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THE ANALYSIS OF SELECTED SOCIO-ECONOMIC ASPECTS OF REGIONAL DEVELOPMENT IN THE EU

2011   **Dušan Klobušický, Bc.**

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(Diploma thesis)

Study program:	Business economics
Study specialization:	6284800 - Economics and management of entreprise
Department:	Department of economy
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DECLARATION OF ORIGINALITY

I, the undersigned, solemnly declare that this Diploma thesis is a result of my own independent research and was written solely by me using the literature and resources listed in bibliography.

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ACKNOWLEDGEMENTS

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Abstract

V4 group are dynamically developing post-communistic countries that had to undergo a difficult structural transformation. Sales crisis and the end of armament production had caused significant unemployment rate growth that has been decreasing recently. Due to its economic, tax and social reforms in last years, the country has also gained acknowledgement abroad. Comparing to EU member states, Slovakia has high unemployment rate and low GDP level per one inhabitant, however, the country is stabilizing macroeconomic environment through important reforms.

The purpose of this work is to analyze socio-economic aspects of the V4 and EU27 countries through statistical data and information and thus to provide information about the region to both public and experts. Based on the analysis and comparison of selected indicators (GDP, GINI, unemployment), the work shall also identify the importance of particular macroeconomic aspects and their reference to convergence of the region. Before the elaboration of the work, we have studied the relevant issue within the works of both domestic and foreign authors dealing with the matters of economic growth theories, development economy and literature about convergence and divergence of regions.

Within the work, we have compared and tried to state the economic position of the each country from V4 group. As a part of a descriptive characteristic, we have included present situation of V4 in context of selected socio-economic aspects (GDP, GINI, unemployment) and then we tried to find out their significance and effect to convergence. Selected aspects were monitored 10 (GDP, unemployment) resp. 5 years in case of GINI index and then we compare their development during the reporting period. As a last one, for analysis we have opted the exact method of beta convergence in case of GDP as well as sigma convergence in case of unemployment GINI and GDP.

Key words:

socio-economic aspects, beta and sigma convergence, gross domestic product per capita, unemployment rate, GINI

Abstrakt

V4 krajiny sú dynamicky sa rozvíjajúcimi postkomunistickými krajinami, ktoré museli prechádzať zložitou ekonomickou transformáciou a štrukturálnou transformáciou. Odbytová kríza a koniec zbrojnej výroby spôsobili v krajinách V4 výrazný rast nezamestnanosti, ktorá v ďalšom období pozvoľna klesá. V ostatných rokoch si získava v zahraničí uznanie za radikálne ekonomické, daňové a sociálne reformy. V porovnaní s členskými krajinami EÚ má Slovensko vysokú nezamestnanosť a dosahuje nízku úroveň HDP na obyvateľa, no prostredníctvom dôležitých reforiem si stabilizuje makroekonomické prostredie. Cieľom práce je analyzovať vybrané socio-ekonomické aspekty rozvoja V4 a EU27 ako celku pomocou štatistických údajov a informácií a poskytnúť tak verejnosti ako aj odborníkom informácie o danom regióne. Na základe analýzy a komparácie vybraných ukazovateľov identifikovať významnosť jednotlivých makroekonomických aspektov a ich vzťah ku konvergencii vybraného regiónu. Pred vypracovaním diplomovej práce sme preštudovali danú problematiku vo viacerých prácach domácich ale aj zahraničných autorov, ktorí sa zaoberajú témou ekonomického rastu a taktiež regionálnou politikou. V práci sme sa pokúsili vyjadriť ekonomické postavenie jednotlivých krajín V4, ktoré sme navzájom porovnávali. Do deskriptívnej charakteristiky sme zahrnuli všeobecnú charakteristiku krajín V4 v kontexte vybranými ukazovateľmi. Ďalej sme sa zamerali na ekonomickú charakteristiku V4 a to konkrétne na vývoj niektorých socio-ekonomických ukazovateľov ako HDP na obyvateľa, mieru nezamestnanosti a GINI koeficientu.. Jednotlivé ukazovatele sme sledovali v období 10 resp. 5 rokov v prípade GINI indexu a následne porovnali ich vývoj za sledované obdobie v rámci krajín a niektorých krajín EÚ. Pre dôkladnú analýzu sme si zvolili exaktnú metódu beta konvergencie v rámci krajín EU27 a V4 za ukazovateľ HDP a taktiež aj sigma konvergenciu za ukazovateľ mieri nezamestnanosti , GINI indexu a HDP.

Kľúčové slová:

socio-ekonomické ukazovatele, beta a sigma konvergencia, hrubý domáci produkt na obyvatela, miera nezamestnanosti, GINI

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List of Abbreviations and Symbols

V4	Slovakia (SK), the Czech Republic (CZ), Hungary (HU), Poland (PL)
EU27	Belgium (BE), Bulgaria (BG), the Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), France (FR), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), the Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI), Sweden (SE) and the United Kingdom (UK).
EU17	Belgium, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Luxembourg, Malta, the Netherlands, Austria, Portugal, Slovenia, Slovakia and Finland.
NGT	Neoclassical growth theory
EGT	Endogenous growth theory
SRP	Scientific research programmes
R&D	Research and development
TFP	Total factor productivity
NEG	New Economic Geography

Introduction

Economic development is considered to be very important issue nowadays. Many politicians in many countries seek for the best ways how to sustainably increase GDP and decrease unemployment. Some of them are successful some of them are not. In recent years countries from Central and Eastern Europe have made significant progress. After the transition from central planning to market economy, these countries faced many problems during the 90´s. But in the new millennium they become ones of the fastest growing economies in the world. As they are part of the European Union and other transatlantic structures, it can be said that they are in stable environment.

Crucial role in Central Europe region play V4 group. It is an alliance of four Central European states – the Czech Republic, Hungary, Poland and Slovakia – for the purposes of cooperation and furthering their European integration. The Group originated in a summit meeting of the heads of state or government of Czechoslovakia, Hungary and Poland held in the Hungarian castle town of Visegrád on February 15, 1991. The Czech Republic and Slovakia became members after the dissolution of Czechoslovakia in 1993. All four members of the Visegrád Group became part of the European Union on May 1, 2004.They can be considered as one regional cluster with many similarities. These countries are quite interconnected, through huge amounts of exports and imports, there are also cultural, political, economical and social connections among these states. After Slovenia, the Visegrád Group are the wealthiest post-Communist countries in Europe, but they still significantly fall behind the Western economies. All of them have relatively developed free market economies and have enjoyed more or less steady economic growth since the revolutions of 1989. In 2009, Slovakia has adopted the euro as official currency. According to GDP per capita (both nominal and PPP), the most developed country is Czech Republic, followed by Slovakia, Hungary and Poland. Also, Czech Republic, Slovakia and Hungary are considered high-income economies. While Poland is not a high-income economy yet and its GDP per capita is the lowest one of all the four members of the group, it is the biggest economy of them all and the seventh (or, in some ranks, sixth) one in the EU.

The objective of this thesis has been to analyze selected socio-economic aspects of regional development in EU and V4 countries from selected aspects like GDP/capita, unemployment rate and GINI coefficient. These indicators were chosen in order to create a clear view on the aspects of economic prosperity of the analyzed countries,

prospects of growth and convergence in the EU economic context, as well as the level of inequality (if present) due to reforms undertaken by them in their path toward European Union. Further, beta and sigma - convergence has been tested in case of GDP for the countries analyzed and sigma convergence in case of unemployment and GINI index.

1 Theoretical Background

1.1 A Theoretical Framework of Economic Growth theories

Regional development is determined by a region's capacity to exploit and organize local resources (environmental, economic, physical and human) and to attract new resources and activities into the region. The factors that generate this capacity and determines the region's development path and well-being is often built-in to a single indicator – the growth of a region's per capita output or income. This allows for an analytical modeling of the development path and is often made through regional growth theories. The most accepted definition of growth by present-day theories and models of regional growth state that growth is an increase in a region's real production capacity and its ability to maintain that increase **(Capello, 2007)**. The most commonly used measures of regional growth are growth of output, growth of output per worker and growth of output per capita. The most appropriate measure to use depends on the purpose for which the measure is to be used **(Armstrong & Taylor, 2000)**.

Even though there is no single framework that captures the underlying foundations and reasons of economic growth the exogenous and endogenous models presented below are the most common ones **(Howitt & Weil, 2008)**. Policy makers are interested in knowing which factors are the most important determinants of regional per capita income levels and how low-income regions can best be helped to catch up to high-income regions, hence the question is how to generate a process of convergence **(Armstrong & Taylor, 2000)**. Since the primary goal of the EU's Cohesion policy is convergence of regional income per capita the meanings and outcomes of the underlying economic growth- and convergence theories are of high importance **(Ederveen et al., 2003)**.

Any explanation of growth differences needs theoretical underpinning. Economic analyses of differences in growth across countries or regions have mostly been based on one of two perspectives. The first, based on the traditional neoclassical theory of economic growth **(Solow, 1956),** relies on the assumption that technology is a public good, available to anyone free of charge. This perspective puts the emphasis on capital accumulation as the main vehicle for reducing differences in productivity across countries or regions. Moreover, this is assumed to happen more or less automatically, as long as markets are allowed to work freely. The other, competing, perspective puts the

main emphasis on innovation and diffusion of technology as the driving force behind differences in growth (**Nelson and Phelps, 1966; Fagerberg, 1987; Barro and Sala-i-Martin, 1995**). This perspective is based on a totally different view of technology, emphasizing its public as well as private character, and the complementarities with other factors affecting the growth process. This leads to the hypothesis that, without the ability to develop such complementary factors, countries or regions are likely to fall behind rather than catch up.

In recent years, economists have made a lot of progress in studying economic growth and development, using dynamics methods from genetics and ecology perspectives to study ecomocic growth (**Croix and Michel, 2002**), non-linear theory of economic growth (**Fiaschi and Lavezzi, 2007**), the invariance in growth theory theory and sustainable development (**Martinet and Rotillon, 2007**) evolutionary process theory involving geographical clusters of firms and innovation (**Pouder and John, 2003**), macroeconomic theory with respect to output dynamics and structural evolution (**Ulrich and Thomas, 2008**). However, a theory that integrates dynamics with ecology has not been suggested as a possible explanation for economic growth. The present paper argues that ARC theory as applied to economics deserves to be looked as a theory that provides a 'special way' of studying economic development. The authors have done some basic research on ARC, including the development of the discrete ARC model which was used to analyse market countermeasures with respect to new product development by firms (**Dai *et al.*, 2007**), economic development and control strategies under the environmental pressures (**Dai *et al.*, 2008**), and balance conditions and control strategies for economic growth (**Dai *et al.*, 2009**)

1.1.1 Neoclassical (exogenous) Growth Theory

The neoclassical growth theory, developed by Solow and Swan in 1956 is one of the most important growth models which is based on the process of capital accumulation. It assumes that the economy is competitive, in the sense that factors are paid according to their marginal products, and also that factors are quickly able to be reallocated so that they are employed in their most productive use. The theory is based on the law of diminishing productivity which implies that holding one factor constant, i.e. capital the greater the level of the variable factor i.e. labor , the lower its marginal product. The theory consists of three elements: the production function expressed in per capita terms, the link between savings and growth in capital and the required

investments to keep the capital-labor ratio constant given the depreciation rate and the rate of population increase **(Dornbusch, Fischer & Startz, 2008).**

1.1.2   Endogenous Growth Theory

The endogenous growth theory was developed in the late 1980s since dissatisfaction with the neoclassical growth theory had arisen on both theoretical and empirical grounds **(Dornbusch et al., 2008)**. It can be understood as an extension to the neoclassical growth theory since it argues that the technological process is itself determined by the growth process **(Ederveen, et al., 2003)**. While the neoclassical theory leaves out the identification of the causes of technological progress the endogenous growth theory focus on the determinants of the technological progress that enhance the long-run growth (Dornbusch et al., 2008). This is done by broadening the concept of capital to include the accumulation of human capital **(Mankiw, Romer & Weil, 1992)**. The endogenous growth theory was developed by **Romer (1986)** and **Lucas (1988)** where growth is endogenously generated by a process of knowledge accumulation. The basic idea of the theory is to modify the production function in a way that allows for self-sustaining (endogenous) growth so that the function obtains constant marginal product of capital. This implies that both the savings and the production curve become straight lines and savings will always be higher than required investments **(Dornbusch et al., 2008)**. The implication of the endogenous growth model is that countries or regions that save more will have a higher growth rate and the differences in income between them can persist indefinitely even though they have the same saving and population growth rates **(Mankiw et al., 1992)**. In the endogenous growth theory the engine of growth is the technological progress therefore differences in long-term economic growth can be explained by differences in the efforts to generate or adapt knowledge on new technologies **(Ederveen, et. al, 2003)**.

The extended version of the neoclassical model emphasizes the importance of human capital as a critical factor in determining the productive capacity of the economy. Furthermore it points out that a region's ability to create or absorb technical progress is not simply a matter of investing in physical or human capital but is also determined by its institutional environment. Knowledge-rich regions will be generated in an institutional environment that promotes the creation and transmission of new ideas. These regions will increase their technical knowledge which will be transformed into new products and new methods of production. As a result regional disparities exist due to institutional environmental differences. In this sense some regions are more able

to generate their own technical change, hence some regions are able produce (endogenous) technical progress within the region while others acquire their (exogenous) technical progress through the purchase of new capital equipment from other regions.

1.1.3 New Economic Geography

The new economic geography literature emphasizes the role of clustering forces in generating disparities of economic activity and income between regions. One of the primary questions that the new economic geography seeks to answer is why economic activity is distributed unevenly, with centers of concentrated activity surrounded by 'peripheral' regions of lower density. It provides an approach to the theory of economic agglomeration and has been applied to the economics of cities, the emergence of regional disparities, and the origins of international inequalities **(Venables, 2008)**. Theories of agglomeration suggest that there is an important economic benefit of economic agglomeration (spatial co-location of economic agents) since economic activity and population around the world is concentrated in highly dense metropolitan areas **(Sachs & McCord, 2008)**. Agglomeration theory is primarily a theory of external economies of scale since the profitability of each firm is higher the more other firms there are nearby. This could be because of true externalities such as direct positive links between firms, specifically knowledge spillovers **(Braunerhjelm, Faini, Norman, Raune & Seabright, 2000)**. There are two types of agglomeration economies, localization and urbanization economies **(Ohlin, 1933)**. Urbanization economies are associated with city size or diversity while localization economies are associated with the concentration of particular industries **(Strange, 2008).**

1.1.4 Fitting growth economics into Lakatos's framework

In the small literature devoted to methodological evaluation of economic growth theories, there are some studies that either are concerned with searching for some small-scale SRPs in the modern economics of growth or try to fit growth research in a large-scale neoclassical SRP. **Pomini (2003)** undertook the most complete attempt of reconstructing the hard core and heuristics of growth theories. He argues that NGT and EGT are situated in the same neoclassical SRP, but that they form different sub-programmes with their own demi cores in the sense of **Remenyi (1979)**. In Pomini's account, demi-core of EGT extends NGT's demi-core by adding a proposition that growth is determined by the accumulation of immaterial capital (human capital, ideas,

etc.). The trouble with finding a common hard core in growth theorizing is stressed also by **Maurseth (2001),** who reasoned that NGT and EGT belong to the neoclassical SRP, but with a fairly 'soft' hard core. This forced him to abandon the SRP concept in the exercise of comparing neoclassical and evolutionary tradition in growth research. The studies by **Blaug (2002)**, **Foss (1997)** and **Guala and Salanti (2003)** also assumed that NGT and EGT are situated in a broadly understood neoclassical SRP.

1.1.5 Clarifying the development and contemporary dynamics of EGT

This section provides a concise and necessarily selective review of major developments in endogenous growth research with special attention given to recently established groupings of various models into 'generations' and more specific units.

Cavusoglu and **Tebaldi (2006)** deal mainly with the so-called first-generation EGT, which is called AK theory. This theory, which includes as its variants famous models of **Romer (1986)** and **Lucas (1988)**, aimed at explaining technological progress as a form of capital accumulation. In such models, capital was broadly understood to include physical and human capital, while capital accumulation as its by-product generated knowledge accumulation. These assumptions allowed theorists to show that non-diminishing returns to capital are possible and that an economic policy of increasing savings rates will lead to a higher long-run growth rate. AK theory was followed and largely replaced by second-generation EGT – the innovation- or R&D-based approach. There are two branches of second-generation EGT: (1) 'product variety' models, initiated by **Romer (1990)**; and (2) 'Schumpeterian' growth theory, which originated in early 1990s with the publication of several contributions **(Aghion and Howitt 1992)**. According to the first approach, research leads to the expansion of a variety of new, but not necessarily better quality intermediate (resp. final) products, which increases an economy's production potential (resp. utilities of variety-loving consumers). On the other hand, Schumpeterian growth theory focuses on quality-improving innovations that create improved versions of old products in a process that resembles Schumpeter's creative destruction. Innovation-based EGT implies that the proper policy to foster growth is not to save an increased fraction of output, as suggested by first-generation EGT, but rather to devote large part of outcome to subsidising R&D **(Howitt, 2008)**. In particular, Schumpeterian variant of this approach is able to deliver an impressive

number of more specific recommendations about growth-maximizing, context-specific policies that concern competition and entry policies, the allocation of education funding or macroeconomic policies **(Aghion and Howitt 2006; Aghion 2008).** Yet another advancement in the second-generation EGT concerns a prediction of this theory that more populous countries should grow faster because of the so-called 'scale effects' **(Jones, 2005)**. According to this concept, an increased population contributes to growth through two channels: (1) it expands the market for the products of successful innovators; and (2) it raises the number of potential R&D workers. For these reasons, more populated countries should have higher levels of R&D expenditures and workers, which should produce a higher rate of innovation and growth. This prediction of the first generation of innovation-based growth theories was falsified by **Jones (1995)**, who argued that it was inconsistent with empirical evidence for the US and other countries. In response to this 'Jones critique', a second-generation of R&D-based theory (itself a second-generation EGT) was developed, which is consistent with Jones's finding that enormous increases in R&D workers coexisted with no trend in total factor productivity (TFP) This scale-invariant or 'growth without scale effects' theory comes in two versions: (1) 'semi-endogenous' theory of **Jones (1995)** and others; and (2) 'fully endogenous' Schumpeterian theory of **Aghion and Howitt (1998)** and others. Semiendogenous growth theory assumes that there are diminishing returns to knowledge in R&D and therefore sustained growth in TFP requires sustained growth in R&D resources. **Jones (1995)** summarizes predictions of this approach in the following way:

- Eliminating the scale effects induces a return to Solow-like implications for long run

  growth . . .

- Long run per capita growth depends only on parameters that are usually taken to be exogenous and is therefore independent of policy changes such as subsidies to R&D . . .

- Specifically, the steady-state growth rate depends on the growth rate on inventions, which inturn depends on the (exogenous) rate of population growth . . .

The other class of second-generation innovation-based EGT – fully endogenous Schumpeterian theory – uses **Young's (1998)** argument, which states that as the size

(scale) of the economy increases, an increased product variety might reduce returns to R&D inputs, since resources devoted to quality improvement have to be 'spread more thinly over a larger number of different sectors' (**Ha and Howitt, 2007**). Modified in this way, Schumpeterian growth theory is consistent with Jones's evidence and explains technological progress (and long-run growth) with reference to the same set of economic forces as the first generation R&D-based theory (e.g. productivity and size of innovations), with the exception of scale effects mechanism (**Aghion and Howitt, 2005**). In opposition to semi endogenous growth theory, this fully endogenous approach has the same policy implications as the first generation of innovation-based theory.

1.2   Convergence and Divergence

The process of economic integration has triggered complex territorial dynamics in Europe. Basically, opposite dynamics appears to prevail for national and regional economies. The convergence process of the national economies of the EU coexists with a process of divergence *between* the regional European economies. The process of economic integration occurs in a context of increased importance of permanent innovation and of resulting increased territorialisation of activities where the metropolitan areas seem to embody the main issues at stake on European scene, particularly regarding its regional dimension. Different theoretical literatures have been developed, regarding both income convergence and regional specialisation in Europe.

Theories of convergence and divergence are theories which examine the reasons for diminishing or increasing disparities between rich and poor regions, and theories which, in the case of divergence explain the persistence of such disparities. Economic growth theories are often associated with processes of convergence or divergence (**Capello, 2007**). The connection between the different growth theories presented above and the process of convergence/divergence will be presented below.

Two types of convergence are identified, firstly absolute convergence which implies that poorer countries or regions tend to grow faster per capita than rich ones and conditional convergence which implies that an economy grows faster the further it is from its steady state value, regardless if it is poor or rich (**Barro & Sala-i-Martin, 2003**).

The endogenous growth model is not designed to explain why different economies grow at different rates. The model cannot predict convergence between countries or regions since a region's production function allows for self-sustaining endogenous growth (**Mankiw et al., 1992**). The model can on the other hand explain the sources of divergence. Since the model assumes that technology makes technology a poor economy will stay poor because it lacks the ability to invent and adapt new technologies while rich countries at the technological forefront find it easier to invent and adapt new technologies, thus increasing their lead (**Ederveen et al., 2003**).

In the new economic geography approach a concentration of economic activity facilitates the transmission of knowledge and innovations. This implies that economic centers grow faster than other types of regions and the disparities between them can increase (**Gullstrand & Hammarlund, 2007**).

It is by now well established that the distribution of regional incomes per capita in Europe became more equal after the Second World War (**Molle, 1980; Molle and Cappellin, 1988**). However, this convergence in regional. Incomes seems to have slowed or come to halt after 1980 (**Fagerberg and Verspagen, 1996; Cappelen *et al.*, 1999**). This is especially the case for the countries that were already members in the 1970s. But, during the 1980s, three relatively poor southern European countries joined the Union and, as might be expected, this led to changes in the European growth pattern (including convergence). More recently the EU has been enlarged by three relatively rich countries (Austria, Finland and Sweden) as well as a relatively poor one (Eastern Germany), and this may also have affected European growth and the regional distribution of income in the EU.

This shows that, when studying dispersion of regional incomes in the EU over time, it is important to adjust for significant changes in the number of regions within the EU.

Since the seminal cross-country studies of Baumol (1986), Abramovitz (1986), Barro (1991), and Mankiw, Romer, and Weil (1992), the convergence/divergence issue has been extensively debated for regional levels that are assumed to consist of more homogenous economies (see Magrini 2004, for a review). Barro and Sala-i-Martin (1992, 1995) and Sala-i-Martin (1996) found that there is evidence of unconditional b-convergence within the 48 states of the United States, 10 Canadian provinces, 47 Japanese prefectures, and 90 regions of eight European countries. The estimated speeds of convergence are surprisingly similar across data sets and are found to be in the

neighbourhood of 2 percent per year. Following Barro and Sala-i-Martin, Coulombe and Lee (1995) found unconditional b-convergence for provinces in Canada (2.5 percent), Cashin (1995) for the seven states of Australia (1.2 percent), Hofer and Wörgötter (1997) for both nine regions and 84 districts in Austria, Persson (1997) for 24 Swedish counties (4 percent), and Kangasharju (1998) for 88 Finnish subregions (2 percent). On the other hand, some other studies do not support the unconditional b-convergence hypothesis such as Mauro and Podrecca (1994) for Italian regions, Siriopoulos and Asteriou (1998) for the case of 13 Greek regions, and Gripaios, Bishop, and Keast (2000) for the counties of the UK. For the EU regions as a whole, Button and Pentecost (1995), for 51 NUTS I regions in the period 1975–1988, suggest that there have been periods when convergence has been strong (at the end of the 1970s) and periods when convergence has been insignificant (the early 1980s) while Neven and Gouyette (1995) reported that since 1975 there was a slow process of convergence among 107 EU regions which stagnated in the 1980s. Moreover, Armstrong (1995) found an annual b–convergence rate of 1 percent for 83 NUTS I regions in 12 countries for the period 1960–1990; Fagerberg and Verspagen (1996) investigated 70 regions in six European countries for the time period 1957–1990, finding evidence of weak convergence; while Paci (1997) indicated that there was b-convergence only in labour productivity for the time period 1980–1990 over 109 regions. Finally, weak evidence of convergence was also reported by Martin (2001) for 195 regions in the period 1975–1998 and by Rodriguez-Pose and Fratesi (2004) for the period 1988–1999. However, the latter study found evidence of convergence among the regions of Cohesion countries with a speed of 3 percent per year. Overall, a widely shared result is that since the two oil crises of the 1970s, convergence has stagnated and in some cases, divergence growth patterns have been observed. Although the examination of the b-convergence hypothesis remains a very popular issue, it also suffers from a number of weaknesses. From an econometric point of view, a number of serious problems (especially for conditional models) have been identified by the literature. These include parameter heterogeneity, omitted variables, model uncertainty, outliers, error correlation and regional spillovers, endogeneity, and measurement errors. Panel data techniques might overcome some of these problems, such as parameter heterogeneity and omitted variables, but they are still in their infancy (Durlauf, Johnson, and Temple 2005; Temple 1999). Other alternative techniques include time series and probability transition matrices (see Islam 2003 for a

review). Furthermore, s-convergence has also been criticized because it provides no information on the intra-distribution dynamics (Magrini 2004; Quah 1996).

From an economic point of view, there are some disadvantages related, among others, to cyclical effects, the limited usefulness of conditional convergence tests and the NUTS classification. The standard model of b-convergence is unable to capture potential short-run effects of business cycles on growth **(Petrakos, Rodriguez-Pose, and Rovolis 2005)**. However, capturing business cycles is necessary because their timing varies across regions; therefore, convergence or divergence trends heavily depend on the choice of time intervals. The use of b-conditional models is problematic by its nature, and misleading, as the economic, structural, or demographic variables included in the analysis remove the influence of structural characteristics and find tendencies of convergence among economies that do not exist in reality **(Petrakos, Rodriguez-Pose, and Rovolis 2005)**. Furthermore, many authors such as **Boldrin and Canova (2001)** and **Thisse (2000)**, among others, argue that NUTS classification is inappropriate because of its inability to illustrate regional imbalances regardless of its statistical simplicity. NUTS II (with some exceptions), and especially NUTS III, are small units to include the sum of economic linkages (as few economic activities are spatially integrated in them), so the notion of convergence has no concrete value **(Davies and Hallet 2002)**. This problem, of course, is not only related to b-convergence models, but to all methods of measuring regional inequalities.

1.2.1 Theoretical considerations of income convergence

The concept of convergence in the most general sense is the decreasing or equalising of disparities. For economists the convergence of income levels (or total factor productivity levels) between countries or regions has been a very topical subject to investigate. Following **Holocombe (2001)** there are two main concepts of economic growth: a) the concept of production factors; b) the institutional economic growth theory. There are also two main competitive theories – neoclassical growth theory **(Solow 1956)** and endogenous growth theory **(Romer 1986)** – within the framework of the production factors concept. Neoclassical growth theory predicts the decrease of disparities in income levels (called convergence optimism) because of decreasing returns to reproducible capital, while endogenous growth theory predicts persistent and

even increasing inequality (called convergence pessimism) because of increasing returns to scale. As a result, the two theories have different views on the necessity of government policy. Endogenous growth theory demonstrates that policy measures can have an impact on the long-term growth rate of an economy, while in the neoclassical model only a change in the savings rate could generate long-term growth.

In the traditional neoclassical growth theory regional economic growth depends on three factors: population growth, capital accumulation and technology. There is more capital in the richer regions and therefore there are also lower marginal returns to capital and slower economic growth. Additionally, international trade, migration and capital flows should create the preconditions for reducing the gap in productivity and living standards between countries and between regions. In open economies labour should move to the richer regions because of the higher wage levels, while capital on the other hand moves to the poorer regions thus increasing their economic growth (**Armstrong and Taylor 1999**). Furthermore, it is found that the diffusion of new technology and innovations can lead to convergence even in the case of positive returns to scale. Richer countries (or regions) are usually the innovators, poorer ones only adopt these innovations and the costs of adopting the innovations are generally significantly lower than the costs of actually creating them (**Rey 2004**).

In the endogenous growth theory – in contrast to the neoclassical approach – human capital is taken into account and technological progress is endogenised. When human capital is added to the model there is no longer any reason to assume decreasing returns to capital, and therefore the per capita GDP levels of different regions may not converge with one another even if the preferences, saving rates and technology are similar in these regions.

Unfortunately many convergence studies mainly focus only on the production factors concept as the theoretical framework for income convergence, meaning that the micro level of an economy is often ignored. The implications of institutional economic growth theory should be considered, because, as **North (1990)** pointed out, institutions are the stimulating systems of a society and can therefore both promote and hamper economic growth. Poor regions can only grow and catch up with richer ones if and when they have efficient institutions.

The integration theory, the classical trade theory and New Economic Geography (NEG) support clearly neither convergence optimism nor pessimism. However, there seems to be more support for convergence pessimism in NEG, which (**Krugman 1991;**

Baldwin *et al.* 2003; Martin and Ottaviano 1999) aims to explain the formation of a large variety of economic agglomerations in geographical space. Using the general equilibrium framework, NEG shows that increasing returns at the level of the individual producer or plant, imperfect competition, transport costs, and the locational movement of productive factors and consumers are the prerequisites for agglomeration and the core-periphery pattern to occur. Even regions that are initially perfectly symmetrical might re-organise themselves into a core and a periphery and nothing more than a decrease in the cost of trade between them is necessary for that to happen. NEG also claims that location plays an important role in the economic activity of a region. In addition to other factors, the economic situation of a region depends on its location and its neighbours, so poor regions have greater chances for development if they are surrounded by the rich neighbours **(Le Gallo 2001)**.

NEG has particularly highlighted location and agglomeration externalities, which can arise because of knowledge spillovers, various market effects, and input-output linkages between the firms operating at various spatial levels (e.g. regions, cities, districts of cities, rural areas, etc). Overall, economic theory does not give a unique answer for the direction of the dynamics in income distribution. There are many complex relationships and factors that influence economic growth and the income convergence process, which makes it quite understandable that different theories can lead to different conclusions.

Convergence hypotheses

There are three well-known competitive convergence hypotheses:

• the absolute (unconditional) convergence hypothesis

• the conditional convergence hypothesis

• the club convergence hypothesis.

In the absolute convergence hypothesis, the per capita incomes of countries or regions converge with one another in the long-term regardless of the initial conditions. Poorer countries and regions grow faster than richer ones and there is a negative relationship between average growth rates and initial income levels even if no other variables are included in the regression model as explanatory factors. It is assumed that all economies converge to the same unique and globally stable steady state equilibrium, which is a reasonable assumption in the case of a homogeneous sample of countries or

regions (such as states of the USA, OECDcountries, European regions (as given by **Arbia** *et al* **2005**)).

According to the conditional convergence hypothesis, the percapita incomes of countries or regions converge with one another in the long-term provided that their structural characteristics (eg technologies, human capital, institutions, population growth rates, preferences, infant mortality rates) are identical. The initial conditions, as in the case of absolute convergence, are irrelevant. In the case of conditional convergence, equilibrium differs by economy, and each particular economy approaches its own but unique equilibrium. In other words the evidence should suggest the existence of conditional convergence if the negative relationship between initial per capita incomes and their growth rates holds only after the possibility of the above-mentioned structural characteristics has been controlled for (**Mankiw** *et al* **1995**). Thus conditional convergence can occur even if the absolute convergence hypothesis is not valid.

In the club convergence hypothesis the per capita incomes of countries or regions that are similar in both their structural characteristics and initial factors (eg GDP per capita, human capital, preferences, public infrastructure) converge with one another in the long-term. **Fischer and Stirböck (2004)** define club convergence as the club-specific process by which each region belonging to a club moves from a disequilibrium position to its club-specific steady-state position. At the steady-state the growth rate is the same across the regional economies of a club. **Cappelen (2001)** notes that the possibility of club convergence is ruled out by implication in the standard neoclassical model, because agents are assumed to be homogeneous (which means there are no different initial conditions and therefore no convergence clubs), but if agents are allowed to be heterogeneous the dynamic system of the neoclassical growth model could lead to multiple steady-state equilibria in spite of diminishing returns to capital. **Durlauf (2001)** points out that a key limitation of the majority of empirical analyses of cross-sectional regional growth has been that the assumption of a single steady-state has to hold for all the regional economies in the sample, which is the case in the absolute and conditional convergence hypotheses.

The club convergence hypothesis, on the other hand, allows multiple and only locally stable steady-state equilibriums. **Martin (2001)** explains that if regional economies differ in their basic growth parameters (for example technological innovativeness and human capital development under his definition), or knowledge

spillovers between them are weak, they may not converge to a common per capita income, but instead to different economy-specific equilibrium levels of per capita income. Under such circumstances there might be convergence among similar types of economies (clubs, regimes), but little or no convergence between such clubs **(Martin 2001)**. We share the opinion that the concept of club convergence is in line with the phenomena which characterise modern economies, such as polarisation, clustering and permanent poverty. We also agree with the point **(Islam 2003)** that despite the conceptual distinction, it is not easy to distinguish 'club convergence' from 'conditional convergence' empirically. This is reflected in the problems associated with the choice of criteria to be used to group the countries when testing for club convergence.

The problem of convergence, which is a temporal tendency to lessen some specific differences among countries, is one of the most widely researched in growth econometrics. Yet, since there are multiple definitions of the concept, empirical evidence on convergence is in general indecisive **(Durlauf and Johnson, 2008)**. The key definition relevant for the evaluation of growth theories is that of convergence among countries to the same rate of economic growth (the so-called b-convergence). b-convergence can be further divided into unconditional (absolute) and conditional convergence. The first concept suggests that all differences in per capita incomes among countries are temporary, while the second one favours the view that these differences are permanent solely because of cross-country structural heterogeneity like differences in technology, population growth rates, population's saving rates, etc. **(Durlauf, Johnson, and Temple, 2005)**. There is also another concept of b-convergence – club convergence – related to but distinct from conditional convergence and found in multiple equilibria models. Club convergence implies that different groups (clubs) of countries that share initial conditions or other characteristics converge within groups to their own long-run outcomes, which differ among groups. Thus, there is no global convergence across all countries. As argued in many recent authoritative surveys of the literature **(Johnson, 2008)**, empirical evidence of conditional b-convergence, which is robust with respect to the choice of control variables, has been found in both cross-section and panel data. There is less consensus whether conditional convergence holds when time series analysis is employed. Evidence for unconditional convergence has been found only for developed economies, while there is no support for it in research based on global samples. Empirical research devoted to testing club convergence is the most challenging as it faces many theoretical and empirical difficulties **(Islam, 2003)**.

However, a small number of sophisticated studies seem to confirm the existence of multiple convergence clubs (**Durlauf 2005, Durlauf and Johnson 2008**). The finding of conditional b-convergence has been often interpreted as evidence in favour of NGT, or its augmented version, since it is consistent with a prediction of this theory (**Mankiw, Romer, and Weil 1992**). At the same time, it has been explicitly considered as a result against EGT (Evans 1996, 1998), since the first generation of this theory, due to the assumption of non-diminishing returns to capital, predicts absolute and conditional income divergence. In the light of the fact that conditional b-convergence was observed, NGT seemed corroborated, while EGT – falsified.

However, such conclusion is valid only for first-generation EGT. As argued by **Howitt (2004)**, one of the main reasons for the rise of second-generation EGT was to account for conditional convergence predicted by NGT. Howitt developed a model belonging to the Schumpeterian growth theory, which is able to explain cross-country convergence albeit slightly different from the neoclassical kind. Convergence in the model results not from decreasing returns in capital accumulation, but from knowledge spillovers in the process of technology transfer from more advanced to less advanced countries or sectors. The conclusion of **Howitt (2000)** is that all countries that innovate (perform R&D activities) at a positive level should also implement technologies developed in other countries and converge to the same long-run growth rates, while countries in which conditions are so unfavourable to innovation (because of macroeconomic instability, bad legal environment, poor education system, dysfunctional credit markets, etc.) that firms do not innovate, will not benefit from technology transfer and grow more slowly than the technology leaders, even in the long run. Therefore, Howitt's model is capable of explaining not only conditional b-convergence a` la Solow–Swan model, but also club convergence, in the sense that technologically advanced countries (rich and majority of middle income economies) converge to one group with the same long-run growth rate, whereas all other (mostly poor) countries stagnate.

Howitt's model is just one example of endogenous growth model compatible with b convergence. **Islam (2003)** and **Durlauf et al. (2005)** give further examples of such models. In this situation, it has become recognized that convergence/divergence predictions of growth models cannot serve as a sufficient basis for discrimination between NGT and EGT. **Islam (2003)** forcefully stated such a conclusion in his

comprehensive review of the debate on convergence: 'The convergence implication can no longer be associated solely with the [NGT] . . . [I]t is now possible to explain both convergence and non-convergence behaviour by appropriately chosen models of growth theory of both [neoclassical and endogenous] varieties'. This is an important guideline for our analysis, since it suggests that it may be necessary to go beyond convergence-related predictions, when one is looking for novel facts supplied by EGT.

1.2.2 Beta and sigma convergence

The conditional β-convergence hypothesis assumes that the negative correlation occurs only if some structural characteristics (such as the demographic situation, government policy, human capital, employment rate etc) are identical in the economies under consideration. There exists a negative correlation between the growth rate and the distance that the income level is away from its steady state equilibrium. Therefore poorer regions do not necessarily grow faster than richer regions because the latter ones may be even further away from their steady state equilibria. The usual cross-sectional equation for testing conditional β– convergence is as follows, in matrix form (**Baumont et al 2002**):

(2) $g = \alpha S + \beta y + X\varphi + \varepsilon\ T\ 0\ ,\ N(\ I\ ) \sim 0,\ 2\ \varepsilon\ \varepsilon\ \sigma$, where X is the matrix of explanatory variables constant in the steady state equilibria and all other terms are as previously defined. There exists conditional β–convergence if the estimated value for β is significantly negative. The *sigma*-convergence approach has become popular since the work by Daniel Quah in the beginning of the 1990s. Using the connection with Galton's famous fallacy, **Daniel Quah (1993)** showed that the traditional growth-initial level relationship does not give a clear answer about convergence as the relationship tends to be negative even if the income differences have not decreased. *Sigma*-convergence (σ – convergence) pertains to the decline in the cross-sectional dispersion of per capita incomes over time. As suggested by **Quah (1993)** σ-convergence should be of interest since it answers directly whether or not the distribution of income across economies is becoming more equitable. On the other hand, as also pointed out by **Islam (2003)**, methodologies associated with the investigation of β-convergence also provide information on the structural parameters of growth models, while research taking the distribution approach usually does not provide such information. It should be noticed that *beta*-convergence is a necessary but not sufficient condition for s*igma*-convergence to occur (**Barro and Sala-i-Martin 1991; Salai-i-Martin 1996; Bernard and**

Durlauf, 1996; Quah 1996a; Young *et al* (2004)). A negative β from a growth-initial level regression does not necessarily imply a reduction in variation of regional income or growth rates over time.

Some empirical results of previous income convergence studies

Although theoretical literature has suggested the importance of location and agglomeration externalities as the key determinants of the spatial concentration of economic activity and income **(Krugman, 1991; Fujita et al., 1999)**, the empirical literature has still lagged behind theoretical developments in exploring regional income disparities and convergence. Until the 1990s country level (as opposed to regional level) studies clearly prevailed in the empirical literature on the issue of income convergence.

The results of some earlier studies indicated that the majority of countries and regions have become much richer during the past century, but those that were already richer have gained considerably more **(Durlauf and Quah (1999); Dowrick and DeLong (2001)).** Therefore the gap between rich and poor countries has increased. Exploring income convergence and divergence in various countries of the world during the last 200 years, **Dowrick and DeLong (2001)** distinguished four periods where direction of the process towards income convergence or divergence varies. According to their research results, there has been no convergence of economic development in the second half of the 20th century. Overall inequality between the world's countries has increased, and convergence has occurred only in small groups (clubs) of economies, for example OECD countries after World War II **(Dowrick and Nguyen 1989)**, East Asia after 1960 (see World Bank 1994), and the regions of India in the end of 20th century **(Bajpai and Sachs 1999)**. These examples are in line with the club convergence hypothesis, the idea of which, incidentally, rests on theoretical models that yield multiple regimes. According to the models each region moves towards its club-specific steady-state equilibrium, which depends on the initial position of the region. The steadystate equilibrium is the same for every region in a particular convergence club but differs between different clubs. Studies of regional income convergence have become particularly popular in the past 15 years **(Armstrong 1995; Barro and Sala-i- Martin 1991; Bernat, Andrew 2001; Carlino and Mills 1993, 1996; López-Bazo *et al* 1997; Molle and Broeckhout 1995; Neven and Gouyette 1994; Suarez-Villa and**

Cuadrado-Roura 1993; Rey 2001; Rey and Montouri 1999; Tsionas 2000; Vohra 1998). In one of the pioneering studies on the issue **Barro** and **Sala-i-Martin (1991)** found significant evidence of economic convergence across 48 states in the USA (since 1880) and across 73 European regions (since 1950). There appears to be a general agreement in the majority of later studies that there was regional income convergence in Europe from the 1950s to the 1970s. In the decades since then the convergence process appears to have slowed down and stagnation to have arrived (**Molle and Broeckhout 1995; Armstrong 1995)**. However, the real picture is not so simple. **Neven** and **Gouyette (1994)** have stressed that there are strong differences in the patterns of convergence across sub-periods and across subsets of regions. According to their study, there was divergence (or stagnation) in the first half of the 1980s in Northern Europe and strong convergence afterwards. On the other hand, regions in Southern Europe converged in the beginning of the decade and at best stagnated thereafter. Similar slowdowns in the convergence process after the second half ofthe 1970s have also been found in other countries **(Andrés and Doménech (1995) for OECD countries; Sala-i-Martin (1996) for Japan, USA and five European countries)**. The study of Rey and **Montouri (1999)** was, to the best knowledge of the authors, the first to explicitly consider the role of spatial effects in a regional income convergence study. Analysing convergence patterns across states of the USA they found strong evidence of spatial autocorrelation in both the levels and growth rates of state per capita incomes. The authors deduced that while states may be converging in relative incomes, they do not do so independently but rather tend to display movements similar to those of their regional neighbours. Givin that the high degree of spatial aggregation might mask the existence of different growth trajectories below the state level, **Lim (2003)** assessed regional income convergence for the period 1969–99 using data for 170 economic areas4 in the conterminous States of the USA, as defined by the Bureau of Economic Analysis. His findings reveal strong evidence supporting the presence of spatial dependence in both per capita personal income levels and per capita personal income growth during the sample period. However, taking the spatial dimension of growth into account lowers the estimation of

beta (as an absolute value) but does not alter the general conclusion that per capita personal income growth in the economic areas is characterised by a process of convergence. **Arbia *et. al.* (2005)** used spatial dependence panel data models to analyse the long-term convergence of *per capita* income in 92 Italian provinces in the period

1951–2000, and considered a structural break in the growth of Italian provinces at the beginning of the seventies. The speed of the convergence process was much higher in the first subperiod (1951–1970), and furthermore, the speed of convergence estimated using the spatial lag model was much lower than that arrived at with the classical fixed-effect specification. **Baumont *et. al.* (2002)** showed that spatial dependence and spatial heterogeneity matter when estimating the *beta*-convergence process among 138 European regions over the period 1980–1995. Using spatial econometrics tools, the authors detected both spatial dependence and spatial heterogeneity in the form of structural instability across spatial convergence clubs. By using a spatial error model they found that the convergence process is different across spatial regimes. Slightly fewer regions (125 from 10 countries) but the same time period were used in the study by **Arbia and Piras (2005)** and the findings also indicate significant spatial effects between regions. As we noted when looking at the earlier regional convergence studies, the empirical results vary considerably depending on the methods and the samples of countries and periods. Thus neither economic theory nor earlier empirical studies can give a clear prediction of regional income convergence processes in the EU- 25 countries and their regions. Therefore further empirical analysis using modern econometric tools is an important input for elaborating regional policy instruments.

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1.3 Structural Funds

Until the 1970s, regional policy in Europe was a domestic matter. However, several factors (including the proposed enlargement to include the UK and Ireland and contemporary initiatives for a deepening of European integration), led to a greater focus on regional policy at the European level, and in 1975 a separate fund (ERDF – the European regional development fund) was created to help alleviate the principal regional imbalances within the Community. Although modest at first, EU regional support through the structural funds has grown in importance over the years and today is one of the key policy areas in the European Union.

The EU structural funds went through a major reform in 1988. The objective was to make the funds more effective in reducing the gap between advanced and less-advanced regions, and strengthening economic and social cohesion in the European Community. The financial resources allocated to these funds were also significantly increased. The reform of European regional policy, the increase in the budget and the recent slowdown of convergence all underline the need for a thorough assessment of the policy outcomes.

The current enlargement of the European Union, and the possible role that regional policy may play in an enlarged Union, further underline the need for an

improved understanding of how these policies work and what the long-run effects are. So far, such assessment has been mainly descriptive **(e.g. Commission, 1997; Bachtler and Turok, 1997; Heinelt and Smith, 1996; Staeck, 1996),** or based on simulations of large macroeconomic models **(Commission, 1999, 2001)**. The first approach consists primarily of outlining what type of investments have been made using the funds, as well as examining the characteristics and performance of the regions that have received the investments. While such a descriptive undertaking certainly yields useful insights into the working of policy, and helps us to distinguish between successful and unsuccessful cases, it cannot be seen as evidence of causality. Moreover, in most cases the sample of regions included in such analyses is too small to warrant any general conclusions. The second approach, i.e. macroeconomic simulation, has the advantage of providing more exact estimates of the growth effects of regional support. However, such estimates are arrived at in an indirect manner (as a shift in investment, for instance), rather than as an assessment of the direct outcome of changes in specific policies or support schemes. Furthermore, the estimates thus obtained depend crucially on the specific assumptions on which the model is based. Hence, it is possible that the results that come out of such simulations may depend more on the hypotheses underlying the model than on, say, what happens to regional support schemes.

1.3.1   The Impact of Structural Funds: Convergence and/or Growth?

There is a lack of clear-cut evidence concerning the impact of Structural Funds. In part, this might be related to the nature of the evaluation procedures provided for in the framework of the regulations of the Structural Funds. Of course, it is also extremely difficult to achieve specific and quantified results concerning the impacts of such wide programmes. Different approaches are possible, from a micro-economic perspective to an investigation of the impacts of Structural Funds at the macro-level through the use of econometric models **(Bradley, 2006)**. The latter approaches give rise to rather controversial results, for example, concerning the effects of Structural Funds on regional convergence. Some studies find that the Structural Funds contribute to the reduction of regional gaps while others remain doubtful or frankly sceptical **(Boldrin**

& Canova, 2003; Rodrı´guez-Pose & Fratesi, 2004). Besides macroeconomic impacts on growth (or employment), it is also difficult to achieve generalized findings about the sectoral effects of Structural Funds on industrial fabrics. Likewise, there is a scarcity of evidence concerning the specific issue of the impact of Structural Funds RTDI measures. Concrete evidence is lacking and studies tend to concentrate on single cases **(Kaufmann & Wagner, 2005)** from which general lessons cannot be inferred.

Other approaches address the issue in more qualitative terms, referring to the notion of the Community's 'value added'. Rather than impact, the value added indicates the effects obtained in addition to those resulting from the combined initiatives of national and regional authorities, as well as the private sector **(Mairate, 2006; Leonardi, 2006)**. These approaches are useful in highlighting the significant contribution of the Structural Funds on the quality of governance (e.g. diffusion of the recourse to evaluation, establishment of performance-based mechanisms, general strengthening of capabilities, etc.). Overall, 'the indirect and qualitative impact is likely to be proven more interesting than the impact on changes in the economic performance' **(Nordregio et al., 2005).**

1.4 Innovation, Competitiveness and Growth at Regional Level

The above theoretical developments give good reasons for carrying out innovation strategies at regional level. They offer well constructed arguments as to why the regional scale is appropriate. If, from an empirical perspective, we search for a validation of these theoretical arguments, we need to take at least two steps:

1. Can we confirm that the regional level is the most pertinent unit of analysis accounting forinnovation performance?
2. Is there a clear link between innovation performance and more general economic performance in terms of growth and employment?

The first issue is consubstantial to the arguments developed above and simply consists of an empirical verification of theoretical developments, i.e. whether regional economies are structuring elements in the global competition affecting the economic performance of firms **(Boschma, 2004)**. In this respect, empirical evidence is controversial. For example, **De Bruijn and Langendijk (2005)** do not confirm the relevance of the regional unit analysis to make sense of innovative capacities and rather point at national variations. On the contrary, Moreno et al. take the presence of specialized innovation clusters as a fact and investigate the determinants of these clusters at regional level **(Moreno et al., 2006; Paci & Usai, 2000)**.

The second issue takes a step back and asks: why do we need innovation in general and at the regional level in particular? In other words, is innovation more than just a buzzword, and does it actually serve wider economic objectives _ such as growth and employment? One first argument is that, given that competition is presently 'knowledgebased', innovation is necessary to keep up with the competitive pressure. The meaning of 'knowledge base' is all too often taken for granted, however. In general, it is argued that the new competitive environment is less based on cost or scale and more on 'noncost', intangible factors (e.g. speed to market, reduction of the life cycle of products, quality design differentiation, customization), all elements that have a higher knowledge content and require social capital, relational infrastructures and, in short, proximity. Keith Smith convincingly suggests that what is new about the knowledge economy is not so much the fact that knowledge is proportionally more important as an input in the production process (compared with capital), or that knowledge is proportionally more important as an output (e.g. the development of the business services sector), nor is it just about the growth effect of the high-tech sectors boom. What is more relevant is that the knowledge base for many industries is no longer internal to the industry but rather distributed across an ever wider range of technological actors and industries, what Smith refers to as the 'distributed knowledge base' at industry level **(Smith, 2000).** This is an interesting hypothesis (with important policy implications) which does not necessarily speak in favour of regions as a privileged locus of the knowledge economy.

1.5 Capital Formation, Foreign Direct Investments and economic development

Foreign direct investment has a major role to play in the economic development of the host country. Over the years, foreign direct investment has helped the economies of the host countries to obtain a launching pad from where they can make further improvements.

This trend has manifested itself in the last twenty years. Any form of FDI pumps in a lot of capital resources and technological knowledge into the economy of a country. This helps in taking the particular host economy ahead. The fact that the foreign direct investors have been able to play an important role in an economic development of the recipient countries has been due to the fact that these countries have changed their economic stances and have allowed the foreign direct investors to come in and improve their economies.

It has often been observed that the economic developing as well as underdeveloped countries are dependent on the economic developed countries for financial assistance that would help them to achieve some amount of economic stability. The economic developed countries, on their part, can help these countries financially by investing in these countries.

It has been observed that the foreign direct investment has been able to improve the infrastructural condition of a country. There is large scope of technological development of a country as well. The standard of living of the general public of the host country could be improved as a result of the foreign direct investment made in a country. The health sector of a recipient country could be benefited by the FDI. Thus it may be said that foreign direct investment plays an important role in the overall economic and social development of a country.

The private sector companies are not always interested in undertaking activities that help in improving the infrastructure of the country. This is because the gains from these infrastructural activities are made only in the long term; there are no short term benefits.

At times foreign direct investment could be provided in form of technology. Else, the money that comes in a country through the FDI can be utilized to buy or import technology from other countries. This is an indirect way in which foreign direct investment plays an important part in the context of an economic development. Foreign

direct investment can also be helpful in assisting the host countries to set up mass educational programs that help them to educate the disadvantaged sections of the society. Such assistance is often provided by the non-governmental organizations in the form of subsidies. The developing countries can also tackle a number of healthcare issues with the help of the foreign direct investment.

2   The Objectives

The aim of this thesis is to analyze selected socio-economic aspects of regional development in EU and V4 countries based on the statistic data and information available. In our thesis we introduce an analysis and comparison of selected aspects, as well as try to find out their significance and effect to convergence.

Partial objectives of this thesis are:

- Formulating a comprehensive literature review on the topic based on the sources from well-known domestic and foreign authors.
- Characterizing present situation in V4 countries from selected aspects (GDP, unemployment, GINI).
- Analyzing EU and V4 convergence from the socio-economical point of view:
    - ➢ GDP per capita
    - ➢ Unemployment rate
    - ➢ GINI coefficient
- Calculating beta and sigma - convergence in case of GDP for the countries analyzed and sigma convergence in case of unemployment and GINI index applying the approach of logarithmic regression.

3 The methodology

      This section will explain the method for the empirical testing and the analysis of the model used. In order to examine convergence between the V4 countries and convergence between EU27 the analysis is divided in two parts.

- In the first part we examine if there has been any convergence between the studied countries between the years 1999-2009. This analysis is performed at the countries level. Two kinds of convergence theory models are used; σ-convergence and absolute β-convergence (Sala-i-Martin, 1996).

- In the second part we examine the growth of the indicators employment, GDP and GINI index. These indicators are chosen because they quite well represent the development of EU countries.

The observations are collected at the countries area level from Eurostat and Statistical Office of the Slovakia.

Model of β-convergence and σ-convergence

There are two ways of measuring convergence, β-convergence and σ-convergence. Absolute β-convergence occurs when β is negative. This implies that poor economies tend to grow faster than rich ones. σ-convergence occurs if the dispersion of the economies' real per capita GDP levels tend to decrease over time. It is important to note that the existence of β-convergence is a necessary condition for σ-convergence. In the case of similar economies such as regions within a country it is more likely to find absolute β-convergence as well as σ-convergence. This is the reason why this study will only estimate absolute β-convergence (Sala-i-Martin, 1996).

To control if the poorer regions are growing faster than the richer ones, the absolute β -convergence model is used. Equation 1 is used to estimate absolute convergence (Gullstrand & Hammarlund, 2007):

$$\ln \left(\frac{Y_t}{Y_{t-T}} \right)_i = \propto + \beta ln(Y_{t-T})_i + \varepsilon$$

Calculating beta and sigma - convergence in case of GDP for the countries analyzed and sigma convergence in case of unemployment and GINI index applying the approach of logarithmic regression.

Variable	Definition	Explanation
$\left(\dfrac{Y_t}{Y_{t-T}}\right)_i$	GDP per capita growth 1999-2009, unemployment 1999-2009 and Gini index between 2005-2009 in EU27 or V4 where Yt is the (GDP or unemployment or Gini) in 2009 and Yt-T is (GDP or unemployment or Gini) in 1999 resp. 2005	
$(Y_{t-T})_i$	Initial (GDP, unemployment, Gini) per capita in 2000 in EU27 and V4	

Parameter	Definition	Explanation
β	Convergence coefficient: indicates the existence and speed of convergence.	A negative β indicates β-convergence between the countries. Meaning that the countries with an initially lower GDP/capita tend to grow faster than the countries with a higher initial GDP/capita.
∝	Constant	
σ	Standard Deviation of ln (Yt-T)i	σ-convergence is observed when: σt-T> σt. Hence, if the dispersion of variable is larger at time t-T than at time t we have σ-convergence. Meaning that the variance of variable decreases over the years and the disparities between the countries are decreasing.

4 The research results and discussion

4.1 Analysis of present situation in EU 27 and V4 countries

The euro area (EA17) consists of Belgium, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Luxembourg, Malta, the Netherlands, Austria, Portugal, Slovenia, Slovakia and Finland.

The EU27 includes Belgium (BE), Bulgaria (BG), the Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), France (FR), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), the Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI), Sweden (SE) and the United Kingdom (UK).

4.1.1 Unemployment

Total number of able men and women of working age seeking paid work. Unemployment statistics vary according to how unemployment is defined and who is deemed to be part of the workforce. Traditional methods for collecting unemployment data are based, typically, on sampling or the number of unemployment benefit requests. International labour organization (ILO) computes unemployment on the basis of number of people who have looked for employment in the last four weeks and are available to start work within two weeks, plus those who are waiting to start working in a job already obtained.

In a few words it means being involuntarily out of work. The government defines unemployed as people who are jobless, looking for jobs, and available for work.

Unemployment describes the state of a worker who is able and willing to take work but cannot find it. As indicated by the unemployment rate and other yardsticks, unemployment is an important measure of the economy's strength. A high unemployment rate generally indicates an economy in recession with few job opportunities, while a low unemployment rate points to an economy running at or near full throttle. A low unemployment rate has its downside for stock prices, however: it may be a harbinger of higher interest rates that will slow both an overheated economy and the rise in equity values. In recent years, there's been much controversy over what

the true level of unemployment is. Some economists have relied more on the government's "establishment survey data," which emphasizes the number of new jobs, rather than "household survey data," which is used to compute the headline unemployment rate. Moreover, new technologies and lifestyle changes, which are increasing the number of temporary, contract, and self-employed workers, are making it more difficult to define what unemployment is.

Unemployment is expressed as a percentage of the total available work force. The level of unemployment varies with economic conditions and other circumstances.

Calculation of unemployment rate:

Unemployment rate (%) = Unemployed workers

Total labour force

Summary of Unemployment Types

- Demand Deficient Unemployment. – Lack of AD in economy (e.g. Recession)
- Structural Unemployment – workers lack necessary skills or geographical immobility
- Real Wage Unemployment – wages above equilibrium
- Frictional unemployment – workers in between jobs
- Voluntary Unemployment. – workers prefer not to work

Unemployment in V4 countries

The euro area (EA17) seasonally-adjusted unemployment rate was 9.9% in February 2011, compared with 10.0% in January. It was 10.0% in February 2010. The EU27 unemployment rate was 9.5% in February 2011, compared with 9.6% in January. It was 9.6% in February 2010.

Eurostat estimates that 23.051 million men and women in the EU27, of whom 15.747 million were in the euro area, were unemployed in February 2011. Compared with January 2011, the number of persons unemployed fell by 99 000 in the EU27 and by 77 000 in the euro area. Compared with February 2010, unemployment decreased by 31 000 in the EU27 and by 77 000 in the euro area.

These figures are published by Eurostat, the statistical office of the European Union. Among the Member States, the lowest unemployment rates were recorded in the

Netherlands (4.3%), Luxembourg (4.5%) and Austria (4.8%), and the highest in Spain (20.5%), Lithuania (17.4% in the fourth quarter of 2010) and Latvia (17.3% in the fourth quarter of 2010).

Compared with a year ago, the unemployment rate fell in thirteen Member States, remained stable in two and increased in twelve. The largest falls were observed in Latvia (20.1% to 17.3% between the fourth quarters of 2009 and 2010), Estonia (16.1% to 14.3% between the fourth quarters of 2009 and 2010) and Sweden (8.8% to 7.6%). The highest increases were registered in Greece (10.2% to 14.1% between the fourth quarters of 2009 and 2010), Bulgaria (9.4% to 11.6%) and Ireland (13.0% to 14.9%).

Between February 2010 and February 2011, the unemployment rate for males fell from 9.9% to 9.7% in the euro area and from 9.8% to 9.5% in the EU27. The female unemployment rate increased from 10.1% to 10.2% in the euro area and from 9.4% to 9.6% in the EU27.

In February 2011, the youth unemployment rate (under-25s) was 19.4% in the euro area and 20.4% in the EU27. In February 2010 it was 20.5% and 20.9% respectively. The lowest rates were observed in the Netherlands (7.4%) and Germany (7.9%), and the highest in Spain (43.5%) and Greece (36.1% in the fourth quarter of 2010).
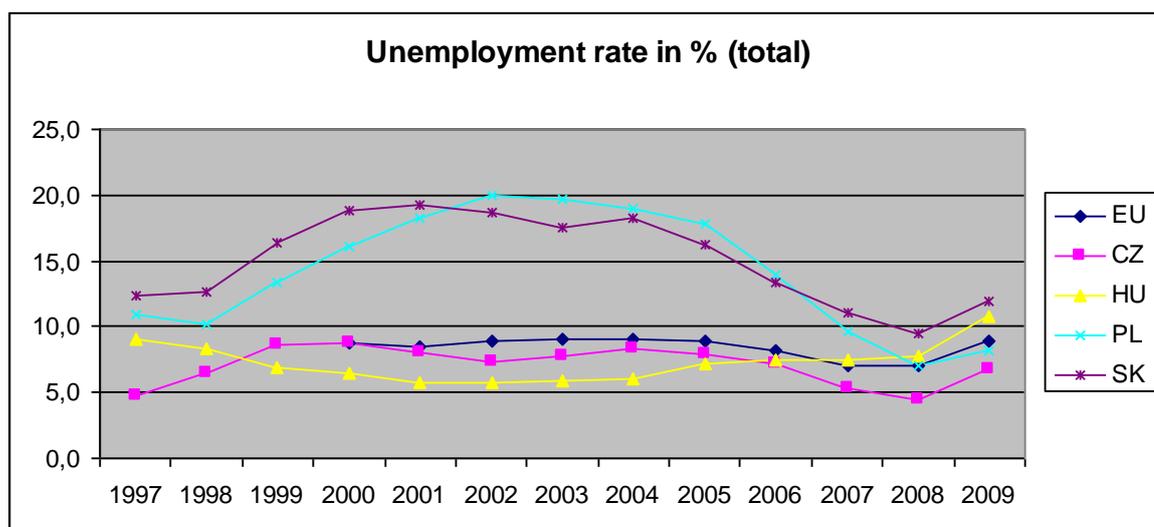
Figure 1: Unemployment rates in present situation
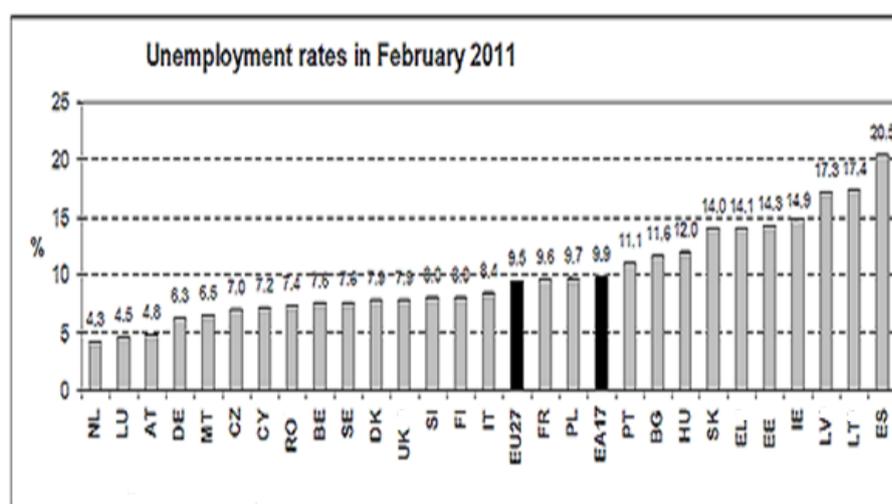
Source: Eurostat

Unemployment in V4 countries and EU27

Figure 2: Unemployment rate in % (total)

Unemployment rate in % (total)

Slovakia

Unemployment rate in Slovakia has been quite stable during the transition years about 12% all the time, but after the year 2000 the unemployment rate grew to 19,3% and Slovakia was marked as one of the countries with the highest unemployment rate in Visegrad Group as well as in Europe, which presented an important barrier for economic growth and competitiveness of economy.

The trend of extremely high unemployment rate persisted until the beginning of 2004, when Slovakia entered the EU and creation of new jobs and also economic reforms contributed to decrease of unemployment. Many Slovaks have got the opportunity to moved to work to countries such as Ireland or the United Kingdom that cancelled barriers to free movement of labour. From this year, jobless rate started decline because of opened borders in the EU on one hand, and also because of entering new car industry investors on Slovak market in 2006 and 2007 on other hand – PSA Peugeot Citroen in Trnava and Kia Motors in Žilina. In 2008 Slovakia reached the lowest unemployment figures in more than 10 years that was 9,5%, but since 2009 started to rise again till 11,9%, when many people lost their jobs caused by closing many factories or by production layoffs on the ground of economic crises.

Czech Republic

The economic transformation is accompanied by high levels of unemployment during the transitional period, but in case of the Czech Republic, the transition has been accomplished with substantially lower levels of unemployment than in other countries, therefore Czech labour market has been the most efficient among the V4 countries. In 2000 was the unemployment rate increased to 8,7%, that was the highest rate during the whole examined period and also it was the biggest increase since break – up Czechoslovakia in 1993. Generally, the unemployment in the Czech Republic is lower than the average of all the countries of European Union as we can see in the **Chyba! Nenašiel sa žiaden zdroj odkazov.**.

Poland

During the period 1997 – 2002 the polish economy recorded large decline that was the cause for the growth in unemployment. While in 1997, the unemployment rate shows 10, 9% and in 1998 only 10, 2%, in 1999 started to climb from year to year up to 20% in 2002. Problem was in fact, that when new technologies have been introduced in enterprises, the employed people stayed redundant and there was not another space for creating new jobs. Another reason for unemployment growth could be a decline in a number of small and medium sized private enterprises, but also reform of the pension and health insurance system made in 1999.

Poland is a very large country, the biggest one from V4 countries, therefore it is understandable that there are considerable territorial differences in the level of unemployment in different regions of Poland. This territorial differences and an economic classification of voivodships are measured in various ways. The regions could be classify into developed agricultural, other agricultural, developed heavily industrialized, other industrialized, developed diversified, and other diversified.

The factors responsible for Poland´s unfavourable labour market trends could include also demographic conditions, weaknesses in education, inappropriate social protection policies, and structural changes in the labour market. Poland has relatively unfavourable business and investment climate, ineffective decentralization of labour market regulation, and high taxes on labour.

As in the case of other new EU members, also for Polish people came into consideration the opportunity to move to another EU countries and to find legal temporary employment that is financially more attractive. The Polish people embrace this opportunity, but after the large waves of inhabitants moved away, there arised the

phenomenon of labour shortages in some sector of national economy. The domestic employers struggle the free labour positions filled by migrants arriving from neighbouring states such as Ukraine or Belarus, but also from more distant countries such as Vietnam and North Korea. Despite of this current problem, the labour market of Poland can be viewed as a optimistic developing one, what confirm also the fact that the unemployment rate of Poland fell on the European average in the last two years of analyzed period (2008, 2009).

Hungary

After the fall of socialism in Hungary, many skilled workers were discharged. The economy absorbed graduates that had no problems finding job. But this trend lasts until 2000, when the recession hit and the job marked has changed. Lower prestige universities suddenly lost their value and many graduates stayed long employed.

However, the unemployment rate was relatively stable during the years 1997 – 2008, only in the 2009 the rate jumped at 10,8% caused a shortage of vacancies resulting from economic crises. The lowest unemployment was recorded in 2001, it was 5, 7%, and the highest in 1997, it was 9, 0%. The unemployment rate started to grow in Hungary in 2007 and 2008, it was 7, 4% and 7, 8% respectively whereby it passed the EU average as we can see in Figure 2. Hungary also with the Czech Republic had the lowest unemployment rate from all Visegrad group countries during analyzed period in general. Hungary has ageing population problem, and the numbers of people of working age continues to decline.

The statistics of the Hungarian labour market have shown adverse effect in the recent past. Although employment did not grow, the number of unemployed also decreased. The main role in falling unemployment played a cutback of the length of the unemployment benefit and as a result was a decline in the number of persons authorized to unemployment benefits.

4.1.2   Gross domestic product

In economics, GDP means Gross Domestic Product. GDP is defined as the value of all goods and services produced within the geographic territory of an economy in a given interval, such as a year. GDP is distinguished from GNP, or Gross National Product, which is defined as the value of goods and services produced in a given interval by factors of production owned within an economy. More simply, GDP

measures income generated within a territory whereas GNP measures income received within it. GDP and GNP are the most commonly known measures of national income and output. Nominal GDP is a measure of money spent. Real GDP corrects the gross nominal GDP figure for inflation, making real GDP more useful for historical comparison. Nominal GDP is sometimes called money GDP, and real GDP is sometimes called inflation-corrected GDP or constant price GDP. A well-known textbook formula defines GDP as the sum of consumer expenditure, business investment, government expenditure, and next exports. US GDP statistics are compiled and released quarterly by the Commerce Department's Bureau of Economic Analysis.

For a region, the GDP is "the market value of all the goods and services produced by labour and property located in" the region, usually a country. It equals GNP minus the net inflow of labour and property incomes from abroad

Calculation of GDP:

Spending (expenditure) method of calculating gross domestic product

GDP = C + Ig + G + Nx

NNP = GNP - depreciation

GNP= GDP + Factor Payments from Abroad – Factor Payments to Abroad

C - consumption - purchases of nondurable consumer goods (milk, bread) and durables (car, house) and services

I - investment - investment goods produced - the sales Ig (gross) = Ir (restituted) + In (net)

G - government - government expenditures for the purchase of goods and services (not transfer payments)

Nx - net exports - the difference between exports and imports

$$Real\ GDP_t = \frac{(Nominal\ GDP_t) * 100}{(GDP\ Deflator_t)} \qquad t = \text{in this time period}$$

Table 1: Real GDP growth rate - percentage change on previous year

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
EU	3,0*	3,9*	2,0*	1,2*	1,3*	2,5**	2,0**	3,1**	2,9***	0,9***	-4,2***
CZ	1,3	3,6	2,5	1,9	3,6	4,5	6,3	6,8	6,0	3,2	-4,8
HU	4,2	5,2	4,1	4,4	4,3	4,7	3,9	4,0	1,2	0,6	-6,5
PL	4,5	4,3	1,2	1,4	3,9	5,3	3,6	6,2	6,6	5,0	1,7
SK	0,0	1,4	3,4	4,8	4,7	5,2	6,5	8,5	10,4	6,4	-5,8

* EU 15   **** EU 25**   ***** EU 27**

Source: Eurostat

GDP is commonly used as an indicator of the economic health of a country, as well as to gauge a country's standard of living. Critics of using GDP as an economic measure say the statistic does not take into account the underground economy - transactions that, for whatever reason, are not reported to the government. Others say that GDP is not intended to gauge material well-being, but serves as a measure of a nation's productivity, which is unrelated.

Table 2: Growth rates of GDP (2010)

	Percentage change compared with the previous quarter				Percentage change compared with the same quarter of the previous year			
	2010				2010			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
EA16	0.4	1.0	0.3	0.3	0.8	2.0	1.9	2.0
EU27	0.4	1.0	0.5	0.2	0.6	2.0	2.2	2.1
EA17[1]	0.4	1.0	0.3	0.3	0.8	2.0	1.9	2.0
Member States								
Belgium	0.1	1.1	0.4	:	1.7	2.7	2.0	:
Bulgaria	-0.5	0.5	0.7	1.7	-0.8	-0.3	0.5	2.1
Czech Republic	0.7	0.8	0.9	0.5	1.0	2.3	2.8	2.9
Denmark	0.7	1.3	1.0	:	-0.9	2.8	3.4	:
Germany	0.6	2.2	0.7	0.4	2.1	3.9	3.9	4.0
Estonia**	1.0	1.9	0.7	2.3	-2.6	3.1	5.0	6.6
Ireland	2.1	-1.0	0.5	:	-1.1	-1.8	-0.7	:
Greece	-1.9	-1.8	-1.7	-1.4	-0.7	-5.1	-5.7	-6.6
Spain	0.1	0.3	0.0	0.2	-1.4	0.0	0.2	0.6
France	0.3	0.6	0.3	0.3	1.2	1.6	1.7	1.5
Italy	0.4	0.5	0.3	0.1	0.5	1.3	1.2	1.3
Cyprus	0.6	0.6	0.8	0.3	-1.0	0.5	1.8	2.2
Latvia	1.0	1.2	0.9	1.1	-5.1	-2.6	2.5	3.7
Lithuania	1.4	1.0	0.3	1.7	-1.9	1.2	1.6	4.4
Luxembourg	-0.1	0.9	1.5	:	1.4	5.5	3.6	:
Hungary	1.4	0.2	0.6	0.2	-0.6	0.8	2.2	2.4
Malta	1.4	0.1	0.5	:	3.9	4.1	3.7	:
Netherlands**	0.4	1.0	0.1	0.6	0.5	2.2	1.8	2.4
Austria	0.0	1.2	0.9	0.6	0.2	2.2	2.5	2.7
Poland	0.7	1.2	1.3	:	3.1	3.8	4.7	:
Portugal	1.1	0.2	0.2	-0.3	1.7	1.4	1.3	1.2
Romania	-0.3	0.3	-0.7	0.1	-3.2	-1.5	-2.2	-0.5
Slovenia	-0.1	1.0	0.3	:	-0.2	1.4	1.3	:
Slovakia	0.7	0.9	0.9	0.9	4.5	4.2	4.0	3.4
Finland	0.1	2.6	0.5	2.5	0.6	4.4	3.5	5.8
Sweden	1.7	2.0	2.1	:	2.8	4.5	6.8	:
United Kingdom	0.3	1.1	0.7	-0.5	-0.3	1.6	2.7	1.7

In table 2 we can see that GDP increased by 0.3% in the euro area (EA16- The euro area (EA16) consisted of 16 Member States up to 31 December 2010: Belgium, Germany, Ireland, Greece, Spain, France, Italy, Cyprus, Luxembourg, Malta, the Netherlands, Austria, Portugal, Slovenia, Slovakia and Finland. From 1 January 2011 the euro area (EA17) also includes Estonia.) and by 0.2% in the EU27 during the fourth quarter of 2010, compared with the previous quarter, according to flash estimates published by Eurostat, the statistical office of the European Union. In the third quarter of 2010, growth rates were +0.3% in the euro area and +0.5% in the EU27.

Compared with the same quarter of the previous year, seasonally adjusted GDP increased by 2.0% in the euro area and by 2.1% in the EU27 in the fourth quarter of 2010, after +1.9% and +2.2% respectively in the previous quarter.

Over the whole year 2010, GDP increased by 1.7% in both the euro area and the EU27.

Figure 3: Real GDP growth rate - percentage change on previous year
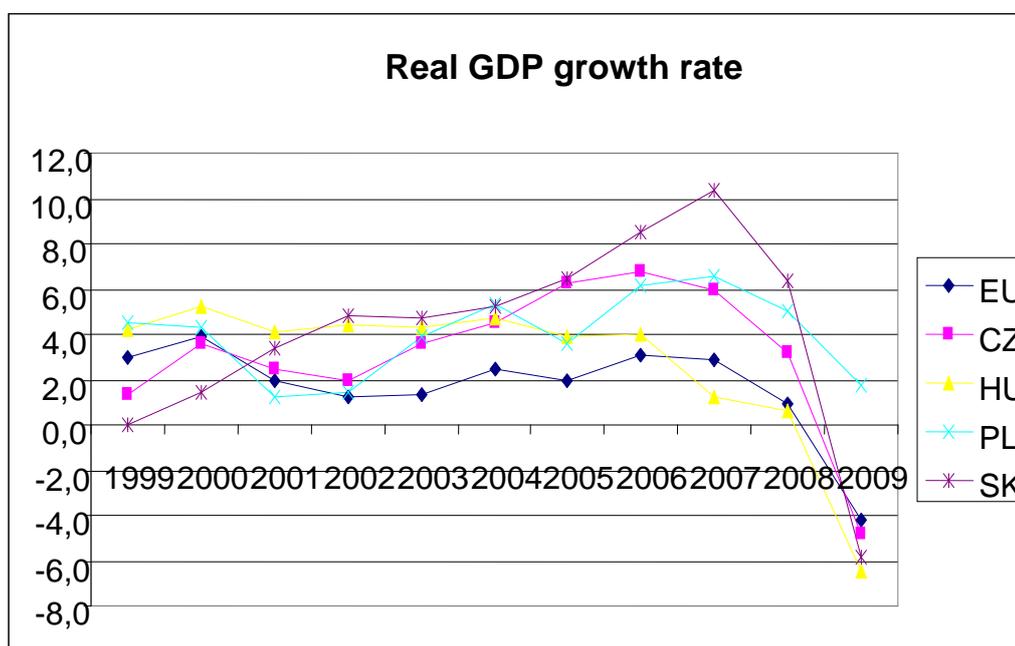
Source: own calculation

Slovakia

Fast economic growth in Slovakia between 1994 – 1998 was based for the most part on foreign securities and directed to an increased foreign indebtedness. Fault in both, internal and external balances alighted the issue of sustainability of the economic

policy. Large growth was appreciatory to infrastucture projects and it didn´t involve processing industry. Industrial pursuance stayed week: the share of low-value added goods was high.

Slovakia occured in the period of substantial privatisation after the break-up of the Czechoslovak republic in 1993, and state-owned assets were trasferred to private means.

The economic growth in 1999 totally decreased to zero. However, the impact of the restrictive measure worse off gradually , the additional growth in domestic demand reinstated GDP growth to 4,8% in 2002, setting the basis for medium-term maintainable development. The rate of GDP growth was similar also in 2003 and in two years later, in 2005, Slovak economy reached the position of the most dynamic growth in Central Europe worth of 6,5%.

The growth rate raised to 8,5% in 2006, when the new car factories of PSA Peugeot Citroen and Kia Motors started producing and exporting. In 2007, the economic growth was on the level of 10,4%. This tempo was mostly drived by the automobile industry, by producing of engines and trasportation means and by manufactoring in electrotechnical industry.

Czech Republic

In the Czech Republic was the situation similar. Public ownership during Soviet times and long years of stringent state control caused that the economy of Czech Republic collapsed in 1998 and fall into recession. In some years later the country started to benefit because of aggressive reform policy, which involved a plan of mass privatisation and general reconditioning of the country´s financial system. Economy of the Czech republic passed through some important structural changes between the years 1993 and 2006. Above all, the proportion of agriculture and industry in the country´s GDP decreased and the share of service sector increased, but this effect occured in all regions of the country with different intensity.

Positive growth of GDP caused also other developments as an increase in the workforce and decrease in unemployment, a sharp fall in the budget deficit related to GDP, giving priority to domestic supply and demand, growth in gross national savings and reducing gross capital financing from external sources. A drop in the balance of

payment deficit related to GDP and to foreign borrowing also helped to the overall enhancement of the international investment position of the Czech Republic.

Poland

After 1995 in Poland, the investment activities and domestic demand became a driving power of the economy. Between the years 1995 and 1997, the investments rose annually by over 20% on average. In 2001, total investments as percentage of GDP decreased by 3% resulting in a moderate economic growth, which in 2000 slowed down to 4,3%, mainly caused by tight monetary policy limiting domestic demand and decline in investment. The trend continued in 2001, when the rate of growth reached only 1,2% and also in 2002 was the growth quite moderate, only 1,4%. It was supported by private consumption, lower inflation followed by higher real income as well as increasing export.

Although Poland has made an excellent transition to an open – market economy, there is still a lot of work to perform a country´s position. Perhaps the most problematic area is the large and inefficient agricultural sector and also the unprofitable sectors of the large heavy industry. Major investments in rural infrastructure and education are needed to solve the problem.

Hungary

During the years 1990 – 1993, Hungary´s GDP droped sharply about 18% and the economy of Hungary fell into the so-called second transition crises thanks to high internal and external deficit that also increased already accumulated foreign debt.

In 1996 the GDP started to grow about 1% - 1,5 % and in 1997 rose GDP to 4,4%, because of strong export improvement and modernization of the export structure, to which contributed large foreign direct investment inflow. In this year the government started to concentrate on important structural reforms such the performance of fully funded pension system, higher education reform and formation of a national treasury. Other economic challenges involving reducing of fiscal deficits and inflation, keeping up stable external balances, health care and local government financing, and structural reforms of tax system were completed in 1998. In 2000, the GDP grew to 5,2%, but then decreased again slightly to 4,1% in 2001, which was the highest growth rate among the Visegrad countries.

Hungary´s GDP rose to 4,0 % in 2006, but this figure was below market expectations of a 4,2% rise. Output declined in all sectors of the economy, except for construction and agriculture, because of a sharp drop in demand from the eurozone coupled with domestic fiscal tightening. In 2008 Hungary´s economic growth hit the bottom of 0,6%.

Analyzed years 1999 - 2008 were for countries of Visegrad Group epoch - making period. Countries passed from the communist regime to a market economy and democracy.

Historical facts are reflected in the overall development of the economy and how we can see at first sight in the **Chyba! Nenašiel sa žiaden zdroj odkazov.**, the economy of V4 countries has gone the right direction. Slovakia's GDP growth is most evident. While in 1999 the growth has stagnated, in 2002 has proceeded to 4,8% at close spacing with Hungary, which has reached 4,4% growth. In 2004, Slovakia has shown 5.2% growth, and legged behind Poland only about 0,1%. A number of economic factors has imposed that since this year Slovakia has become a country where GDP growth accelerated substantially. Till 2007, Slovakia has achieved economic growth of 10,4% and become the most powerful economy between V4 countries and even more interesting area for foreign investors. Value of GDP of the other V4 countries was far behind the value of GDP of Slovakia.   The second most powerful economy in 2007 has been Poland with 6,6% of GDP growth rate, closely followed by Czech Republic with 6,0% growth. Hungary had the lowest GDP growth significantly, only 1,2%, which lagged well behind the average of the EU, which in 2007 was 2,9%. Economic growth, especially in Slovakia, was balanced this year, supported by growth in domestic and foreign demand. In 2008 the situation has changed. The U.S. financial crisis had resulted in the slowdown of economic activity not only in the V4 countries but throughout the whole EU. On one hand, the growth of employment has had positive effect on economic development but on the other hand, this growth was decelerated by less dynamic exports.

In 2008, Slovakia has achieved economic growth of only 6,4% but compared to other affected countries of V4 Group, Slovakia was in a better position. Poland reached a GDP growth of 5%, Czech Republic 3,2% and Hungary only 0,6%. Average GDP growth in EU 27 was also significantly deteriorated from 2,9% in 2007 to 0,9% in 2008.
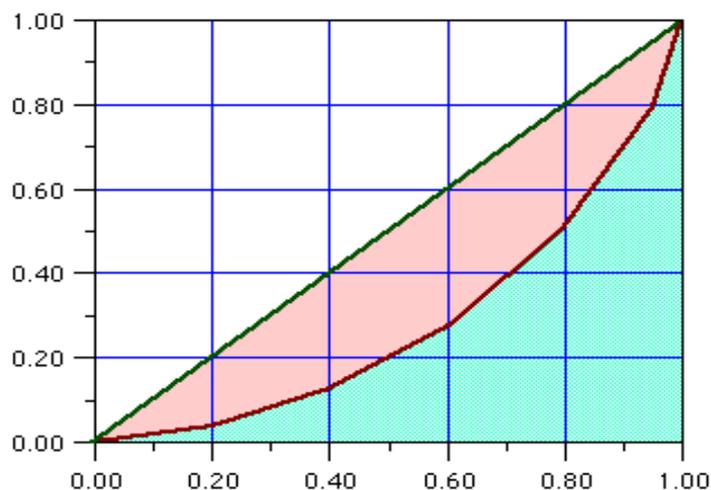
4.1.3 GINI coefficient

Standard economic measure of income inequality, based on Lorenz Curve. A society that scores 0.0 on the Gini scale has perfect equality in income distribution. Higher the number over 0 higher the inequality, and the score of 1.0 (or 100) indicates total inequality where only one person corners all the income. It is used also as a measure of other distributional inequalities such as marke share. Named after its inventor, the Italian statistician Corrado Gini (1884-1965). Also called Gini coefficient or index of concentration.

Lorenz Curves and Gini Coefficients can be used to gain insights into a range of cases in which inequality is seen as a policy issue. It is inevitable that there will be considerable variation between countries since, to varying degrees, each will have different resource endowments and institutional norms which will have driven and constrained its historical, political and social development.

The Lorenz Curve construction also gives us a rough measure of the amount of inequality in the income distribution. The measure is called the Gini Coefficient. Computation of the Gini Coefficient is illustrated by Figure 4 below.

Figure 4: Lorenz Curve and Gini Coefficient

Source: http://faculty.lebow.drexel.edu/McCainR//top/prin/txt/factors/dist4.

To compute the Gini Coefficient, we first measure the area between the Lorenz Curve and the 45 degree equality line. This area is divided by the entire area below the 45 degree line (which is always exactly one half). The quotient is the Gini coefficient, a

measure of inequality. In other words, the Gini coefficient is the area shaded in pink divided by the total of the areas shaded in pink and light blue-green.

For a perfectly equal distribution, there would be no area between the 45 degree line and the Lorenz curve -- a Gini coefficient of zero. For complete inequality, in which only one person has any income (if that were possible) the Lorenz curve would coincide with the straight lines at the lower and right boundaries of the curve, so the Gini coefficient would be one. Real economies have some, but not complete inequality, so the Gini coefficients for real economic systems are between zero and one.

Table 3: GINI coefficient in V4 2005-2009

GEO/TIME	2009	2008	2007	2006	2005
EU27 (average)	30,4	30,7	30,6	30,2	30,6
Czech Republic	25,1	24,7	25,3	25,3	26,0
Hungary	24,7	25,2	25,6	33,3	27,6
Poland	31,4	32,0	32,2	33,3	35,6
Slovakia	24,8	23,7	24,5	28,1	26,2

Source: Eurostat

4.2 Convergence of unemployment, GDP and GINI in EU27 and V4 countries

4.2.1 Convergence of GDP

4.2.1.1 EU27

As can be observed in next table 4 a negative β is observed at EU27 countries. This implies that we can conclude that there has been a process of convergence between EU countries from 1999-2009. The result is that β-convergence is confirmed.

Table 4: Regression result from OLS estimation of absolute convergence

Variables	EU 27 1999-2009
α	3,59697
t-stat	13,51485
β	-0,32877
t-stat	-11,5417

Source: own calculation

In figure 5 the growth rate versus the GDP per capita is presented. The log of the GRP per capita for 1999 is depicted on the horizontal axis while the growth rate of per capita GRP between 1999-2009 is depicted on the vertical axis. The regression result indicates that the estimated speed of convergence, β is negative. Thus the slope of the regression line is negative. From the convergence perspective, this is positive. Since the countries with initially lower GDP are growing faster than the richer ones, meaning that they tend to grow towards equal levels. Therefore β-convergence occurs. However on the other hand, σ -convergence is not confirmed. A possible reason why it does not occur at the EU is that it is easier for smaller and less developed countries which are more similar to each other to converge than for developed countries which tend to be more dissimilar to each other. This reasoning is in line with Sala-i-Martin's (1996) convergence theory which states that less developed countries of EU are more likely to converge towards each other in an absolute sense than richer countries.

Figure 5: Growth rate vs. initial level of GDP/capita in EU 27
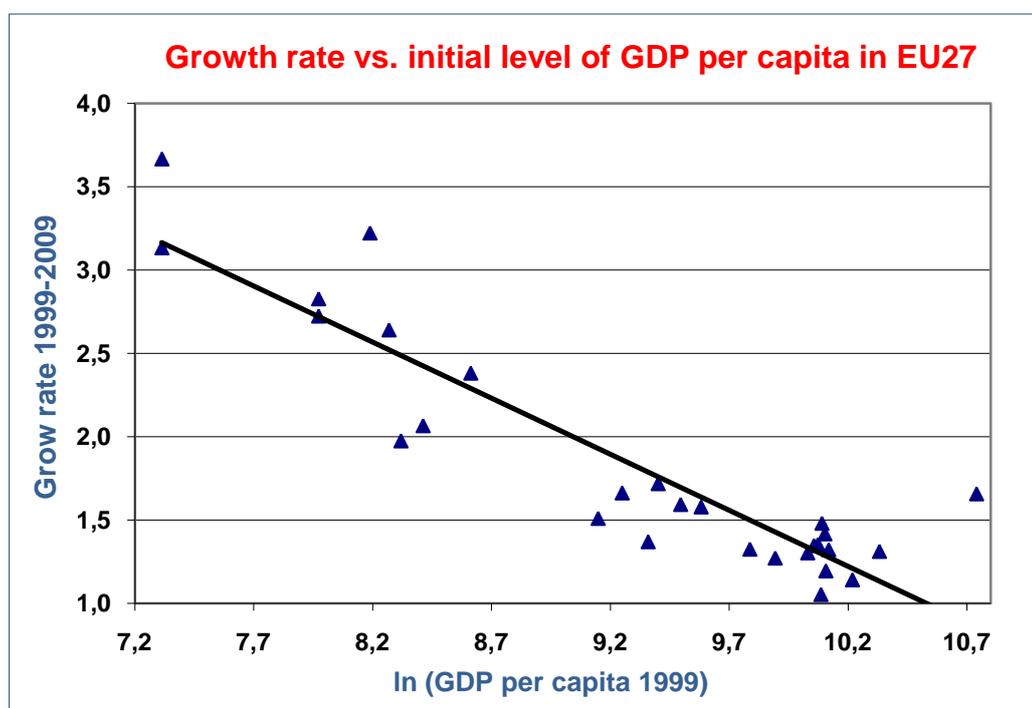
According to the table 5 the requirements for σ -convergence does not hold, neither on the EU27 countries since sigma t-T is smaller than sigma t. It means that the

standard deviation for 1999 is smaller than the standard deviation for 2009. Sigma convergence is not confirmed.

Table 5: Descriptive statistics of per capita GDP in EU27, for σ-convergence

|	t = 2009	t-T=1999
ln (mean)	10,04	9,65
ln (st.dev)	9,60	9,32

Source: own calculation

sigma t > sigma t-T

[σt-(σt-T)]= 0,29

Figure 6 show the dispersion of the GDP per capita where the years 1999-2009 are depicted on the horizontal axis and the log of the standard deviation of GRP per capita are depicted on the vertical axis. It is obvious that the dispersion between EU27 countries have been increasing from 1999 to 2009. This means that there is no sign of σ-convergence and that the disparities between the regions are rather increasing than decreasing. An interesting phenomenon is the cyclical pattern in the diagrams which shows that the dispersions increase when the economy is expanding while the dispersions decrease in recessions.

Figure 6: Disparities of per capita GDP in EU27

Disparities of per capita GDP in EU27
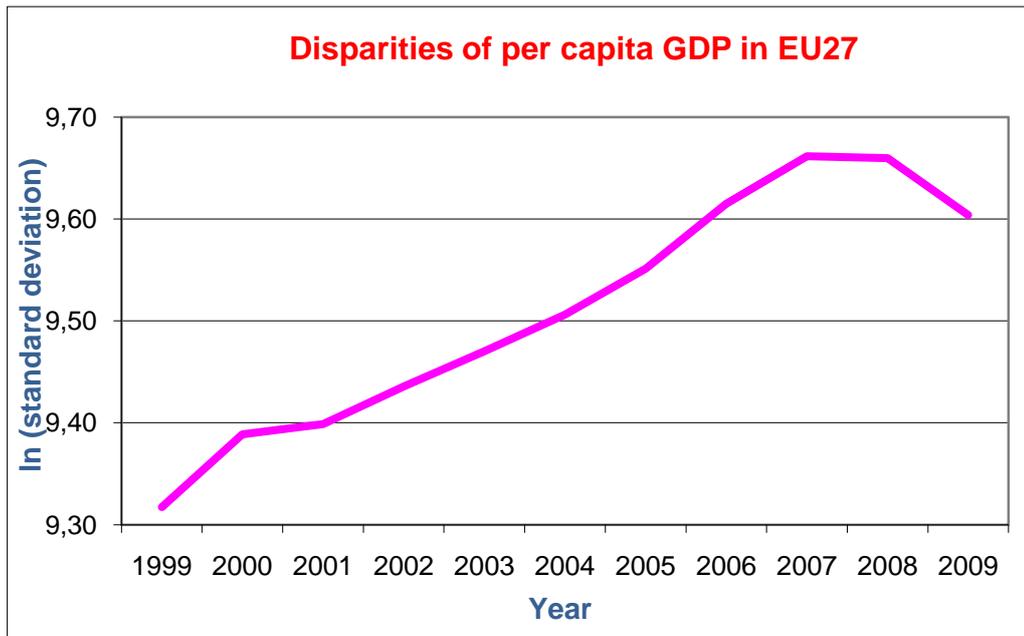
4.2.1.2   V4 countries

β-convergence regression of V4 countries is not possible because we have not enough data for regression. In the next diagram we can see convergence trend which means that V4 countries with lower GDP per capita as is average of EU27 have higher growth rate of GDP than the EU27.

In figure 7 the growth rate versus the GDP per capita is presented. The log of the GDP per capita for 1999 is depicted on the horizontal axis while the growth rate of per capita GDP between 1999-2009 is depicted on the vertical axis. Since the countries with initially lower GDP are growing faster than the richer ones, meaning that they tend to grow towards equal levels. Therefore β-convergence occurs. However the value is only statistically significant at the urban area level, meaning that we can only conclude that β-convergence occurs at the urban area level. A possible reason why β-convergence does not occur is that it is easier for smaller and less developed countries which are more similar to each other to converge than for developed countries which tend to be more dissimilar to each other. This reasoning is in line with Sala-i-Martin's (1996) convergence theory which states that smaller regions within a country are more likely to converge towards each other in an absolute sense than countries.

Figure 7: Growth rate vs. initial GDP/per capita in V4 and average of EU27

Growth rate vs. initial GDP/per in V4
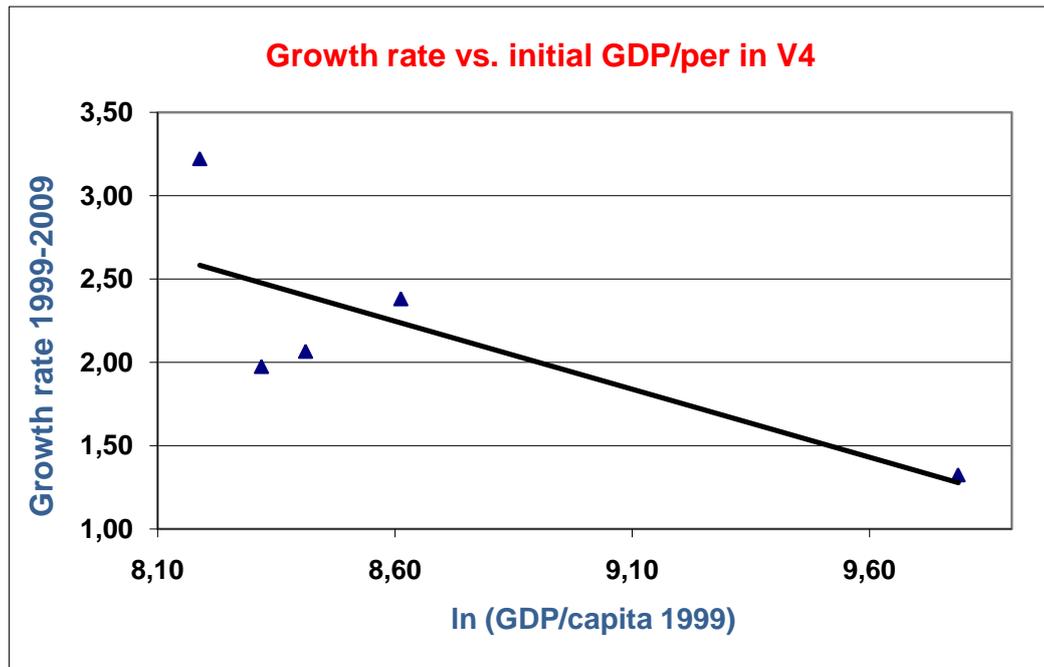
Source: own calculation

The requirements for σ -convergence does not hold because it is positive (1, 03) which means that *sigma t > sigma t-T*. Meaning that the standard deviation for 1999 is bigger than the standard deviations for 2009. Sigma convergence is not confirmed.

Table 6: Descriptive statistics of per capita GDP in V4, for σ-convergence

|	t=2009	t-T=1999
ln (mean)	9,26	8,40
ln (std.dev)	7,72	6,69

Source: own calculation

$$\text{sigma t} > \text{sigma t-T}$$
$$[\sigma t-(\sigma t-T)]= 1,03$$

Next figure 8 show us that the dispersion of the GDP per capita where the years 1999-2009 are depicted on the horizontal axis and the log of the standard deviation of GDP per capita are depicted on the vertical axis. It is obvious that the dispersion have been increasing from 1999 to 2009. This means that there is no sign of σ-convergence and that the disparities between the countries are rather increasing than decreasing. An interesting phenomenon is the cyclical pattern in the diagrams which shows that the dispersions increase when the economy is expanding while the dispersions decrease in

recessions. In the 1999-2009 years we can see that the dispersion increase almost in constant pattern. But in the years 2000 till 2002 there were bigger expanding of economy which means more available jobs in labour market and steeper slope of dispersion. After the 2002 economy was slowing down which means increasing of disparities. The profits that the economy experience in prosperous business cycles does not reach the most disadvantaged countries. Hence, the distribution of income becomes unequal when the economy as a whole is improving.

Figure 8: Dispersion of per capita GDP in V4 countries
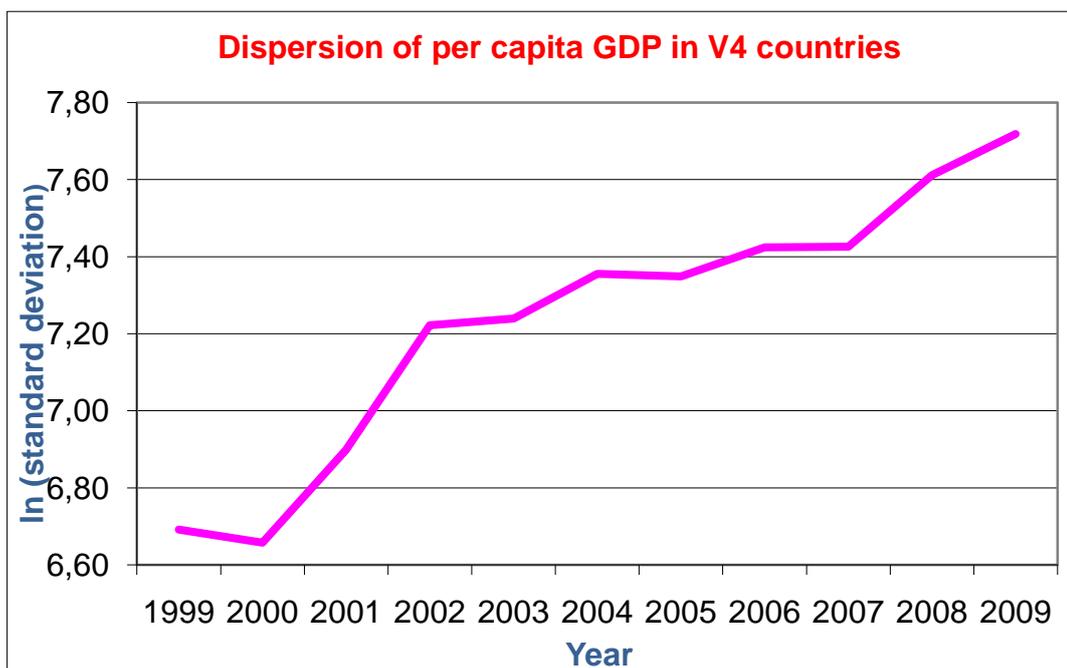
4.2.2   Convergence of unemployment

4.2.2.1   EU27 countries

All of the EU27 countries have similar problems in unemployment task which are very hard to solve in long run term. One of the main reasons of high unemployment

in all EU member states is their structural problem in respective economies, consequently reflected in long-term unemployment. Therefore in this indicator EU countries have similar values and especially V4 countries even though they have made big progress in reforming their economies, convergence of EU unemployment figures show that they are not successful in resolving this difficult task.

Table 7: Descriptive statistics of unemployment, for σ-convergence

	t = 2009	t-T=1999
ln (mean)	2,18	2,15
ln (st.dev)	1,25	1,34

$$sigma\ t\text{-}T > sigma\ t$$
$$[\sigma t - (\sigma t\text{-}T)] = -0,08$$

The condition for σ -convergence has been met because it is negative (-0,08) and *sigma t-T > sigma t*. Meaning that the standard deviation for 1999 is bigger than the standard deviations for 2009. Sigma convergence is confirmed.

**Figure 9**: Unemployment rate dispersion in EU27
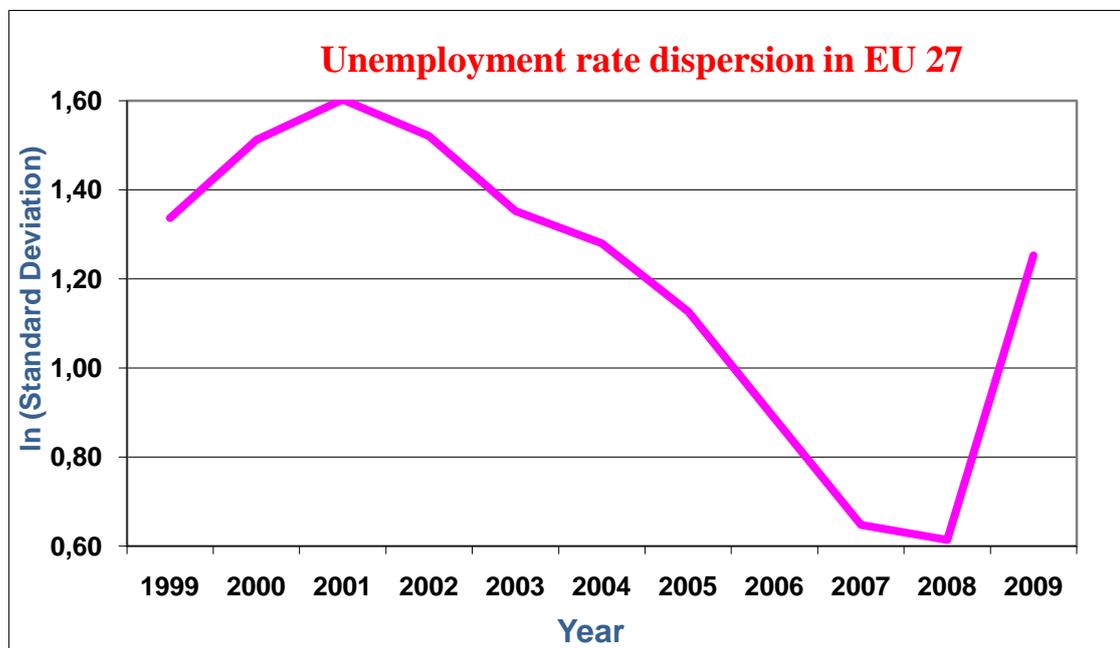
Previous figure 9 shows the dispersion of the unemployment in EU 27 where the years 1999-2009 are depicted on the horizontal axis and the log of the standard

deviation of unemployment are depicted on the vertical axis. It is obvious that the dispersion in unemployment between the countries have been decreasing from the 2001 to 2008. This means that there is sign of σ-convergence and the disparities between EU 27 countries decreasing. In the 2008 when the global economy crisis start, the unemployment rate start to increase and the disparities between EU countries also start to decrease because the developed countries were affected more than less developed countries.

4.2.2.2   V4 countries

In next figure the growth rate versus the unemployment rate is presented. The log of the unemployment for 1999 is depicted on the horizontal axis while the growth rate of unemployment between 1999-2009 is depicted on the vertical axis.

Figure 10: Growth rate vs. initial unemployment in V4 and EU27 average
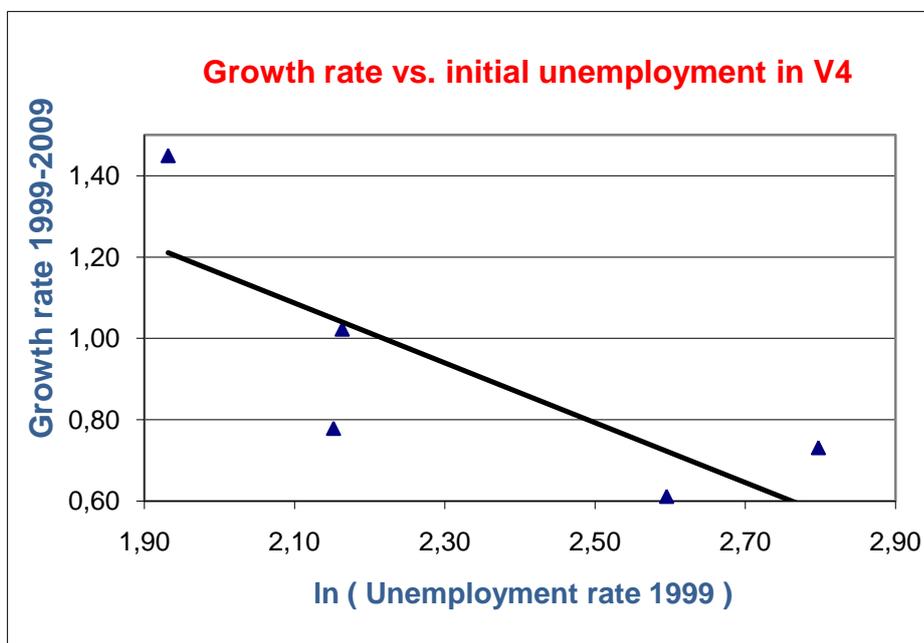
Source: own calculation

Table 8: Descriptive statistics of unemployment in V4, for σ-convergence

	t = 2009	t-T=1999
ln (mean)	2,22	2,43
ln (st.dev)	0,83	1,47

$$\text{sigma } t\text{-}T > \text{sigma } t$$
$$[\sigma t-(\sigma t\text{-}T)]= \textbf{- 0, 64}$$

The condition for σ -convergence has been met because it is negative (-0,64) and *sigma t-T > sigma t*. Meaning that the standard deviation for 1999 is bigger than the standard deviations for 2009. The σ –convergence is confirmed.

Figure 11: unemployment rate dispersion in V4
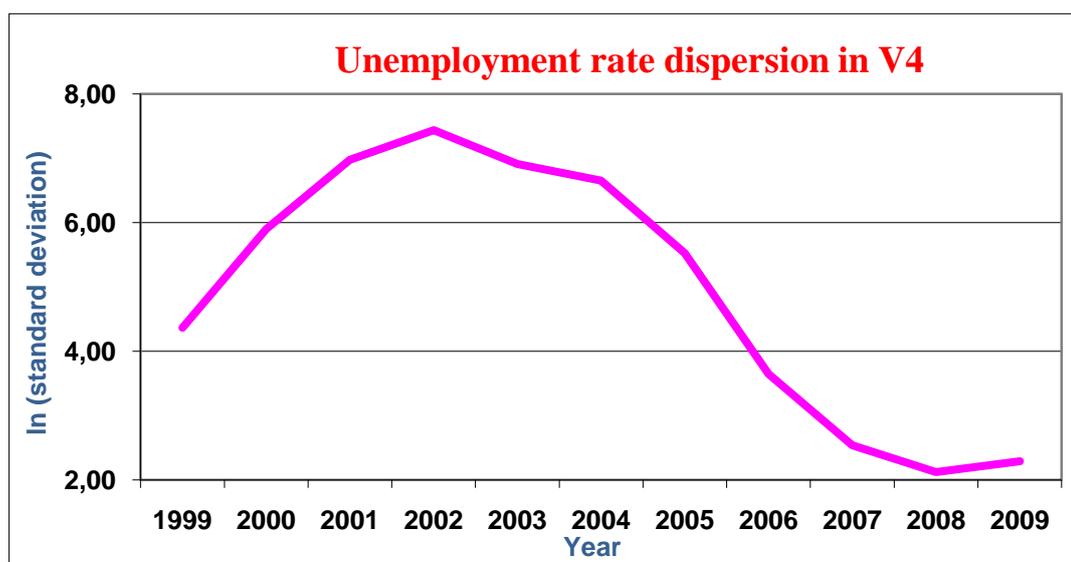
Figure 11 show the dispersion of the unemployment in V4 where the years 1999-2009 are depicted on the horizontal axis and the log of the standard deviation of unemployment are depicted on the vertical axis. From the 1999 till 2002 the disparities were increasing. The disparities start to decrease and after the accession of V4 group to EU disparities of unemployment between V4 countries start to decrease. It is obvious that the dispersion in unemployment between the countries have been decreasing from the 2002 to 2008. This means that there is sign of σ-convergence and the disparities

between EU 27 countries decreasing. In the 2008 when the global economy crisis start, the unemployment rate start to increase and the disparities between EU countries also start to increase.
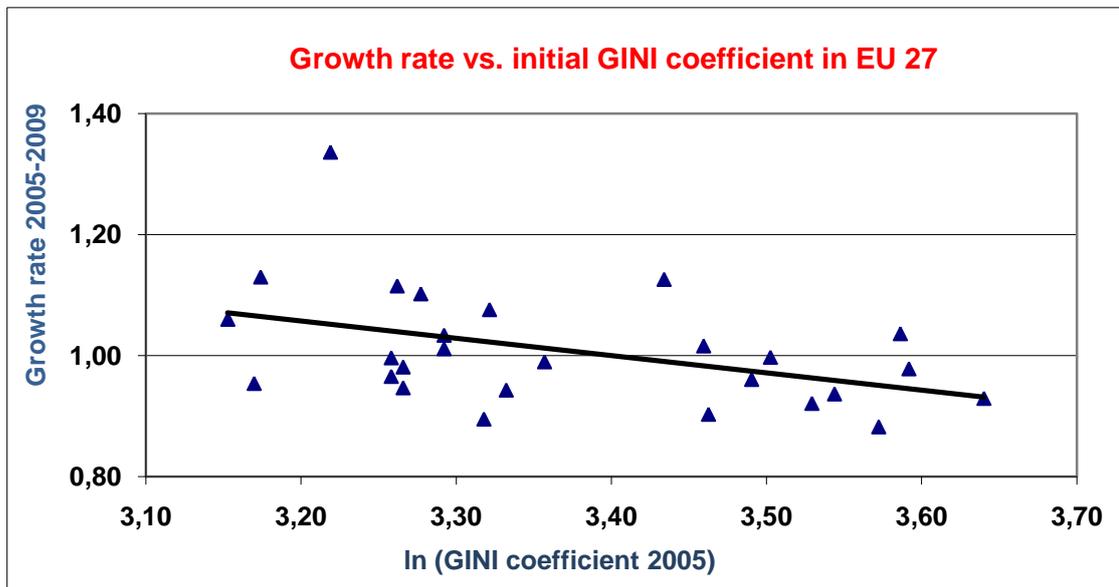
4.2.3   Convergence of GINI coefficient

4.2.3.1   EU27 countries

Europe   has always been egalitarian so from the beginning of the GINI coefficient history which was developed by the Italian statistician and sociologist Corrado Gini all of the countries in EU 27 were in the similar situation. Population was equally poor or rich. The EU trying to solve the problem of disparities by the various social programs and by minimizing the gap between the countries.

In next figure 12 the growth rate GINI coefficient versus the GINI coefficient is presented. The log of the GINI coefficient for 2005 is depicted on the horizontal axis while the growth rate of GINI coefficient between 2005-2009 is depicted on the vertical axis.

Figure 12: Growth rate vs. Initial GINI coefficient in EU27

Source: own calculation

Table 9: Descriptive statistics of GINI coefficient in EU27, for σ-convergence

	t = 2009	t-T=2005

|		
ln (mean)	3,38	3,38
ln (st.dev)	1,35	1,46

$$\text{sigma t-T} > \text{sigma t}$$
$$[\sigma t-(\sigma t-T)] = \textbf{- 0, 10}$$

The condition for σ -convergence has been met because it is negative (-0,10) and *sigma t-T >sigma t*. Meaning that the standard deviation for 2005 is bigger than the standard deviations for 2009. Sigma convergence is confirmed.

Next figure show the dispersion of the GINI coefficient in EU 27 where the years 2005-2009 are depicted on the horizontal axis and the log of the standard deviation of GINI are depicted on the vertical axis.

**Figure 13:** GINI coefficient dispersion in EU27
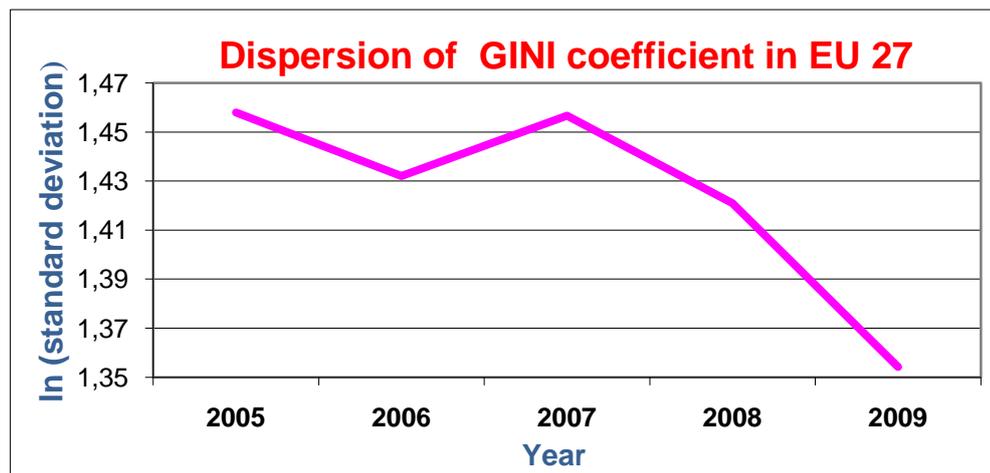
4.2.3.2   V4 countries

In next figure the growth rate versus the GINI of V4 is presented. The log of the GINI for 2005 is depicted on the horizontal axis while the growth rate of GINI between 2005-2009 is depicted on the vertical axis. Since the countries with initially lower GINI are growing faster than the richer ones, meaning that they tend to grow towards equal levels. Therefore β-convergence occurs.

Figure 14: Growth rate vs. Initial GINI coefficient in V4
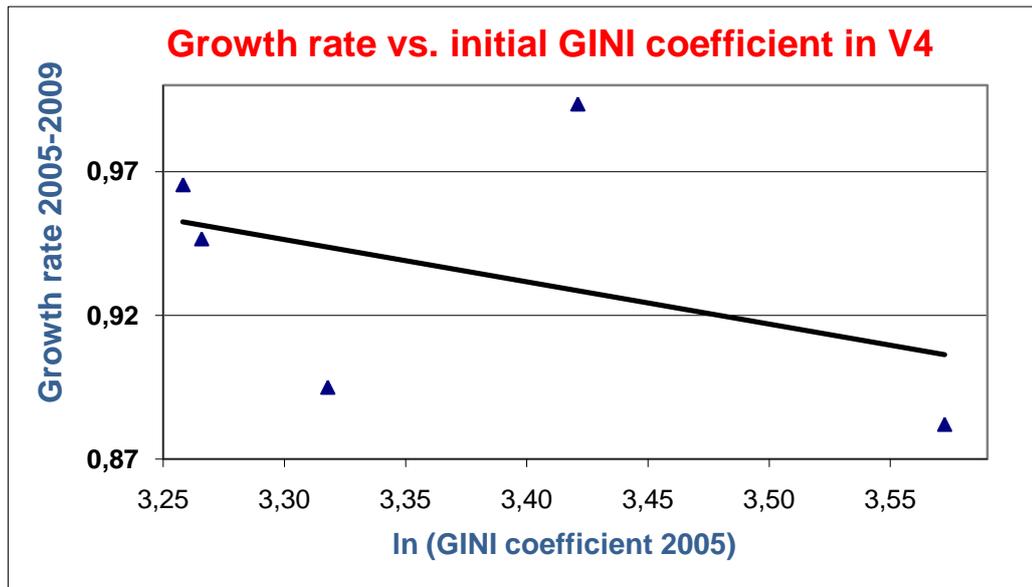
Source: own calculation

Table 10: Descriptive statistics of GINI coefficient in EU27, for σ-convergence

	t = 2009	t-T=1999
ln (mean)	3,28	3,36
ln (st.dev)	1,19	1,52

Source: own calculation

sigma t-T > sigma t

$[σt-(σt-T)]= - 0,33$

The condition for σ -convergence has been met because it is negative (-0,33) and *sigma t-T > sigma t*. Meaning that the standard deviation for 2005 is bigger than the standard deviations for 2009. Sigma convergence is confirmed.

In next figure we can see the dispersion of the GINI where the years 2005-2009 are depicted on the horizontal axis and the log of the standard deviation of GINI are depicted on the vertical axis.

Figure 15: Dispersion of GINI coefficient in V4

Dispersion of GINI coefficient in V4
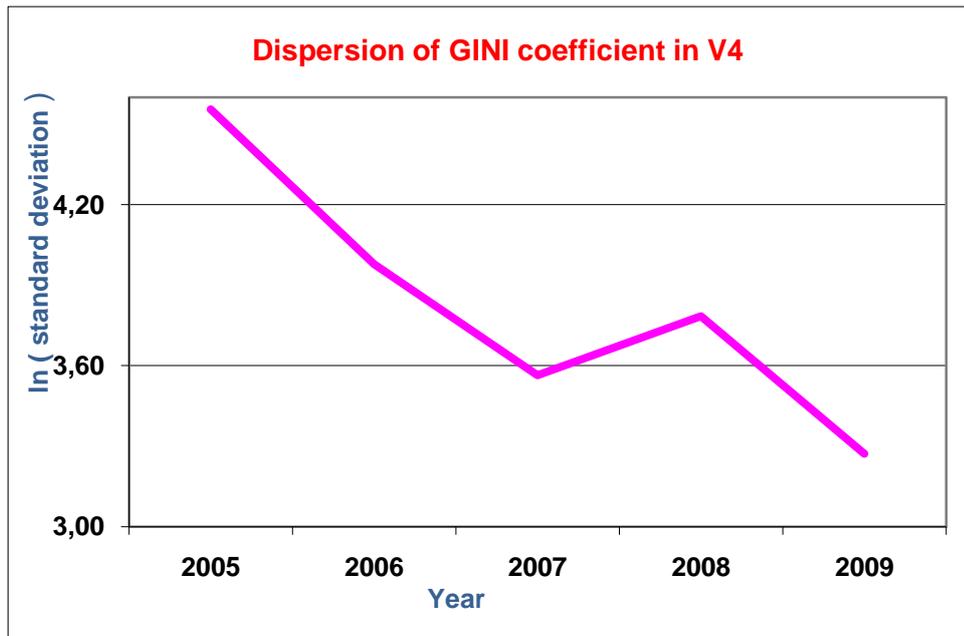
Source: own calculation

European societies are more based toward equity and egalitarianism, and often this goes at the expanse of efficient allocation of resources. This is in return translated in long term structural economic problems and unemployment. This is the price that EU society must pay for lower differences between different income groups and large scale income redistribution.

5 Conclusion

The objective of this thesis has been to analyze selected socio-economic aspects of regional development in EU and V4 countries from selected aspects like GDP/capita, unemployment rate and GINI coefficient. These indicators were chosen in order to create a clear view on the aspects of economic prosperity of the analyzed countries, prospects of growth and convergence in the EU economic context, as well as the level of inequality (if present) due to reforms undertaken by them in their path toward European Union. Further, beta and sigma - convergence has been tested in case of GDP for the countries analyzed and sigma convergence in case of unemployment and GINI index.

Analyzed years 1999 - 2009 have been for countries of Visegrad Group epoch - making period. Countries passed from the communist regime to a market economy and democracy. In 2004 they finally reached their long-term goal: EU accession. Historical facts are reflected in the overall development of the economy and it can be concluded that the economy of V4 countries has gone in the right direction. All countries have reached considerable growth rates due to tough market oriented reforms. Slovakia's GDP growth is most evident. While in 1999 the growth has stagnated, in 2002 has proceeded to 4,8% at close spacing with Hungary, which has reached 4,4% growth. In 2004, Slovakia has shown 5.2% growth, and legged behind Poland only about 0,1%. A number of economic factors have caused that since this year Slovakia has become a country where GDP growth accelerated substantially. Till 2007, Slovakia has achieved economic growth of 10,4% and become the most powerful economy between V4 countries and even more interesting area for foreign investors. Value of GDP of the other V4 countries was far behind the value of GDP of Slovakia. The second most powerful economy in 2007 has been Poland with 6,6% of GDP growth rate, closely followed by Czech Republic with 6,0% growth. Hungary had the lowest GDP growth significantly, only 1,2%, which lagged well behind the average of the EU, which in 2007 was 2,9%. In 2008 the situation has changed. The U.S. financial crisis had resulted in the slowdown of economic activity not only in the V4 countries but throughout the whole EU. On one hand, the growth of employment has had positive effect on economic development but on the other hand, this growth was decelerated by less dynamic exports.

With the exception of Czech Republic, V4 countries (like EU27 in general) face long-term problems with unemployment caused by still persistent structural economic problems, low competitiveness in the world market,   despite painful and relatively successful economic reforms. Poland is a very large country, the biggest one from V4 countries, therefore it is understandable that there are considerable territorial differences in the level of unemployment in different regions of Poland. The factors responsible for Poland´s unfavourable labour market trends could include also demographic conditions, weaknesses in education, inappropriate social protection policies, and structural changes in the labour market. Poland has relatively unfavourable business and investment climate, ineffective decentralization of labour market regulation, and high taxes on labour. Slovakia has been known as one of the countries with the highest unemployment rate in Visegrad Group as well as in Europe, which presented an important barrier for economic growth and competitiveness of economy. The trend of extremely high unemployment rate persisted until the beginning of 2004, when Slovakia entered the EU and creation of new jobs and also economic reforms contributed to decrease of unemployment. Many Slovaks have got the opportunity moving to work to countries such as Ireland or the United Kingdom that cancelled barriers to free movement of labour. From this year, jobless rate started decline because of opened borders in the EU on one hand, and also because of entering new car industry investors on Slovak market in 2006 and 2007 on other hand – PSA Peugeot Citroen in Trnava and Kia Motors in Žilina. In 2008 Slovakia reached the lowest unemployment figures in more than 10 years that was 9,5%, but since 2009 started to rise again till 11,9%, when many people lost their jobs caused by closing many factories or by production layoffs on the ground of economic crises. In Hungary, many skilled workers were discharged. The economy absorbed graduates that had no problems finding job. But this trend lasts until 2000, when the recession hit and the job marked has changed. Lower prestige universities suddenly lost their value and many graduates stayed long employed. Hungary with the Czech Republic on the other hand had the lowest unemployment rate from all Visegrad group countries during analyzed period. Hungary has ageing population problem, and the numbers of people of working age continues to decline.

However, the unemployment rate was relatively stable during the years 1997 – 2008, only in the 2009 the rate jumped at 10,8% caused a shortage of vacancies resulting from economic crises. The lowest unemployment was recorded in 2001, it was 5, 7%, and the highest in 1997, it was 9, 0%. The unemployment rate started to grow in Hungary in

2007 and 2008, it was 7, 4% and 7, 8% respectively whereby it passed the EU average. The Hungarian labour market have shown adverse effect in the recent past. Although employment did not grow, the number of unemployed also decreased. The main role in falling unemployment played a cutback of the length of the unemployment benefit and as a result was a decline in the number of persons authorized to unemployment benefits.

In terms of inequality, V4 countries show equal levels of GINI with more developed members of EU, Poland is an exception though, due to its size and diversity.

Based on the analysis of beta and sigma - convergence in case of GDP for the countries analyzed and sigma convergence in case of unemployment and GINI index (acquired from the application of logarithmic regression approach), V4 countries in the EU context tend to converge so that their convergence perspectives is positive. In general the EU countries with initially lower GDP are growing faster than the richer ones, meaning that they tend to grow towards equal levels. Therefore β-convergence occurs. However on the other hand, σ -convergence is not confirmed. A possible reason why it does not occur at the EU is that it is easier for smaller and less developed countries which are more similar to each other to converge than for developed countries which tend to be more dissimilar to each other. This reasoning is in line with Sala-i-Martin's (1996) convergence theory which states that less developed countries of EU are more likely to converge towards each other in an absolute sense than richer countries. An interesting phenomenon is the cyclical pattern in the analysis which shows that the dispersions increase when the economy is expanding while the dispersions decrease in recessions. All of the EU27 countries have similar problems in unemployment task which are very hard to solve in long run term. One of the main reasons of high unemployment in all EU member states is their structural problem in respective economies, consequently reflected in long-term unemployment. Therefore in this indicator EU countries have similar values and especially V4 countries even though they have made big progress in reforming their economies, convergence of EU unemployment figures show that they are not successful in resolving this difficult task. Europe has always shown strong egalitarian tendencies so from the aspect the GINI coefficient, all of the countries in EU 27 was in the similar terms. Population was equally poor or rich. The EU has been trying to solve the problem of disparities by the various social programs and by minimizing the gap between member countries. So from the aspect of unemployment and inequality EU countries (V4 included) show similar tendencies translated in convergence. Literally speaking, EU is united in their problem

rather than in prosperity or advantages. European societies are more biased toward equity and egalitarianism, and often this goes at the expense of efficient allocation of resources. This is in return translated in long term structural economic problems and unemployment. This is the price that EU society must pay for lower differences between different income groups and large scale income redistribution. Another apparent problem that EU countries face is decreasing competitiveness. Relatively higher labour costs, complicated regulation, protection of domestic labour market and long-term structural problems accompanied with aging population makes this problem even more pressing. In top of it EU governments do not allocate sufficient resources in the field of research and development. Lower investment in human capital are immediately reflected in lower competiveness, structural unemployment and leading Europe´s best and brightest to leave their domestic countries to other places like US, etc.

The path toward sustainable growth, development and convergence is tricky but not impossible. As some EU member countries has shown (like Finland, Ireland – despite the current crisis, or even V4 countries in some aspects) sound economic reforms, reduced regulation and increasing and efficient investment in human capital can make sure that the above is reachable. This is a task that policymakers should fulfil and are obliged to do it before their citizens, if they want to have a bright perspective for them and their countries. The alternative is gloomy and leads to permanent economic decline and other socially related problems. One might only hope that the later will not happen and people will note have to talk that it was once a prosperous place called Europe...

6 Resumé

Hospodársky rozvoj je v súčasnosti považovaný za veľmi dôležitý problém a pre všetky krajiny je prioritou zníženie HDP a zníženie nezamestnanosti. Najmä po prechode od centrálneho plánovania k trhovej ekonomike. Niektoré krajiny sú prirodzene v riešení tejto otázky úspešné viac a niektoré menej no vo všeobecnosti môžeme konštatovať že v posledných rokoch krajín strednej a východnej Európy dosiahli významný pokrok.

V novom tisícročí sa stávajú tieto krajiny jednými z najrýchlejšie rastúcich ekonomík na svete a keďže sú súčasťou Európskej únie a ďalších transatlantických štruktú, možno povedať že sa nachádzajú v relatívne stabilnom prostredí.

Kľúčovú úlohu v strednej Európe hra regiónu V4. Je to aliancia štyroch štátov strednej Európy - Česká republika, Maďarsko, Poľsko a Slovensko – založená za účelom spolupráce a presadzovania svojich európskej záujmov. Skupina vznikla na summite hláv štátov resp. vlád Československa, Maďarska a Poľska ktorý sa uskutočnil v maďarskom hrade mesta Višegrádu 15. februára 1991. Česká republika a Slovensko sa stali členmi po rozpade Československa v roku 1993. Všetci štyria členovia Vyšehradskej skupiny sa stali súčasťou Európskej únie 1. mája, 2004. Krajiny V4 môžu byť považovanľ za jeden regionálny klaster s mnohými podobnosťami a prepojeniami, napr. vo veľkej miere zahraničným obchodom. Taktiež majú mnoho spoločného v oblastiach kultúry, politiky, ekonomiky a sociálnej oblasti.

Krajiny V4 sú po Slovinsku najbohatšími postkomunistickýcmi krajinami v Európe, ale stále výrazne zaostávajú za západnými ekonomikami. Všetky majú relatívne rozvinuté trhové ekonomiky a taktiež viac či menej stabilný ekonomický rast.

Cieľom práce bolo analyzovať vybrané socio-ekonomické aspekty rozvoja V4 a EU27 ako celku pomocou štatistických údajov a informácií a poskytnúť tak verejnosti ako aj odborníkom informácie o danom regióne. Na základe analýzy a komparácie vybraných ukazovateľov, identifikovať významnosť jednotlivých makroekonomických aspektov a ich vzťah ku konvergencii vybraného regiónu. Pred vypracovaním diplomovej práce sme preštudovali danú problematiku z rozličných literatúr domácich ale aj zahraničných autorov, ktorí sa zaoberajú témou ekonomického rastu a taktiež regionálnou politikou. V práci sme sa pokúsili vyjadriť ekonomické postavenie jednotlivých krajín V4, ktoré sme navzájom porovnávali. Do deskriptívnej charakteristiky sme zahrnuli všeobecnú charakteristiku krajín V4 v kontexte s

vybranými ukazovateľmi. Ďalej sme sa zamerali na ekonomickú charakteristiku V4 a to konkrétne na vývoj niektorých socio-ekonomických ukazovateľov ako HDP na obyvateľa, mieri nezamestnanosti a GINI koeficientu. Jednotlivé ukazovatele sme sledovali v období 10 (resp. 5 rokov v prípade GINI indexu) a následne porovnali ich vývoj za sledované obdobie v rámci krajín. Pre dôkladnú analýzu sme si zvolili exaktnú metódu beta konvergencie v rámci krajín EU27 a V4 za ukazovateľ HDP a taktiež aj sigma konvergenciu za ukazovateľ mieri nezamestnanosti , GINI indexu a HDP.

Za účelom preskúmania konvergencie medzi krajinami V4 a konvergencie medzi EU 27 bola analýza rozdelená do dvoch častí.

V prvej časti sme posudzovali, či došlo k nejakému zblíženie medzi sledovaných krajín v rokoch 1999-2009. Táto analýza sa vykonáva na úrovni krajiny. Boli použité dva druhy modelov teórie konvergencie a to σ-konvergencia a absolútna β-konvergencia(Sala-i-Martin,1996).

V druhej časti sme sledovali rast ukazovateľov zamestnanosti, HDP a index GINI. Tieto ukazovatele sú vybrané preto, že celkom dobre reprezentujú rozvoj krajín EÚ.

Existujú dva spôsoby merania konvergencie, β-konvergencia a σ-konvergencie. Absolútna β-konvergencie nastane, keď β je negatívna. To znamená, že chudobné krajiny majú tendenciu rásť rýchlejšie ako krajiny bohaté. σ-konvergencie nastane v prípade, že rozptyl ekonomík skutočný úroveň HDP na obyvateľa majú tendenciu k poklesu v priebehu času. Je dôležité si uvedomiť, že existencia β-konvergencie je nevyhnutnou podmienkou pre σ-konvergencie. V prípade podobných ekonomík, je pravdepodobnejší výskyt absolútnej β-konvergencie, rovnako ako σ-konvergencie. To je dôvod, prečo táto štúdia bude len odhad absolútnej β-konvergencie(Sala-i-Martin,1996).

Analyzované roky 1999 - 2009 boli pre krajiny Visegrádskej skupiny epochou. Krajina prešla od komunistického režimu k trhovej ekonomike a demokracii. V roku 2004 krajiny V4 konečne dosiahli ich dlhodobý cieľ: vstup do EÚ. Historické fakty sa odrážajú v celkovom vývoji ekonomiky, a tu možno urobiť záver, že ekonomika krajín V4 išla správnym smerom. Všetky krajiny, dosiahli značnú miery rastu v dôsledku ťažkých trhovo orientovaných reforiem. Rast HDP na Slovensku je najviac viditeľný. Kým v roku 1999 rast stagnuje, v roku 2002 pokračoval na 4,8% v tesnej vzdialenosti s Maďarskom, ktorá dosiahla 4,4% rastu. V roku 2004 sa ukázalo, Slovensko 5,2% rast, tesne za Poľskom len asi 0,1%. Rad ekonomických faktorov spôsobili, že od tohto roku sa Slovensko stalo krajinou, kde rast HDP podstatne zrýchlil. Do roku 2007, Slovensko

dosiahlo hospodárskeho rastu vo výške 10,4% a stal sa najsilnejšou ekonomikou medzi krajinami V4 a ešte zaujímavejšou oblasť pre zahraničných investorov. Hodnota HDP ostatných krajín V4 bol ďaleko za hodnotu HDP na Slovensko. Druhá najsilnejšia ekonomika v roku 2007 bolo Poľsko s 6,6% tempom rastu HDP, tesne nasledované Českou Republikou s 6,0% rastom. Maďarsko s výrazne najnižší rast HDP, iba 1,2%, čo znamenalo zaostávanie aj za priemerom EÚ, ktorý v roku 2007 bola 2,9%. V roku 2008 sa zmenila situácia. Americká finančná kríza mala za následok spomalenie ekonomickej aktivity nielen v krajinách V4, ale v celej EÚ. Na jednej strane rast zamestnanosti má pozitívny vplyv na hospodársky rozvoj, ale na druhej strane, tento rast spomalil vývoz. S výnimkou ČR, krajiny V4 (aj EU27 všeobecne) čelili dlhodobým problémom s nezamestnanosťou spôsobenou stále pretrvávajúcimi štrukturálno-ekonomickými problémy, nízku konkurencieschopnosť na svetovom trhu, a to aj napriek bolestivým a pomerne úspešným ekonomickým reformám. Poľsko je veľmi veľká krajina, najväčšia z krajín V4, a preto je pochopiteľné, že existujú značné územné rozdiely v úrovni nezamestnanosti v jednotlivých regiónoch Poľska. Faktory zodpovedné za nepriaznivé trendy na trhu práce v Poľsku by mohli zahŕňať aj demografické podmienky, nedostatky v oblasti vzdelávania, nevhodná politika sociálnej ochrany, a štrukturálne zmeny na trhu práce. Poľsko má relatívne nepriaznivé podnikateľské a investičné prostredie, neefektívnu decentralizáciu a regulácie na trhu práce a vysoké daňové zaťaženie práce. Slovensko bolo známe ako jedna z krajín s najvyššou mierou nezamestnanosti vo višegrádskej skupiny, rovnako ako v Európe, ktorá predstavuje významnú prekážku pre hospodársky rast a konkurencieschopnosť ekonomiky. Trend extrémne vysokej miery nezamestnanosti pretrvávala až do začiatku roku 2004, keď Slovensko vstúpilo do EÚ a vytváranie nových pracovných miest a tiež ekonomické reformy prispeli k zníženiu nezamestnanosti. Mnohí Slováci dostali možnosť pohybu za prácou do krajín ako Írsko alebo Spojené kráľovstvo, nakoľko boli zrušené prekážky voľného pohybu pracovných síl. Od tohto roku miera nezamestnanosti začala klesať, v dôsledku otvorenia hraníc v EÚ na jednej strane, a vstupom nových investorov do automobilového priemyslu na slovenský trh v roku 2006 a 2007 na strane druhej - PSA Peugeot Citroen v Trnave a Kia Motors v Žiline. V roku 2008 Slovensko dosiahlo najnižšiu nezamestnanosť za posledných 10 rokov, ktorá bola 9,5%, ale od roku 2009 sa znovu začal zvyšovať až na 11,9% kedy veľa ľudí prišlo o prácu čo bolo spôsobené zatvorením mnohých tovární a firiem v dôvodu hospodárskej krízy. V Maďarsku, bol prepustených veľa kvalifikovaných pracovníkov. Ekonomika však vstrebáva absolventov, ktorý nemali

žiadne problémy s hľadaním zamestnania. Ale tento trend trvá len do roku 2000, kedy nastáva recesia a dochádza k výrazným zmenám na trhu práce. Prestíž vysokých škôl naraz stratil svoju hodnotu a veľa absolventov zostával dlhodobo zamestnaný. Napriek tomu v Maďarsko a Českj republike bola najnižšia miera nezamestnanosti zo všetkých skupín krajín Višegrádu v priebehu analyzovaného obdobia. Maďarsko malo problém starnutia populácie, a počet ľudí v produktívnom veku neustále klesal. Avšak, miera nezamestnanosti bola relatívne stabilná v priebehu rokov 1997 - 2008, iba v roku 2009 sadzba vyskočila na 10,8% spôsobená nedostatkom pracovných miest v dôsledku ekonomickej krízy. Najnižšia miera nezamestnanosti bola zaznamenaná v roku 2001, to bolo 5, 7%, a najvyššia v roku 1997, to bolo 9, 0%. Miera nezamestnanosti začala rásť v Maďarsku v roku 2007 a 2008, to bolo 7, 4% a 7, respektíve 8%. Maďarský trh práce ukázal negatívny vplyv v nedávnej minulosti. Hoci zamestnanosť nevzrástla, počet nezamestnaných sa znížil. Hlavnú úlohu v poklese nezamestnanosti hrali obmedzenia dĺžky nezamestnanosti v dôsledku toho došlo k poklesu počtu osôb oprávnených k dávkam v nezamestnanosti. Pokiaľ ide o nerovnosť, krajín V4 majú približne rovnakú úroveň Gini v porovnaní s vyspelejšími členmi EÚ, v Poľsku je však výnimka, vzhľadom k veľkosti a rozmanitosti Poľska.

Na základe analýzy beta a sigma – konvergencie vybraných ukazovateľov (získané z uplatňovania logaritmické regresie), krajín V4 v rámci EÚ majú tendenciu konvergovať, tj. konvergencie je pozitívna. Vo všeobecnosti v krajinách EÚ so spočiatku nižším HDP rastie rýchlejšie ako u bohatších krajín, čo znamená, že majú tendenciu rásť smerom k danej úrovni. To znamená že β-konvergencie nastane. Avšak na druhej strane, σ-konvergencia nie je potvrdené. Jedným z možných dôvodov môže byť že zbližovanie je jednoduchšie pre menšie a menej rozvinuté krajiny, ktoré sa navzájnom viac podobajú, ako pre rozvinuté krajiny, ktoré majú tendenciu byť viac odlišné. Táto úvaha je v súlade s Sala-i-Martin (1996) konvergenčnou teória, ktorá hovorí, že menej rozvinuté krajiny EÚ, majú väčšiu tendenciu ku konvergencii ako bohatšie krajiny. Zaujímavým fenoménom je cyklický model v analýze, ktorá ukazuje ku že zvýšeniu disperzie dochádza v období expanzie ekonomiky a opačne v období recesie dochádza k zníženie disperzie. Všetka krajin EÚ-27 majú podobné problémy v oblasti nezamestnanosti, ktoré sú veľmi ťažko riešiteľné v dlhodobom horizonte. Jedným z hlavných dôvodov vysokej nezamestnanosti vo všetkých členských štátoch EÚ sú štrukturálne problémy v príslušných ekonomikách, čo sa následne odráža v dlhodobej nezamestnanosti. Preto v

tomto ukazovateli krajiny EÚ majú podobné hodnoty, a to predovšetkým krajín V4, aj keď práve oni robia veľké pokroky v reformách svojich ekonomík. Európa vždy prejavovala silné sklony k rovnostárstvu, takže z hľadiska GINI koeficientu, všetky krajiny v EÚ 27 boli v podobných podmienok. Obyvateľstvo bolo rovnako chudobní alebo bohaté. EÚ sa snaží vyriešiť problém rozdielov prostredníctvom rôznych sociálnych programov a snaží sa minimalizovať rozdiely medzi členskými krajinami. Takže z pohľadu krajín EÚ nezamestnanosť a GINI (vrátane V4) vykazujú podobné tendencie v konvergencii. Doslovne povedané, EÚ je jednotná viac v problémoch než v prosperite. Európske spoločnosti sú viac zamerané na prospech vlastného imania a rovnostárstva, čo často ide na úkor efektívnej alokácii zdrojov. Rovnako to ide na úkor dlhodobých štrukturálnych a ekonomických problémov a samozrejme nezamestnanosti. To je cena, ktorú európska spoločnosť musí zaplatiť za nižšie rozdiely medzi rôznymi príjmovými skupinami a rozsiahle prerozdeľovanie príjmov. Ďalším zrejmým problémom je že EU čelí zvyšujúcej sa konkurencii. Relatívne vyššie náklady na pracovnú silu, zložitá regulácia, ochrana domáceho trhu práce a dlhodobé štrukturálne problémy, sprevádzané starnutím obyvateľstva robia tento problém ešte naliehavejším. Vlády členských štátov EU nevyčleňujú dostatočné zdroje na oblasť výskumu a vývoja. Nižšie investície do ľudského kapitálu sa okamžite prejavia v nižšej konkurencieschopnosti, v štrukturálnej nezamestnanosti a popredný vzdelaný Európania opúšťajú svoje krajiny a odchádzajú do iných častí sveta napr. USA atď. Cesta smerom k udržateľnému rastu, rozvoju a konvergencii je ťažké, ale nie nemožné. Niektoré členské krajiny EÚ ukázali, (podobne ako Fínsko, Írsko - aj cez súčasnú krízu, alebo dokonca krajín V4 v niektorých aspektoch) že prostredníctvom ekonomických reforiem, zníženou reguláciou a zvyšovaním investície do ľudského kapitálu môžu efektívne čeliť problémom. To je úloha, ktorú by zákonodarci mali pre svojich občanov plniť, ak pre nich a ich krajín chcú jasnú perspektívu. Ak tak robiť nebudú bude to viesť k trvalému hospodárskemu úpadku a iným súvisiacim sociálnym problém. Môžeme len dúfať, že sa tak nestane a ľudia nebudú už len spomínať a hovoriť, že Európa bolo kedysi prosperujúce miesto...

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