

RQ4. *Is there conditional β-convergence among NUTS-2 and/ or NUTS-3 levels in the CEE-10 countries?*

Once rejecting the unconditional β-convergence hypothesis for the CEE-10 countries, I evaluated the impact of the different country effects on the growth performance of NUTS-2 and NUTS-3 level sub-national regions. In this modeling context, the hypothesis was that after controlling for country fixed effects, both in the case of NUTS-2 and NUTS-3 levels, regions with lower per capita GDP income at the beginning of the period under analysis would exhibit higher grow rates than higher per capita GDP income regions.

For both NUTS-2 and NUTS-3 levels country dummy coefficients indicated important and statistically significant country group deviations from the average group effect. Even more, after controlling for country fixed effects in all NUTS-2 level models, the results of the OLS regressions (i.e. high rates of divergence) were either reversed or substantially tempered, and similar results were obtained for the case of NUTS-3 level regions. The theoretical interpretation of these results is that while a considerable share of variation takes place between-countries, a large part of it can be explained by variations among regions within the same country.

RQ5. *If there is β-convergence among the CEE-10 countries at national and sub-national levels, could σ-convergence be also observed at any of these levels?*

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The results from the conditional β-convergence tests at subnational level created the theoretical possibility of σ-convergence among these regions. By applying the method of coefficient of variation, I have found that similarly to conditional β-convergence, we can distinguish periods of convergence/ divergence also in this case. Thus, at the national level (figure 22, chapter 7) the coefficient of variation calculated for the period 1991-1994 showed a steady increase, while in the period 1995-1998 there was a mixed picture with both increase and decrease, and starting with 1999 we could observe a steady process of decrease of per capita GDP dispersion among countries. Based on these findings, we can conclude that following periods of divergence, starting with 1999 σ-convergence can be observed in the case of the CEE-10 countries. At the same time, however, within-country the general tendency seems to be divergence (figure 23, chapter 7). Therefore we can talk about increasing within-county disparities despite a more homogeneous between-country per capita GDP income distribution.

Overall, the findings of the convergence tests point to the presence of parameter heterogeneity in the sample, which I verified through various regression diagnostics techniques. The most important finding is that robust convergence clubs were found to exist at the NUTS-3 level. Thus, while there are steady state differences in the sample, there are also NUTS-3 level fixed effects. The convergence club estimation results support the presence of sample segmentation by the initial per capita GDP level and not along country fixed effects. Thus, high end regions (capital city regions) and bottom end regions (mostly in Bulgaria and Romania) exhibit comparably high growth rates, while middle ranking regions' growth rates do not seem to be linearly related to initial income levels. The results also indicate the presence of between-country convergence clubs, as nearly 76% of the regions that were lagging at the beginning of the period

remained lagging regions at the end of the period, and more than 98% of the leading regions remained leading regions over the period.

RQ6. *Do OLS regressions produce different convergence rates predictions depending on the level of data aggregation and sample selection?*

As seen above, despite highly statistically significant and considerable country dummy effects identified the tests of conditional β-convergence therefore the results of the OLS regression cannot be considered robust as the predicted convergence/ divergence rates vary with the model specification, the level of analysis, and also with the time period covered. Thus, while pooled OLS regression indicates at NUTS-2 level for the period 1998-2004 an annual .38% divergence, LSDV regression shows a 2% convergence rate. When considering the shorter period between the years 2001 and 2004, the extent of per capita GDP divergence estimated by the LSDV is four times smaller than in the case of pooled OLS regression. At NUTS-3 level, pooled OLS and LSDV results for the period 1998-2004 are very similar, so overall country effects seem to be limited. Yet, for the period 2001-2004 the two methods estimate contrary results. Thus, while pooled OLS predicts a 1.93% annual divergence rate, LSDV regression predicts an annual .63% convergence rate. By controlling for country fixed effects, LSDV regression produces more accurate estimations. According to these, in the period 1998-2004, the NUTS-2 level regions were converging at an annual rate of 2%, while the NUTS-3 level regions were diverging at a rate of .16%. These indicate that while cohesion regions were becoming more homogeneous in terms of per capita GDP income, the highest level local authority regions were becoming more heterogeneous. In the case of the shorter period 2001-2004 the findings indicate that at NUTS-2 there is

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annual per capita GDP income divergence of .39%, while at NUTS-3 levels there is an annual .63% convergence.

The robustness tests carried out indicate that despite its wide application in convergence testing, OLS regression suffers from a series of weaknesses that are likely to produce incorrect regression estimates. For instance, the chi-square goodness-of-fit measure tests indicate that the standard data transformation procedure (i.e. log transformation) to enhance the normal distribution of variables generally used in linear regression analysis is not always the most effective transformation available. For instance, while in the case of NUTS-3 level regions' per capita GDP income for the years 1998 and 2001 taking the log is the most effective transformation, in the case of the year 1995 the reciprocal root would have been most effective.

All in all, we can conclude that generalizations made based on OLS regression estimates in the case of count data are vulnerable to conditions of panel heterogeneity, which could lead to misinterpretations (i.e. the role of outliers, observations with high influence and leverage). To exemplify these problems, I presented the regression results of the conditional median function of the defined convergence clubs instead of the unconditional mean. These have revealed that the growth performance of the regions in the two extreme quintiles is actually higher than that estimated by the pooled OLS regression and that the growth performance of the regions in the middle quintile is lower. This allows separate interpretation for lagging, middle ranking and leading regions in terms of per capita income, which would motivate the adoption of this method for the analysis of growth processes in the case of heterogeneous panels.

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8.2 Contributions to the literature

The contributions of the dissertation to the body of knowledge on the role of institutions in generating growth are fourfold. First of all, the empirical findings suggest that macro-economic policy reforms can be linked directly to higher steady-states, and thus to the inducement of higher growth rates. The fact that in absolute terms the per capita income gap between the EU-15 and the CEE-10 regions continued to widen point to the need to further improve the institutional environment in order to accelerate current growth rates in the CEE-10 countries and to generate per capita GDP income convergence between the two country groups.

From a policy perspective the above highlight the perception problem that is widely spread among the leaders of the CEE-10 countries, according to which current growth performances lead to convergence. Current per capita GDP income growth rates in the CEE-10 countries, although they report robust annual expansion, should not be misinterpreted as already leading to income convergence. Therefore, following the EU accession of the CEE-10 countries the debate about measures to boost the speed of per capita GDP income growth needs to be rephrased in terms of policy measures addressing the widening per capita GDP income gap among the CEE-10 countries and between the EU-15 and the CEE-10 countries. If solutions are not identified, the most likely result will be the entrenchment of the existing divisions between the two regions.

The second contribution emerges from the simultaneous analysis of institutionalization and convergence/ divergence processes at the level of both the cohesion regions and meso-level governments. It has been found that under conditions of weak EU conditionalities in the accession process, cohesion (NUTS-2) regions were designed so that national level regional divergence processes should be veiled. This hypothesis was not only verified, but in the case of the CEE-10 countries different

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convergence/ divergence results were obtained depending on the level of analysis. Such finding could be of major importance for the identification of the appropriate level of analysis when evaluating convergence rates in the EU-27 countries. Restraining the analysis to only the national level and neglecting sub-national processes could be misleading from the perspective of the long-term growth prospects of the given economies. From the perspective of the economic performance dimension, I have found that weak meso-level institutions limit the scope of regional policy in the CEE-10 countries, the outcome being a more unbalanced growth path of regions. The implication of this finding is that an increase of economic divergence can be observed among the regions in countries with weaker meso-level governments.

The third contribution of the dissertation to the growth literature is related to the presence of sample segmentation that leads to the question of whether there are stable convergence clubs in the sample of countries and/ or regions. The results of the income convergence tests at all three levels and in different periods suggest that overall the underlying growth model in the CEE-10 countries is of endogenous type. This, however, is further refined by the fact that five robust convergence clubs were identified, which point to sample segmentation. Quantile regression suggests that both the bottom and the top end convergence clubs exhibit important growth performances, while the three middle ranking clubs are underperforming. Thus, in the case of the bottom club we could observe that growth is of neo-classical type, in the case of the top club it is of endogenous type, and in the case of the three middle ranking clubs the picture is fuzzy and highly individual-invariant specific.

In terms of the objectives of the research, the scope was not only to find empirical evidence that institutions do matter, but also to provide insights into the ways in which they actually matter for the growth performance of regions. This is even more

relevant considering that the objectives of the EU are not to promote growth in some regions, but to alleviate structural and institutional problems. The fact that middle ranking regions underperform leading regions is a strong indication that newly established regional institutions are only limitedly able to foster growth. In terms of the convergence literature, this indicates the emergence of robust convergence clubs, which not only reiterates existing regional disparities among clubs, but points to their deeper entrenchment.

8.3 Limitations and future research

The results are limited by three factors. The first and foremost limitation regards the nature of comparable data. The period under investigation is limited to a maximum of fifteen years, which might not be sufficient to accurately forecast long-term growth volatilities in the case of the CEE-10 countries. This period is further narrowed as sub-national level data used. Yet, by adding new cases to the panel structure produce changes in measured convergence/ divergence rates. Therefore, to ensure consistency in the analysis for the case of NUTS-2 and NUTS-3 levels a number of six different regression models were estimated, so that the different influences to be captured. Although there were influences when including or eliminating sub-sets of cases in none of the case these changes influenced the sign of the relations, but only its strength.

The second limitation emerges from the problem of limited degrees of freedom. In the case of national level analysis the universe of acceding countries with similar initial macro-economic policy environment is limited to ten, which in the case of a fifteen years period represents only one-hundred fifty observations. This limited number of data points severely limits the number of dummy variables that can be

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included in the model in order to control for various national peculiarities, such as size of the economy, geographic variables, cultural indicators. The same problem can be observed in the cases of NUTS-2 and NUTS-3 level models, where although the number of observations increase, despite shorter time periods the figures remain relatively small. In what concern the results, the attempts to model parameter heterogeneity in the different approaches introduced could also be biased by relatively short time period considered. The main solution to this problem is to include longer time periods, but this can be done only at a late time.

The third limitation regards the possible complexity of the interaction between institutional/ policy variables and growth rates. Although the panel structure of the data captures some of this efforts were made to capture the structural differences of country development that characterize levels of per capita GDP income. These different statistical methods confirm the parameter heterogeneity problem To address this from the different evolutions of European accession negotiations that possibly mask the influence these have on growth rates.

An important avenue for further research is to expand along the different underlying growth models that were observed at the level of different convergence clubs. Especially fruitful would be to carry out detailed analysis on the causes of the high range of growth performance of middle ranked converge clubs. The fact that middle ranking regions are overall underperforming to the top end club represents an important theoretical and policy relevant issue for avoiding growth deceleration.

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Appendices

Table 30. Per capita GDP EU-27 countries

In PPS, 2004

		GDP, Mio. PPS	GDP per capita	GDP per capita, EU27=100
	Eu27	10 529 351	21 503	100.0
1	Austria	226 163	27 666	128.7
2	Belgium	278 748	26 759	124.4
3	**Bulgaria**	**55 510**	**7 134**	**33.2**
4	**Czech republic**	**165 059**	**16 171**	**75.2**
5	Cyprus	14 536	19 648	91.4
6	Denmark	144 648	26 772	124.5
7	**Estonia**	**16 242**	**11 978**	**55.7**
8	Finland	129 816	24 834	115.5
9	France	1 504 876	24 146	112.3
10	Germany	2 054 543	24 903	115.8
11	Greece	201 864	18 245	84.8
12	Ireland	123 456	30 414	141.4
13	Italy	1 343 554	23 095	107.4
14	**Latvia**	**22 608**	**9 775**	**45.5**
15	**Lithuania**	**37 732**	**10 981**	**51.1**
16	Luxembourg	24 468	53 978	251.0
17	Malta	6 414	15 988	74.4
18	Netherlands	454 847	27 946	130.0
19	**Hungary**	**138 986**	**13 751**	**64.0**
20	**Poland**	**416 484**	**10 908**	**50.7**
21	Portugal	168 936	16 086	74.8
22	**Romania**	**158 230**	**7 301**	**34.0**
23	**Slovenia**	**35 791**	**17 920**	**83.3**
24	**Slovakia**	**65 644**	**12 196**	**56.7**
25	Spain	924 629	21 658	100.7
26	Sweden	232 632	25 865	120.3
27	United Kingdom	1 582 935	26 455	123.0

Source: Eurostat, New Cronos Database

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005

Table 31. Per capita GDP CEE-10 countries, period 1991-2005

In PPPs, EURO

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Bulgaria	5,070	4,760	4,610	4,580	4,790	4,750	4,460	4,360	4,640	4,900	5,330	5,840	6,090	6,470	6,920	7,530
Czech Rep.	9,810	9,150	9,370	9,420	9,820	9,970	11,560	11,800	11,920	12,420	13,040	13,730	14,580	14,860	16,000	17,360
Estonia		5,690	5,120	4,810	5,100	5,210	5,700	6,570	7,050	7,320	8,260	9,130	10,090	10,960	12,090	14,120
Hungary	7,800	7,290	7,350	7,370	7,740	7,470	7,900	8,490	9,090	9,740	10,550	11,860	12,720	13,090	13,820	14,410
Latvia	6,690	6,880	4,890	4,450	4,710	4,540	4,920	5,520	5,940	6,420	7,020	7,730	8,330	8,880	9,710	11,060
Lithuania	8,240	8,170	6,630	5,610	5,200	5,030	5,650	6,250	6,880	6,990	7,620	8,370	9,020	9,840	10,840	12,190
Poland	4,610	4,500	4,740	4,930	5,280	6,120	6,860	7,540	8,050	8,640	9,400	9,600	9,980	10,210	11,070	11,690
Romania	4,470	4,100	3,920	4,000	4,250	4,620	4,970	4,800	4,660	4,770	5,010	5,460	6,060	6,520	7,290	8,140
Slovakia	6,690	6,030	5,780	5,570	6,700	6,770	7,410	7,940	8,410	8,750	9,470	10,150	10,990	11,290	12,010	12,900
Slovenia	9,980	9,520	9,300	9,650	10,380	9,710	11,230	12,110	12,830	13,870	14,640	15,400	16,040	16,510	17,980	18,900
CEE-10		5,520	5,460	5,510	5k840	6,200	6,840	7,210	7,540	7,970	8,590	9,100	9,680	10,040	10,880	11,700
EU-15		15,880	16,500	16,510	17k250	17,010	17,810	18,740	19,570	20,640	22,010	22,730	23,400	23,600	24,520	25,310

Source: wiiw Countries in Transition

Table 32. Coefficient of variation overall infrastructure investment index

Year	Mean	Std. Dev.	Co. Var.	Min	Max	Obs
1990	1.2	0.449419	37.45	1	2.33	10
1991	1.401	0.584873	41.75	1	2.67	10
1992	1.5	0.707107	47.14	1	3	10
1993	1.667	0.684577	41.07	1	3	10
1994	1.734	0.643604	37.12	1	3	10
1995	2.033	0.692484	34.06	1	3.33	10
1996	2.399	0.465772	19.42	2	3.33	10
1997	2.465	0.421644	17.11	2	3.33	10
1998	2.532	0.450082	17.78	2	3.33	10
1999	2.631	0.429275	16.32	2.33	3.33	10
2000	2.698	0.429361	15.91	2.33	3.33	10
2001	2.731	0.439531	16.09	2.33	3.33	10
2002	2.731	0.439531	16.09	2.33	3.33	10
2003	2.698	0.400189	14.83	2.33	3.33	10
2004	2.698	0.400189	14.83	2.33	3.33	10
2005	2.766	0.447939	16.19	2.33	3.67	10

Table 33. Between country per capita GDP variation for the 1990-2005 period

in PPS, EURO

	Mean	Std. Dev.	Co. Var.	Min	Max	Obs
Y1990	7040	2090.75	29.70	4470	9980	9
Y1991	6609	1921.98	29.08	4100	9520	10
Y1992	6171	1945.79	31.53	3920	9370	10
Y1993	6039	2060.14	34.11	4000	9650	10
Y1994	6397	2208.00	34.52	4250	10380	10
Y1995	6419	2046.71	31.89	4540	9970	10
Y1996	7066	2539.73	35.94	4460	11560	10
Y1997	7538	2674.99	35.49	4360	12110	10
Y1998	7947	2766.30	34.81	4640	12830	10
Y1999	8382	2991.76	35.69	4770	13870	10
Y2000	9034	3103.13	34.35	5010	14640	10
Y2001	9727	3205.09	32.95	5460	15400	10
Y2002	10390	3314.70	31.90	6060	16040	10
Y2003	10863	3275.86	30.16	6470	16510	10
Y2004	11773	3496.20	29.70	6920	17980	10
Y2005	12830	3597.21	28.04	7530	18900	10

Tabel 34. Within country variation of per capita GDP

Period 1991-2005, n=15

	Mean	Standard deviation	Coef. variation	Min	Max
Bulgaria	5335.33	996.34	18.67	4360	7530
Czech Republic	12333.33	2576.81	20.89	9150	17360
Estonia	7814.67	2888.92	36.97	4810	14120
Hungary	9926.00	2605.55	26.25	7290	14410
Latvia	6733.33	2050.07	30.45	4450	11060
Lithuania	7619.33	2126.26	27.91	5030	12190
Poland	7907.33	2411.21	30.49	4500	11690
Romania	5238.00	1247.64	23.82	3920	8140
Slovakia	8678.00	2371.59	27.33	5570	12900
Slovenia	13204.67	3255.94	24.66	9300	18900

Table 35. Annual Coefficient of Variation for each country period 1995-2004

Coefficient of variation, NUTS-3 level in Bulgaria for period 1995-2004
GDP per capita in PPS, EUR   n=28

	Mean	Std. Dev.	Co. Var.	Min	Max
1995	4160.111	1016.702	24.44	2865	8209.3
1996	3911.186	949.7922	24.28	2698.7	7683.6
1997	3933.182	898.4674	22.84	2816.9	6294.8
1998	4148.171	957.206	23.08	2906.9	7221.8
1999	4246.786	1096.268	25.81	2842.7	8505
2000	4642.196	1250.889	26.95	3275.9	8633.4
2001	5015.404	1389.968	27.71	3554	10605.4
2002	5159.379	1486.06	28.80	3844.4	11629.9
2003	5689.086	1595.96	28.05	4445.1	12511.7
2004	6028.682	1744.602	28.94	4702.4	13598.8

Coefficient of variation, NUTS-3 level in Czech Republic for period 1995-2004
GDP per capita in PPS, EUR   n=14

	Mean	Std. Dev.	Co. Var.	Min	Max
1995	10107.26	2274.67	22.51	8830.5	17866.4
1996	11000.29	2489.517	22.63	9668.9	19477.6
1997	11207.08	2814.331	25.11	9497.9	20814.4
1998	11278.6	3250.374	28.82	9499.3	22389.5
1999	11648.29	3593.293	30.85	9802.9	23938.5
2000	12245.48	3939.997	32.18	10047.2	25695.2
2001	12861.33	4448.3	34.59	10565.8	28064.1
2002	13633.79	4839.029	35.49	11063.9	30189.7
2003	14328.58	5128.995	35.80	11746.6	31879.4
2004	15195.81	5435.247	35.77	12634.9	33783.9

Coefficient of variation, NUTS-3 level in Estonia for period 1995-2004
GDP per capita in PPS, EUR   n=6

	Mean	Std. Dev.	Co. Var.	Min	Max
1995	4520.42	1514.249	33.50	3702.9	7217.1
1996	4946.14	1663.446	33.63	4043.3	7911.1
1997	5649.38	2130.798	37.72	4447.6	9439.2
1998	6016.74	2448.449	40.69	4574.3	10355.4
1999	6246.64	2463.117	39.43	4616.4	10593.2
2000	7171.88	3043.518	42.44	5461.3	12575.8
2001	7670.76	3352.182	43.70	5727.6	13621.1
2002	8423.02	3790.143	45.00	6148.5	15156.9
2003	9194.9	4350.998	47.32	6844.4	16961
2004	9915.98	4941.604	49.83	7157	18727.3

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Coefficient of variation, NUTS-3 level in Lithuania for period 1995-2004
GDP per capita in PPS, EUR   n=10

	Mean	Std. Dev.	Co. Var.	Min	Max
1995	4882.26	771.4507	15.80	3450.7	6148.9
1996	5301.27	828.3203	15.62	3811.1	6693.5
1997	5724.95	1109.819	19.39	3721.5	7841.2
1998	6237.67	1285.247	20.60	4061.5	8820.5
1999	6248.29	1390.474	22.25	4190.8	9136.9
2000	6762.08	1545.992	22.86	4648.4	10038.7
2001	7335.81	1821.748	24.83	5035.2	11288.8
2002	7797.82	2147.969	27.55	5168.9	12771.9
2003	8796.9	2490.971	28.32	5473.1	14520.4
2004	9525.71	2727.081	28.63	5780.3	15754.2

Coefficient of variation, NUTS-3 level in Latvia for period 1995-2004
GDP per capita in PPS, EUR   n=6

	Mean	Std. Dev.	Co. Var.	Min	Max
1995	3990.733	1608.753	40.31	2813.9	6824.8
1996	4337.067	1767.333	40.75	3053.6	7459.2
1997	4881.35	2009.785	41.17	3430.4	8436.3
1998	5109.917	2508.67	49.09	3349.5	9829
1999	5296.683	2870.483	54.19	3183.3	10849.4
2000	5865.817	3290.132	56.09	3420.1	12139.2
2001	6412.017	3427.549	53.46	4252.4	13059.2
2002	6760.417	4136.953	61.19	3981.5	14968.7
2003	7371.317	4234.911	57.45	4576.6	15714
2004	8003.867	5060.634	63.23	4541.1	17921

Coefficient of variation, NUTS-3 level in Hungary for period 1995-2004
GDP per capita in PPS, EUR   n=20

	Mean	Std. Dev.	Co. Var.	Min	Max
1995	6540.395	1900.079	29.05	4425.3	13490.7
1996	6821.59	2128.37	31.20	4461.2	14474.8
1997	7289.475	2431.824	33.36	4427.2	15727.4
1998	7877.68	2701.278	34.29	5108.6	16806.3
1999	8332.915	3026.198	36.32	5249.7	18333.3
2001	10038.07	3730.187	37.16	6586.8	23606
2002	10584	4257.365	40.22	6816.8	26574.9
2003	11141.68	4370.372	39.23	7114.2	26797.9
2004	11700.8	4563.101	39.00	7445.6	28231.6

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Coefficient of variation, NUTS-3 level in Poland for period 1995-2004
GDP per capita in PPS, EUR   n=45

	Mean	Std. Dev.	Co. Var.	Min	Max
1995	5713.823	1521.598	26.63	4037.6	10517.1
1996	6207.105	1586.443	25.56	4594.7	11351.8
1997	6838.482	1849.005	27.04	5074.4	13516.2
1998	7287.069	2075.121	28.48	5324.1	14963.6
1999	7646.079	2499.346	32.69	5064.3	16311.2
2000	8829.062	3788.341	42.91	5394.5	26372.5
2001	9034.651	3686.757	40.81	5745.5	27100.3
2002	9344.011	3994.448	42.75	5871.5	28460.2
2003	9538.8	4111.982	43.11	6088.6	29884.7
2004	10378.42	4373.817	42.14	6352.8	30733.3

Coefficient of variation, NUTS-3 level in Romania for period 1998-2004
GDP per capita in PPS, EUR   n=42

	Mean	Std. Dev.	Co. Var.	Min	Max
1998	4332.702	1082.968	25.00	2558	7917.7
1999	4330.157	1106.591	25.56	2775.9	8040.7
2000	4470.369	1464.139	32.75	2367.9	10594.4
2001	4877.205	1563.61	32.06	2849.3	11824.1
2002	5426.055	1870.61	34.47	2981.5	12852
2003	5860.233	1784.049	30.44	3430.7	13067.4
2004	6698.619	1971.314	29.43	3627.5	14424.6

Coefficient of variation, NUTS-3 level in Slovakia for period 1995-2004
GDP per capita in PPS, EUR

					n=8
	Mean	Std. Dev.	Co. Var.	Min	Max
1995	6963.688	3194.413	45.87	4383.5	14576.2
1996	7683.838	3401.7	44.27	4819.2	15760.7
1997	8170.388	3754.69	45.95	5067.2	17134.3
1998	8634.663	3982.918	46.13	5253.2	18154.9
1999	8919.313	4057.082	45.49	5333.1	18565.3
2000	9645.087	4519.026	46.85	5736.5	20437.1
2001	10306.44	4914.518	47.68	6120.4	22097.3
2002	11168.37	5542.586	49.63	6726.3	24565.6
2003	11692.1	5774.342	49.39	6891.8	25561.9
2004	12547.5	6330.131	50.45	7400.1	27801.6

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Coefficient of variation, NUTS-3 level in Slovenia for period 1995-2004
GDP per capita in PPS, EUR

n=12

	Mean	Std. Dev.	Co. Var.	Min	Max
1995	9494.883	1770.865	18.65	7932.9	14236.8
1996	10156.83	1898.839	18.70	8539.9	15223.4
1997	10991.22	2015.967	18.34	9267	16340.6
1998	11708.44	2131.127	18.20	9775.4	17401.6
1999	12447.45	2457.551	19.74	9809.6	19125.8
2000	13147.52	2575.301	19.59	10207.2	20182.7
2001	13774.9	2797.682	20.31	10751	21407.4
2002	14266.85	2963.913	20.77	11017.9	22348.8
2003	14796.26	3324.132	22.47	11395	23957.4
2004	15941.17	3517.431	22.07	12364.2	25595.8

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Table 36. Units of observation

Country	Development Region (NUTS-1)	Development Region (NUTS-2)	County/ district level (NUTS-3)
Bulgaria	Severna Bulgaria	Severozapaden	Vidin, Montana, Vratsa
		Severen tsentralen	Pleven, Lovech, Veliko Tarnovo, Gabrovo, Ruse
		Severoiztochen	Varna, Dobrich, Shumen, Targovishte, Razgrad, Silistra
	Yuzhna Bulgaria	Yugozapaden	Sofia (stolitsa), Sofia, Blagoevgrad, Pernik, Kyustendil
		Yuzhen tsentralen	Plovdiv, Stara Zagora, Haskovo, Pazardzhik, Smolyan, Kardzhali
		Yugoiztochen	Burgas, Sliven, Yambol
Czech Republic	Czech Republic	Praha	Hlavní mesto Praha
		Střední Čechy	Stredoceský
		Jihozápad	Jihocecký, Plzenský
		Severozápad	Karlovarský, Ústecký
		Severovýchod	Liberecký, Královehradecký, Pardubický
		Jihovýchod	Vysocina, Jihomoravský
		Střední Morava	Olomoucký, Zlínský
		Moravskoslezsko	Moravskoslezský
Estonia	Estonia	Estonia	Põhja-Eesti, Lääne-Eesti, Kesk-Eesti, Kirde-Eesti, Lõuna-Eesti
Latvia	Latvia	Latvia	Kurzeme, Latgale, Riga, Pieriga, Vidzeme, Zemgale
Lithuania	Lithuania	Lithuania	Alytaus, Kauno, Klaipedos, Marijampoles, Panevezio, Siauliu, Taurages, Telsiu, Utenos, Vilniaus – (apskritis)
Hungary	Közép-Magyarország	Közép-Magyarország	Budapest, Pest
	Dunántul	Közép-Dunántúl	Fejér, Kómárom-Esztergom, Veszprém
		Nyugat-Dunántúl	Györ-Moson-Sopron, Vas, Zala
		Dél-Dunántúl	Baranya, Somogy, Tolna
	Alföld és Észak	Észak-Magyarország	Borsod-Abauj-Zemplén, Heves, Nográd
		Észak-Alföld	Hajdú-Bihar, Jász-Nagykun-Szolnok, Szabolcs-Szatmár-Bereg
		Dél-Alföld	Bács-Kiskun, Békés, Csongrád
Poland	Centralny	Łódzkie	Lodzki, Piotrkowsko-skierniewicki, Miasto Lodz
		Mazowieckie	Ciechanowsko-plocki, Ostrolecko-siedlecki, Radomski, Warszawski, Miasto Warszawa
	Poludniowy	Małopolskie	Krakowsko-tarnowski, Nowosadecki, Miasto Krakow
		Śląskie	Czestochowski, Bielsko-bialski, Centralny slaski, Rybnicko-jastrzebski
	Wschodni	Lubelskie	Bialskopodlaski, Chelmsko-zamojski, Lubelski
		Podkarpackie	Rzeszowsko-tarnobrzeski, Krosniensko-przemyski
		Świętokrzyskie	Swietokrzyski
		Podlaskie	Bialostocko-suwalski, Lomzynski
	Polnocno-Zachodni	Wielkopolskie	Pilski, Poznanski, Kaliski, Koninski, Miasto Poznan
		Zachodniopomorskie	Szczecinski, Koszalinski
		Lubuskie	Gorzowski, Zielonogorski
	Poludniowo-Zachodni	Dolnośląskie	Jeleniogorsko-walbrzyski, Legnicki, Wroclawski, Miasto Wroclaw
		Opolskie	Opolski
	Polnocny	Kujawsko-Pomorskie	Bydgoski, Torunsko-wloclawski
		Warmińsko-	Elblaski, Olsztynski, Elcki
		Pomorskie	Slupski, Gdanski, Gdansk-Gdynia-Sopot
Romania	Romania	Nord-Est	Bacau, Botosani, Iasi, Neamt, Suceava, Vaslui
		Sud-Est	Braila, Buzau, Constanta, Galati, Tulcea, Vrancea
		Sud	Arges, Calarasi, Dambovita, Giurgiu, Ialomita, Prahova, Teleorman
		Sud-Vest	Dolj, Gorj, Mehedinti, Olt, Valcea
		Vest	Arad, Caras-Severin, Hunedoara, Timis
		Nord-Vest	Bihor, Bistrita-Nasaud, Cluj, Maramures, Satu Mare, Salaj
		Centru	Alba, Brasov, Covasna, Harghita, Mures, Sibiu
		Bucureşti	Bucuresti (capital), Ilfov
Slovak Republic	Slovak Republic	Bratislavský kraj	Bratislavský kraj
		Západné Slovensko	Trnavský kraj, Trenciansky kraj, Nitrianský kraj
		Stredné Slovensko	Zilinský kraj, Banskobystrický kraj
		Východné Slovensko	Presovský kraj, Kosický kraj
Slovenia	Slovenia	Slovenia	Pomurska, Podravska, Koroska, Savinjska, Zasavska, Spodnjeposavska, Gorenjska, Notranjsko-kraska, Goriska, Obalno-kraska, Jugovzhodna Slovenija, Osrednjeslovenska
N= 10	N= 18	N= 53	N= 190

Figure 26. Annual per capita GDP income in PPS growth
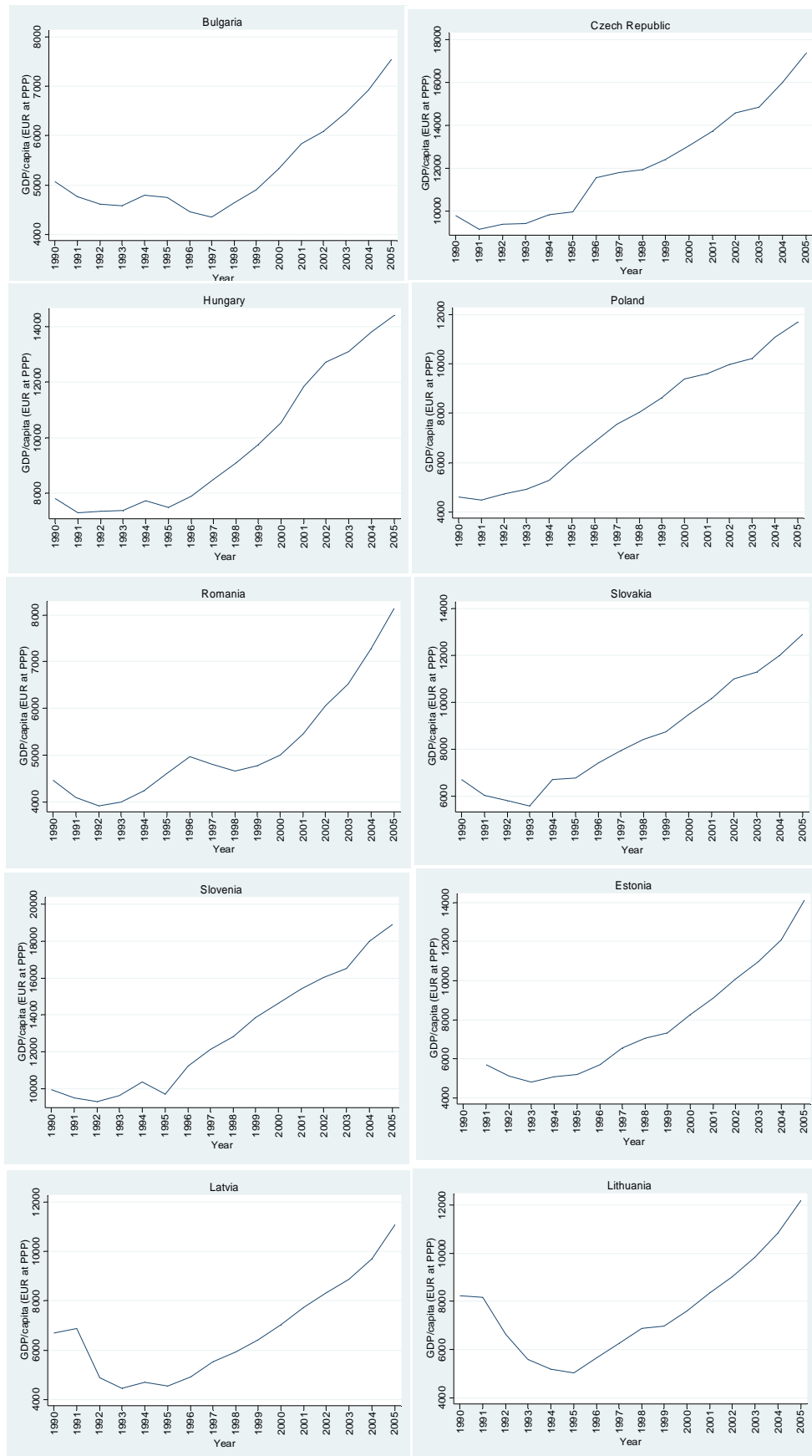
Figure 27. Within country income variation at NUTS-3 level
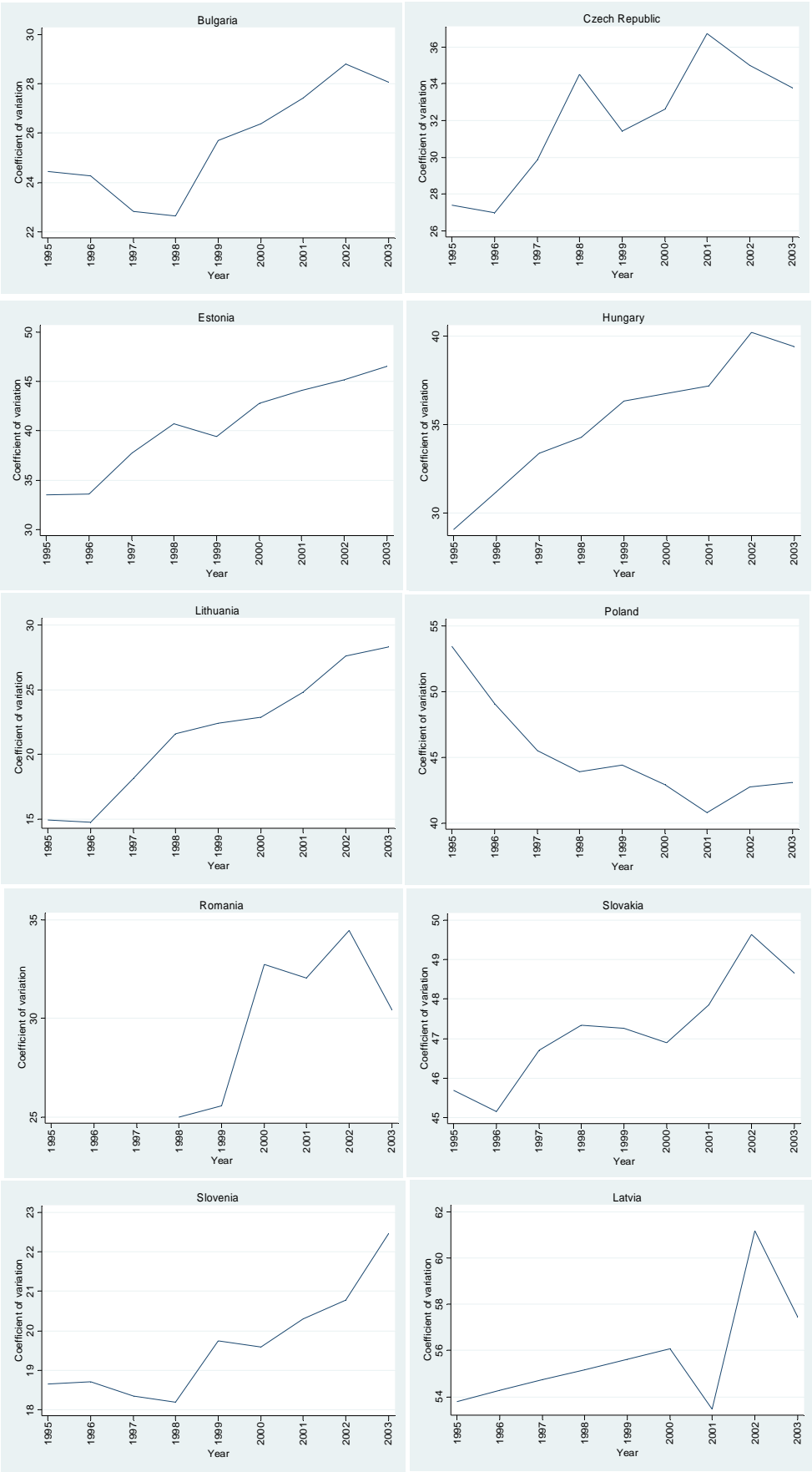
Figure 28. Variable transformations, per capita GDP income

Period 1995-2004

Per capita GDP income year 1995 in PPS, EURO

Histograms by transformation

Period 1998-2004

Per capita GDP income year 1998 in PPS, EURO

Histograms by transformation

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Period 2001-2004

Per capita GDP income year 1998 in PPS, EURO

Histograms by transformation

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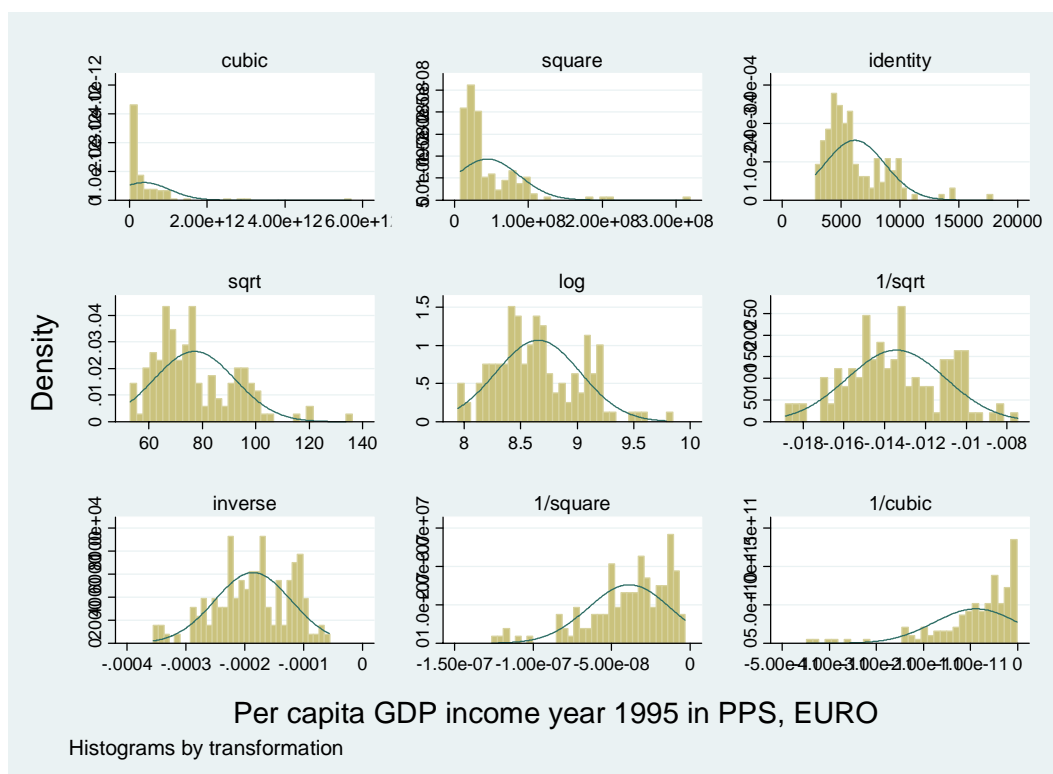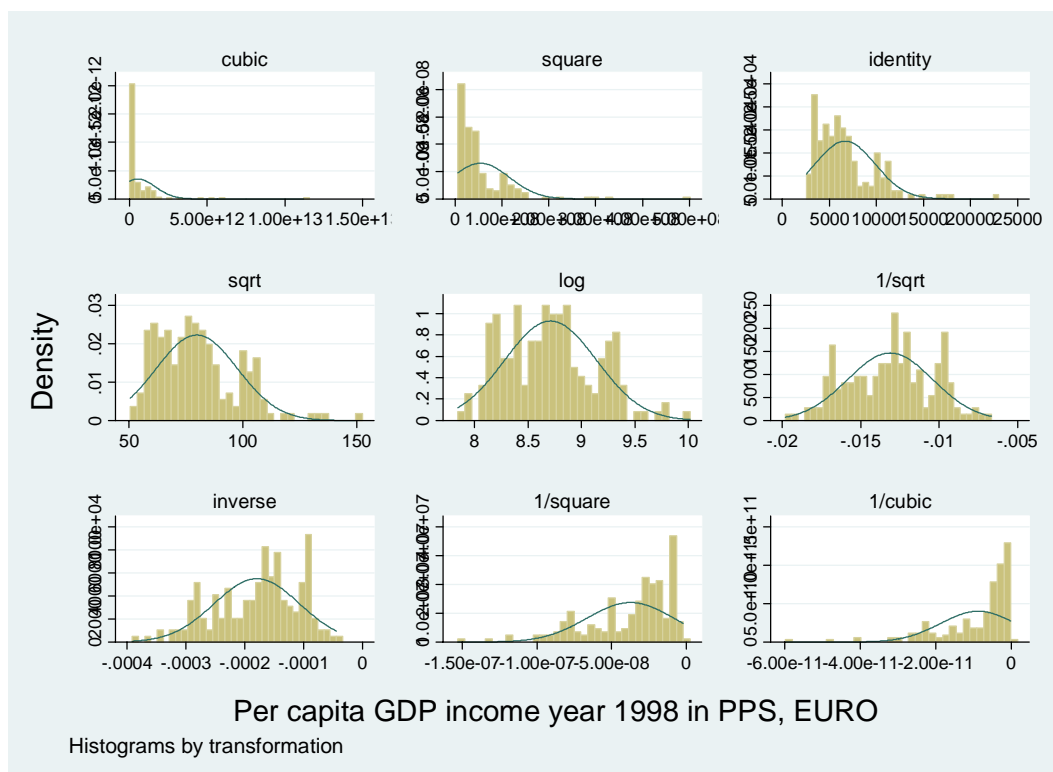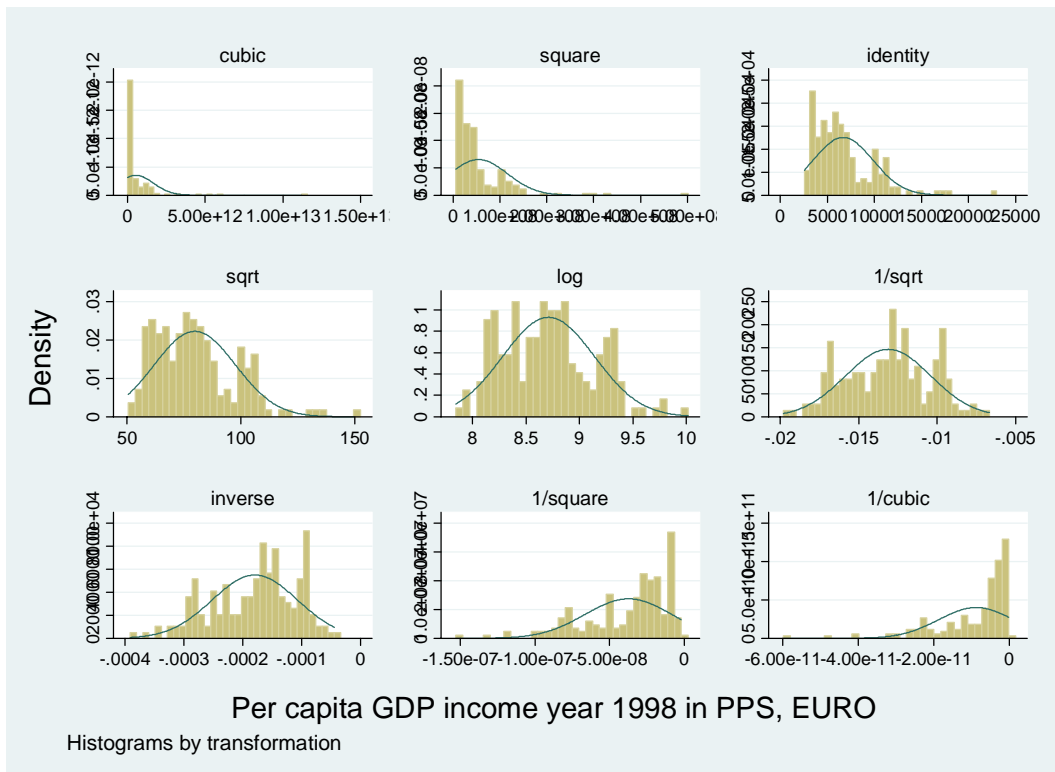
```
+---------------------------------------------------------------+
|                 Table 37. Outliers for NUTS3 level OLS models  |
+---------------------------------------------------------------+
                        Period 1995-2004
      +----------------------------------------------+
      |              name        country         r   |
      |----------------------------------------------|
   1. |            Sliven        Bulgaria   -2.35247  |
   2. |           Dobrich        Bulgaria   -2.057382 |
   3. |      Stara Zagora        Bulgaria   -2.055765 |
 138. |              Pest         Hungary    2.06932  |
 139. |  Komárom-Esztergom        Hungary    2.413601 |
 140. |          Vilniaus       Lithuania    2.878603 |
 141. |        Pohja-Eesti         Estonia    2.921278 |
 142. |              Riga          Latvia    3.015906 |
      |----------------------------------------------|

                        Period 1998-2004
      +----------------------------------------------+
      |              name        country         r   |
      |----------------------------------------------|
   1. |     Bialskopodlaski         Poland   -2.825188 |
   2. | Krosniensko-przemyski       Poland   -2.631832 |
   3. |            Yambol        Bulgaria   -2.437056 |
   4. |           Dobrich        Bulgaria   -2.146391 |
   5. |  Chelmsko-zamojski          Poland   -2.049751 |
 175. |     Caras-Severin          Romania    1.981533 |
 176. |         Hunedoara          Romania    2.010083 |
 177. |          Vilniaus       Lithuania    2.126795 |
 178. |         Bucuresti          Romania    2.24789  |
 179. |        Pohja-Eesti         Estonia    2.318587 |
 180. |              Riga          Latvia    2.364567 |
 181. |    Sofia (stolitsa)      Bulgaria    2.494716 |
 182. |             Timis          Romania    2.674064 |
 183. |           Suceava          Romania    2.71093  |
 184. |  Komárom-Esztergom        Hungary    3.22037  |
      |----------------------------------------------|

                        Period 2001-2004
      +----------------------------------------------+
      |              name        country         r   |
      |----------------------------------------------|
   1. |           Latgale          Latvia   -2.48989  |
   2. |            Pleven        Bulgaria   -2.314855 |
   3. |            Vratsa        Bulgaria   -2.265053 |
   4. |          Silistra        Bulgaria   -2.17079  |
   5. | Ostrolecko-siedlecki        Poland   -2.058527 |
   6. |     Bialskopodlaski         Poland   -2.058255 |
 183. |              Arad          Romania    1.990305 |
 184. |          Ialomita          Romania    2.002734 |
 185. |  Komárom-Esztergom        Hungary    2.055515 |
 186. |             Timis          Romania    2.172147 |
 187. |           Covasna          Romania    2.193862 |
 188. |            Braila          Romania    2.213944 |
 189. |             Mures          Romania    2.33938  |
 190. |             Arges          Romania    2.470064 |
      |----------------------------------------------|
```

Table 38. Observations with high leverage for NUTS3 level OLS models

```
                        Period 1995-2004
      +------------------------------------------------------+
      |  YGDP95                  name     Country   lev9504  |
      |------------------------------------------------------|
 10.  | 17866.4     Hlavní mesto Praha   Czech Rep.  .072614 |
 21.  |  2938.6               Latgale        Latvia   .02983 |
 24.  |  2934.4               Vidzeme        Latvia  .029928 |
 25.  |  2813.9               Zemgale        Latvia  .032878 |
 36.  | 13490.7              Budapest       Hungary  .044184 |
110.  | 11252.4          Obalno-kraska     Slovenia  .030089 |
120.  | 14236.8       Osrednjeslovenska    Slovenia   .04901 |
130.  | 14576.2       Bratislavský kraj    Slovakia  .051215 |
147.  |    2865               Smolyan      Bulgaria   .03159 |
      +------------------------------------------------------+


                        Period 1998-2004
      +------------------------------------------------------+
      |  YGDP98                  name     Country   lev9804  |
      |------------------------------------------------------|
 10.  | 22389.5     Hlavní mesto Praha   Czech Rep.  .055889 |
 36.  | 16806.3              Budapest       Hungary  .036135 |
 83.  | 14963.6          Miasto Poznan       Poland  .029525 |
110.  | 13740.1          Obalno-kraska     Slovenia   .02518 |
112.  | 17401.6       Osrednjeslovenska    Slovenia  .038272 |
113.  | 18154.9       Bratislavský kraj    Slovakia   .04097 |
178.  |  2766.1        Bistrita-Nasaud      Romania  .023812 |
182.  |    2558                 Salaj       Romania  .027646 |
      +------------------------------------------------------+


                        Period 2001-2004
      +------------------------------------------------------+
      |  YGDP01                  name     Country   lev0104  |
      |------------------------------------------------------|
 10.  | 28064.1     Hlavní mesto Praha   Czech Rep.  .052662 |
 36.  |   23606              Budapest       Hungary  .041337 |
 63.  | 27100.3       Miasto Warszawa        Poland   .05025 |
 83.  | 18640.5          Miasto Poznan       Poland  .028369 |
112.  | 21407.4       Osrednjeslovenska    Slovenia   .03562 |
113.  | 22097.3       Bratislavský kraj    Slovakia  .037421 |
178.  |    2942        Bistrita-Nasaud      Romania  .026141 |
182.  |  2849.3                 Salaj       Romania  .027653 |
      +------------------------------------------------------+
```

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+------------------------------------------------------------------------+
|       Table 39. Overall influence estimates using Cook's for NUTS3 level OLS models       |
+------------------------------------------------------------------------+


                              Period 1995-2004
     +-------------------------------------------------------------------+
     | Growth rate  Per capita GDP         County     Country   Cook's D |
     |-------------------------------------------------------------------|
  5. |     2.91          9787.6        Karlovarský  Czech Rep.   .003562 |
  6. |     3.30          9930.5            Ústecký   Czech Rep.  .002954 |
 15. |    15.95          7217.1        Pohja-Eesti     Estonia  .0041257 |
 22. |    16.26          6824.8               Riga      Latvia  .0038776 |
 24. |     9.86          2934.4            Vidzeme      Latvia  .0028267 |
 35. |    15.62          6148.9           Vilniaus   Lithuania  .0030045 |
 36. |    10.93         13490.7           Budapest     Hungary  .0038518 |
136. |     1.54            4376             Sliven     Bulgaria  .0029775 |
     +-------------------------------------------------------------------+


                              Period 1998-2004
     +-------------------------------------------------------------------+
     | Growth rate  Per capita GDP          County    Country   Cook's D |
     |-------------------------------------------------------------------|
  1. |     7.27         22389.5  Hlavní mesto Praha  Czech Rep.  .0034242 |
 15. |    11.55         10355.4        Pohja-Eesti     Estonia  .0037227 |
 22. |    11.76            9829               Riga      Latvia  .0034326 |
 36. |     9.71         16806.3           Budapest     Hungary  .0066059 |
 39. |    14.82          7576.1  Komárom-Esztergom     Hungary  .0035505 |
113. |     7.59         18154.9  Bratislavský kraj    Slovakia  .0026199 |
137. |     1.56          4405.6             Yambol    Bulgaria  .0025205 |
148. |    11.00          2906.9          Kardzhali    Bulgaria   .002385 |
153. |    14.61          3138.7            Suceava     Romania  .0067445 |
174. |    12.13          3596.5      Caras-Severin     Romania  .0026688 |
175. |    12.13          3808.7          Hunedoara     Romania   .002405 |
176. |    13.69          5173.2              Timis     Romania   .002212 |
     +-------------------------------------------------------------------+


                              Period 2001-2004
     +-------------------------------------------------------------------+
     | Growth rate  Per capita GDP          County    Country   Cook's D |
     |-------------------------------------------------------------------|
  1. |     5.10         28064.1  Hlavní mesto Praha  Czech Rep.  .0031102 |
150. |     9.37         13621.1        Pohja-Eesti     Estonia  .0028907 |
210. |      .48          4455.8            Latgale      Latvia  .0035033 |
220. |     9.31         13059.2               Riga      Latvia  .0024816 |
113. |     6.45         22097.3  Bratislavský kraj    Slovakia  .0034969 |
124. |      .73          4765.6             Pleven    Bulgaria  .0026106 |
130. |     1.19          4495.2           Silistra    Bulgaria  .0026136 |
155. |    13.40          4738.2             Braila     Romania  .0024191 |
161. |    14.18            4894              Arges     Romania  .0028023 |
165. |    12.96          4337.9           Ialomita     Romania  .0024074 |
187. |    14.47          3861.1              Mures     Romania   .004212 |
     +-------------------------------------------------------------------+
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