

Andrea Elekes

# *Cohesion and/or Growth?*

## *Regional Dimensions of Convergence and Growth in Hungary*

---

**SUMMARY:** Convergence and territorially balanced economic growth require faster economic growth in weaker regions. It is difficult to decide what measures would strengthen the growth capacity of regions most. Following a brief review of growth theories and the growth and catch-up performance of the Hungarian economy, the study focuses on the differences in development across regions in Hungary. Both the analysis of available statistical data and the calculations in connection with the catch-up rate show that the Hungarian regional development is strongly differentiated, and the so-called centre–periphery relationship can clearly be identified. Growth factors (e.g. human capital and R&D investment, innovation) should be enhanced simultaneously. Cohesion policy can complement and support growth objectives in many areas. Moreover, through the coordination of the innovation and cohesion policies even the trade-off problem between efficiency and convergence may be reduced.

**KEYWORDS:** regional convergence, growth, cohesion, crisis

**JEL-CODES:** F43, R11, R12

---

Convergence and territorially balanced economic growth require a faster increase in income, employment and economy in weaker regions than in stronger ones. However, it is rather difficult to decide what measures would strengthen the growth capacity of regions most.

This study is, therefore, essentially searching for answers for the following questions. What factors determine regional growth? What picture does Hungary and its regions show in this field? What effect did the crisis have on the performance of regions, and how does it affect future prospects? In order to answer these questions, the first part of this study attempts to identify the factors that determine regional growth by providing a brief overview of the main growth theories. The growth and convergence performance of the Hungarian economy

will be discussed next. The third part focuses on the differences in domestic regional development, primarily through an analysis of the statistical data regarding the factors identified in the theoretical section.

Following the mapping of domestic regional development, the question arises what role cohesion policy may play in convergence and in a more balanced development. Namely, cohesion policy may complement and support individual Member States' growth (and employment) objectives in a number of areas, as one of its most important targets is real convergence, i.e. making the less developed regions catch up. However, much depends on the efficient utilisation of resources, and this efficiency raises a fundamental question: supporting excellence (the best developing regions) or balanced development results in the highest efficiency?

## FACTORS THAT DETERMINE REGIONAL GROWTH

Identifying the factors that determine growth is difficult because there is no exclusively accepted growth theory (the validity of one theory does not necessarily mean that another one is wrong). In the course of time, theoretical and empirical researches identified a number of growth factors (Erdős, 2003). Their review and systematisation alone constitute a serious task; therefore, this article can only focus on the presentation of the main features of the most important theoretical schools (see Table 1).

In neoclassical growth models, growth is attributable to supply side factors (territorially identical, exogenous technology as well as capital and labour). In view of the assumption regarding the declining return on capital, the productivity growth of regions with relatively limited capital supply is faster, while that of regions having a high capital/labour ratio is slower (the growth stimulating effect of capital accumulation is limited). Therefore, if there is an equilibrium, the growth rate of productivity will be balanced across regions, and will equal the exogenous rate of technological development.

However, if technological change is at least partly determined by an endogenous process (e.g. it depends on levels of knowledge), then the ability of a region to benefit from technological change through diffusion may be much slower if there are interregional differences in knowledge stocks (Harris, 2008). This has led to the development of *technology-gap models* where regions that lag furthest behind the technology level of the most advanced regions are presumed to experience the fastest rate of catch-up and thus the fastest rate of growth in total factor productivity (TFP). These models suggest that *differences in TFP are likely to be the main driver of persistent regional growth disparities*.

According to the  $\beta$ -convergence<sup>1</sup> theory (Barro – Sala-i-Martin, 1995), which rests on neoclassical foundations, *all regions converge (or do not converge) to one single equilibrium value*. Enhanced models (convergence clubs, conditional convergence, application of time series etc.) attempt to handle the problems of the basic model. The latest neoclassical models already strive to take into account the differences across territories as well, and thus the clubs or groups of regions may head towards

Table 1

### FACTORS THAT DETERMINE REGIONAL GROWTH

Features, model	Competition	Scale yield	Convergence/growth	Source of growth
Neoclassical	Perfect	Permanent	Only equilibrium	TFP*
Kaldor	Imperfect	Increasing	Different growth paths	Exogenous increase in demand
New neoclassical	Perfect	Permanent	More equilibrium value (clubs)	TFP
Endogenous growth	Monopolistic	Increasing	Different growth paths	TFP (intensity growth of physical capital, human capital accumulation and increase in productivity)
New economic geography	Monopolistic	Increasing	Different growth rates, different growth paths; Permanent centre-periphery disparity in regional development	Export base, agglomeration effects

Note: TFP: total factor productivity

Source: own editing

different growth rates. However, the  $\beta$ -convergence models only refer to the fact of catching up (or lagging behind), without explaining the territorial differences in development.

*Kaldor's regional growth models*, elaborated in the 1970s, already assume an increasing scale yield, with a feedback between output and productivity growth (Verdoorn relation<sup>2</sup>). The *main driving force of regional output is the exogenous demand for the export base* (the competitiveness of differentiated products and services based on quality), and individual regions may follow entirely different growth paths.

*According to the endogenous growth theory*, technological development is not exogenous, and increasing scale yield has to be assumed because of the externalities (Romer, 1986; Lucas, 1988; Aghion – Howitt, 1998 etc.). Due to the increasing scale yield, the per capita output growth is no longer limited, and the regional or national convergence of per capita incomes is not inevitable either. The second wave of endogenous growth models (Romer, 1990; Grossman – Helpman, 1991 and Aghion – Howitt, 1998 etc.) already takes account of the microeconomic environment of corporations. The accumulation of knowledge through research and development is a costly process, which only pays off if corporations have market power. These models; therefore, break away from assuming perfect competition, and assume monopolistic competition.<sup>3</sup>

Total factor productivity captures not only the technical efficiency level of the economy, but also its allocation efficiency (i.e. the efficiency of the distribution of resources available for the country across various economic activities) (for details see Boulhol et al., 2008). *Therefore, the increase in per capita output is fundamentally determined by three factors: the increase in physical capital intensity, human capital accumulation and productivity growth.* This is the standard growth accounting (based on

growth functions). However, caution is warranted by the fact that the growth in accumulation and productivity is endogenous. *Rodrik* (2001) mentions the following among the secondary factors that determine growth: integration and openness (trade), culture and institutions.

Following the publishing of the new trade theory (Krugman, 1980; Krugman – Venables, 1990) and the *new economic geography* models (Krugman, 1991; Krugman – Venables, 1995; Baldwin et al., 2003), the determining role of the territorial dimension in economic development gained increasing recognition.<sup>4</sup> Although the primary focus of the theory of economic geography is the territorial distribution of production, there are growth aspects as well.

The new trade theory postulates monopolistic competition, increasing scale yield and differentiated products. In the interest of minimising transportation costs and easier access to markets, corporations settle in the vicinity of the large consumer markets. At the same time, this also means that the given region exports products for which there is relatively high domestic demand (this is the so-called domestic market effect). It is worth mentioning that in this case increasing scale yield is not necessarily technology based. Concentration is much more driven by territorial externalities.

*New economic geography* extends the new trade theory, and *examines the reasons for the geographical concentration of new industries.* While the size of the domestic market is an exogenous factor in the new trade theory (fundamentally because it is assumed that labour is not mobile), in the new economic geography approach it is already endogenous, mainly because of the assumption regarding the mobility of labour, and partly because it allows greater mobility for those companies as well that have significant interim demand. As by now not only capital, but labour has also become mobile, redeployment of economic

activities among regions may be even more significant (Harris, 2008).

The mobility of labour and capital both contribute to the increasing of the effect of the domestic market. The size of the domestic market is further increased by the consumption of the labour flowing into the region as well as by the capital mobility within the industry through the strong input-output relations (strong indirect demand). The higher the ratio of interim products in the final product is, the more important the demand and cost relations are, and the greater the advantage stemming from the geographical/territorial concentration is. *Accordingly, the new economic geography approach considers trade and agglomeration forces as the determining factors of regional growth.*

However, there are centrifugal forces as well that work against agglomeration (e.g. housing costs). Therefore, depending on the centripetal and centrifugal forces, the new economic geography models may have innumerable equilibrium results. Some models forecast permanent centre-periphery division (regarding the level of output). Other models result in different growth rates and growth paths. Furthermore, there are models which suggest that (as a result of the prevailing of centrifugal forces) initial division is followed by convergence.

## PERFORMANCE OF THE HUNGARIAN ECONOMY – GROWTH, CONVERGENCE

Following the recession typical of the early 1990s (and closely related to the transformation), economy had become stable, which was followed by notable growth preceding EU accession. Growth was primarily driven by trade openness, foreign direct investment (increase in capital assets) and an improvement in institutional conditions (EC, 2009a). These factors contributed to an increase in productiv-

ity and – through that – an increase in living standards and domestic demand.

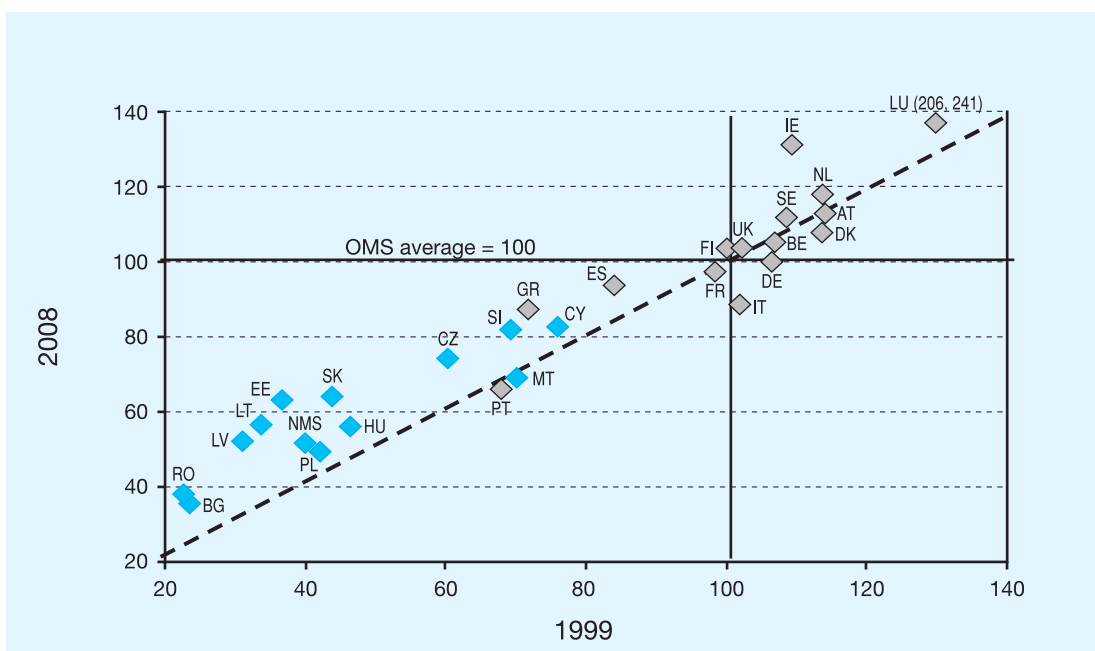
As a result of the growth that exceeded the EU average, the lag compared to old Member States declined, and catching up began. Per capita GDP in 1999 amounted to 50 per cent of the average of old Member States, but increased to around 60 per cent by 2008.

*Chart 1* also shows that countries with a lower per capita GDP grew faster, and catching up started. The inverse relation between growth and income level is actually the aforementioned  $\beta$ -convergence. As inflation rate, interest rates and government debt also converged to the EU average, this meant not only real but nominal convergence as well. However, as a result of the financial crisis, this financial stability ceased to exist as of 2007, and has probably contributed to the increase in the income gap.

It is a fact that in the period under review the convergence of Hungary can be detected. However, a more thorough examination of the data leads to interesting findings. It can be observed that while output growth continued to accelerate in the other new member states from the year of accession, the process of convergence in Hungary came to a sudden halt right after the accession. *Based on calculations regarding the catch-up rate<sup>5</sup>, Halmai (2009) comes to the conclusion that “in Hungary’s case, as a result of the macroeconomic (especially equilibrium) difficulties as well as the coerced stabilization program launched in the autumn of 2006, there has essentially been no catch-up in GDP per capita since accession.”* The catch-up rate has been positive since the accession, i.e. convergence can be exhibited for the period under review as a whole only because the outstandingly high growth rate in the pre-accession period resulted in an extremely favourable catch-up rate.

It is also of interest to know whether absolute inequalities among countries are being

PER CAPITA GDP



Source: EC (2009a)

reduced over time. Although  $\beta$ -convergence is necessary in order for absolute income differences to disappear, it may not be sufficient. If the income difference is wide and the poorer country is growing only moderately faster than the richer one, the absolute income difference may actually increase (EC, 2009a). The speed of convergence compared to the equilibrium growth rate, i.e. whether the disparity is being reduced over time, is measured by the so-called *sigma-convergence*<sup>6</sup>. According to the Commission study (EC, 2009a), the new Member States with low per capita GDP are not only catching up with their wealthier peers in relative terms, but they are doing so at a fast enough pace for absolute income inequalities to diminish over time.

Although income disparities across countries have declined, the differences within countries have grown markedly. This is in line with the so-called Williamson-curve hypothesis (Williamson, 1965), according to which the relationship

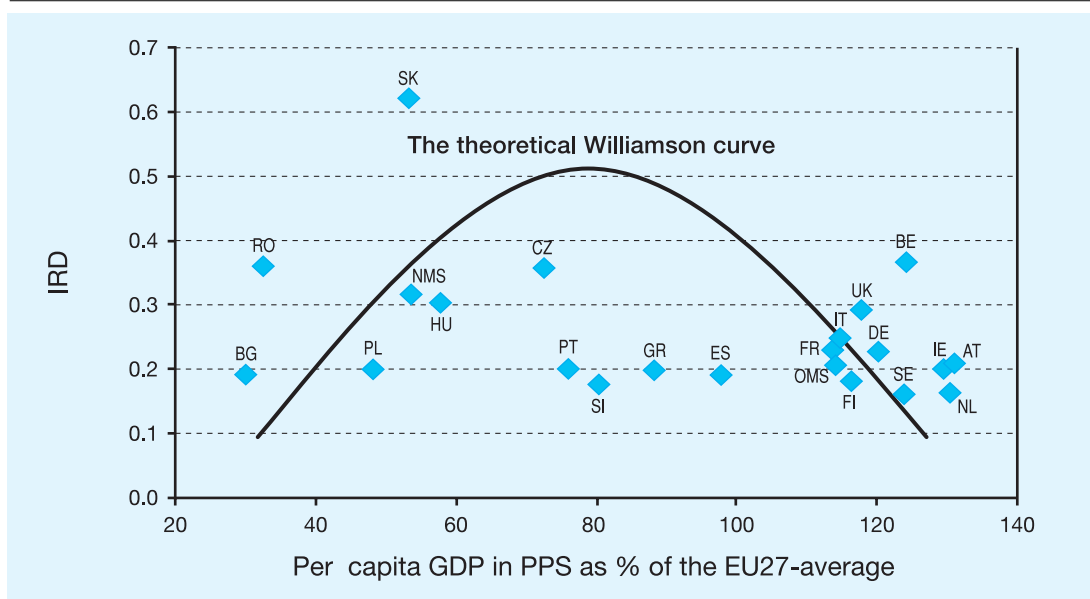
between a country's economic development and within-country regional disparities follows a reverse-inverted U-shaped curve.<sup>7</sup> The hypothesis is based on the argument that, in the early stages of development, capital and skilled labour tend to concentrate in a few regions which drive the country's economic growth. In a certain period of development, as a result of knowledge spillovers, financial transfers and centrifugal agglomeration forces, a more balanced income situation may evolve.

Chart 2 depicts the weighted standard deviations of regional (NUTS level 2) GDP per capita levels divided by the countries' GDP per capita levels, i.e. the regional disparities within countries.

It is clearly visible in Chart 2 that Hungary is in the rising section of the curve, i.e. growth within the country is not balanced, and regional disparities are high. If the theory stands the test, regional disparities are expected to continue to increase, as a turn in the trend is only expected

Chart 2

**REGIONAL DISPARITIES AND PER CAPITA GDP, 1995–2005**



Note:  $IRD = \frac{[\sum((GDP_{pc\_r} - GDP_{pc})^2)/N]^{1/2}}{GDP_{pc}}$ , where IRD is the index of regional disparity, N is the number of the regions in the country, GDP<sub>pc</sub> is the national per capita GDP, and GDP<sub>pc\_r</sub> is the per capita GDP in region r. OMS: EU 15, except DK, LU. NMS: SK, RO, CZ, HU, BG, PL, SI.

Source: Eurostat Commission services; EC, 2009a

at around 80 per cent (instead of the current 60 per cent) of the average per capita GDP of the EU 27. Accordingly, economic convergence is driven by the growth of a few regions.

**REGIONAL DISPARITIES IN HUNGARY: CENTRE–PERIPHERY**

In terms of per capita income growth, the region of Central Hungary, which also includes the capital, shows a systematically better result than other regions (see Table 2). Central and West Transdanubia are somewhere in the middle, but the performance of the rest of the country is well below that of the leaders.

It is clearly visible from the figures in Table 2 as well that the “growth bonus” of the region that includes the capital is outstandingly high. [For that matter, this phenomenon is generally typical of the Central and East European new

Member States of the EU, and, as it is established in a Commission document (EC, 2009a), the growth bonus of the regions in question is much higher here than in the old Member States.] The data in Table 2 support *Williamson’s* (1965) hypothesis empirically as well. The hypothesis suggests that at the beginning of the convergence process economic growth is concentrated in the regions that comprise big city agglomerations.

According to *Baldwin* and *Martin* (2004), agglomeration enhances growth, but other authors have also emphasised the close relationship between the two processes. *Martin* and *Ottaviano* (1999), for example, described the correlation between agglomeration and growth as a mutually reinforcing process, while *Fujita* and *Thisse* (2002) characterised it as a “hand-in-hand” process.

According to *Williamson* (1965), the significance of agglomeration is highest in the early

Table 2

**PER CAPITA GROSS DOMESTIC PRODUCT AS A PERCENTAGE OF THE NATIONAL AVERAGE**

	1997	2004	2007
Central Hungary	148.7 (1)	159.5 (1)	164.4 (1)
Central Transdanubia	96.4 (3)	94.7 (3)	92.9 (3)
West Transdanubia	105.4 (2)	104.0 (2)	98.1 (2)
South Transdanubia	78.0 (5)	71.0 (4)	68.2 (4)
North Hungary	67.2 (7)	66.0 (6)	64.1 (6)
North Great Plain	69.9 (6)	65.3 (7)	63.0 (7)
South Great Plain	79.1 (4)	69.5 (5)	66.8 (5)

Note: ranking in brackets.

Source: Own calculations based on HCSO data

Table 3

**PERFORMANCE VALUE OF THE INVESTMENT OF ECONOMIC ORGANISATIONS**

(as a percentage of the total)

As a percentage of the total	2005	2007	2009
Central Hungary	52 (1)	53 (1)	55 (1)
Central Transdanubia	11 (2)	14 (2)	10 (2)
West Transdanubia	8 (4)	8 (3)	8 (3)
South Transdanubia	5 (7)	5 (7)	7 (5)
North Hungary	8 (5)	6 (6)	6 (6)
North Great Plain	10 (3)	8 (4)	8 (4)
South Great Plain	6 (6)	6 (5)	6 (7)

Note: ranking in brackets.

Source: Own calculations based on HCSO data

Table 4

**HIGH-TECH EMPLOYMENT**

	1999	2004	2008
Central Hungary	6.02	7.17	7.48* (1)
Central Transdanubia	7.49	7.05	6.65 (2)
West Transdanubia	4.40	6.01	6.01* (4)
South Transdanubia	3.53	4.15	6.28 (3)
North Hungary	3.45	5.82	4.86 (5)
North Great Plain	2.69	3.83	3.60 (6)
South Great Plain	2.58	2.48	2.89 (7)

Note: ranking in brackets.

Source: Own calculations based on HCSO data

stage of development. When transport and communications infrastructure is still sparse, and capital market opportunities are limited, efficiency may be significantly increased by the territorial concentration of production. This territorial concentration is clearly discernible in Hungary. On the basis of the figures in *Table 3*, it is distinctly visible that more than 50 per cent of the investment of economic organisations is concentrated in the Central Hungary region, which includes the capital as well. The other six regions share the remaining less than 50 per cent in a more or less balanced manner.

According to the neoclassical theories, the higher TFP value in the leading regions is the result of the greater stock of knowledge and human capital. In less developed regions, technological development usually means the feed-through of existing technology, rather than the creation of new products and processes.

*Knowledge and learning* may fundamentally determine the growth prospects of a region. To be able to compete and grow in new markets as well, companies have to understand, share and include new knowledge in their own activity. Preliminary knowledge enables a company to recognise the value of information and to adequately utilise and apply it. (Together, these abilities are called the absorption capacity of the company.) For example, *Verspagen – Schoenmakers* (2004) came to the conclusion that the absorption of new knowledge is much better in regions where the level of productivity is higher and the knowledge stock is richer from the outset. Without adequate absorption capacity, companies are unable to make use of the advantages stemming from favourable pass-through effects, agglomeration or technology transfer. Moreover, regions are not equally able to absorb available knowledge and to integrate knowledge into (endogenous) economic growth. According to the OECD (2003), it is possible to prove that expenditures spent on

R&D and human capital<sup>8</sup> more strongly influence the developments in per capita GDP in territories that can be characterised with a higher urban concentration.

Based on *Table 4*, a strong positive relationship can be assumed between regional economic growth and human capital (measured with the share of highly qualified employees within the population).

Higher human capital stock presumably has a stimulating effect on innovation and through this on productivity growth. At the same time, this particular relationship is negative in the peripheries, as these areas are sparsely populated, the human capital stock is low, and thus technological development is also below the development level of central regions.

With regard to R&D expenditures (GERD<sup>9</sup>), the picture is not so clear, which can probably be explained with the placing of research centres supported from public and Community funds in less developed regions (*see Table 5*).

Local pass-through (e.g. technological) effects result in a positive relationship between growth and the territorial agglomeration of economic activities: the nearness of innovation clusters and the positive agglomeration forces in general have a positive impact on productivity.

Due to the centralisation of corporations that employ innovative, knowledge intensive and highly qualified staff, the centre gains a permanent advantage over the less developed regions, where standardised, routine production processes prevail. According to *McCann* (2001), as a result of the favourable agglomeration effects (increasing input demand that should primarily be satisfied from regional supply; higher level of innovation etc.), the income elasticity of the import demand of the region declines, while that of export demand increases. However, an overall general decline is typical of regions where the majority of companies produce export products of relatively low



Table 5

**GERD (R&D EXPENDITURE AS A PERCENTAGE OF GDP)**

GDP, %	1999	2004	2007
Central Hungary	1.02	1.25	1.33 (1)
Central Transdanubia	0.28	0.50	0.50 (5)
West Transdanubia	0.24	0.38	0.60 (4)
South Transdanubia	0.28	0.40	0.37 (7)
North Hungary	0.16	0.27	0.42 (6)
North Great Plain	0.56	0.71	0.85 (2)
South Great Plain	0.59	0.61	0.84 (3)

Note: ranking in brackets.

Source: Eurostat

income elasticity (e.g. standardised, mature products), and at the same time they significantly depend on imports as well [e.g. in those peripheral regions where, following a serious fall in industrial activity, employment increased considerably at the “footloose”<sup>10</sup> FDI companies]. The final outcome: a permanent disparity between the regional development of the centre and that of the periphery.

The disparities in domestic regional development are shown in Table 6 and Chart 3. Table 6 is a summary for 2007 of the performance of the regions reviewed so far.

The numbers in the columns of the table show the serial numbers of individual regions

according to a given indicator. It is clearly visible that Central Hungary occupies the first place in all respects. Central and West Transdanubia have medium ranking (mostly with 2nd or 3rd best results), while the character of the remaining regions is strongly peripheral.

This same centre–periphery division is displayed in Chart 3. However, the performance compared to the Community average is also displayed here. It is a remarkable fact that only Central Hungary reaches the Community average. [Compared to previous years, performance is stagnant here as well, as indicated by the – (minus) sign.] The performance of Central

Table 6

**REGIONAL DISPARITIES – SUMMARY**

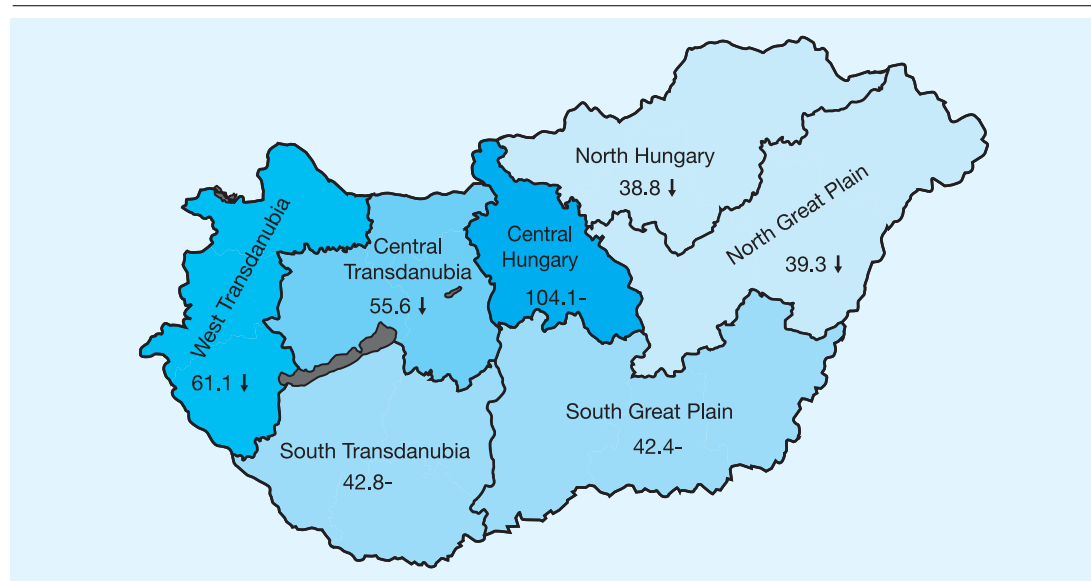
	Per capita GDP	Percentage of GDP	Investment	Unemployment	High-tech	GERD
Central Hungary	1	1	1	1	1	1
Central Transdanubia	3	2	2	3	2	5
West Transdanubia	2	3	3	2	4	4
South Transdanubia	4	6	7	5	3	7
North Hungary	6	7	4	7	5	6
North Great Plain	7	4	6	6	6	2
South Great Plain	5	5	5	4	7	3

Note: GERD = gross expenditure on research and development

Source: own editing

Chart 3

**PER CAPITA GDP (PPS, AS A PERCENTAGE OF THE AVERAGE OF THE EU 27, 2008)**



Source: Own editing based on HCSO and Eurostat data.

Table 7

**REGIONAL CONVERGENCE**

	1995–2000	2000–2004	2004–2008	1995–2008
Central Hungary	0	0	0	0
Central Transdanubia	-1.512	0	-0.14	-0.34
West Transdanubia	0	0	-0.018	0
South Transdanubia	0.448	0.167	0.051	0.554
North Hungary	0.362	0.076	0.075	0.538
North Great Plain	0.353	0.087	0.058	0.341
South Great Plain	0.747	0.152	0.048	0.785

Source: Own calculations based on HCSO data

and West Transdanubia is at around 60 per cent of the average of the EU 27 (with a weaker performance than in earlier years: i), while peripheral regions do not even reach 50 per cent of the Community average.

Regional disparities have already been described clearly by the above data. However, the aforementioned catch-up rate allows more insight. Applying the rate for the performance of the regions of Hungary (see Table 7) reveals that only Central and West Transdanubia show

signs of catching-up. No catching up is attained at all in South Transdanubia, the South Great Plain, the North Great Plain and North Hungary. Namely, the positive value of the catch-up rate indicates an increase in the distance, in backwardness.

According to *Büllhart – Sbergami* (2009), in the period following rapid growth, the economy may be characterised by excessive economic concentration (concentration may even exceed the optimum level). Regarding

Hungary's future prospects, one may only rely on Williamson's (1965) findings, i.e. with an improvement in infrastructural conditions and an expansion of the market, as a result of congestion (crowdedness, overpopulation) externalities, the more scattered economic geography may be more advantageous. After reaching a certain income level, concentration does not have an effect or rather has an adverse effect on development. Dynamic gains stemming from the agglomeration face static losses resulting from congestion. The relative significance of these two effects varies depending on the stages of development. As the gains from human capital accumulation are the most significant in the initial stages of development, and the losses resulting from congestion do not depend on the level of development, the relative significance of congestion increases in parallel with the rise of the level of development (Bertinelli – Black, 2004). Centrifugal forces become effective, and they may already result in a more balanced regional development.

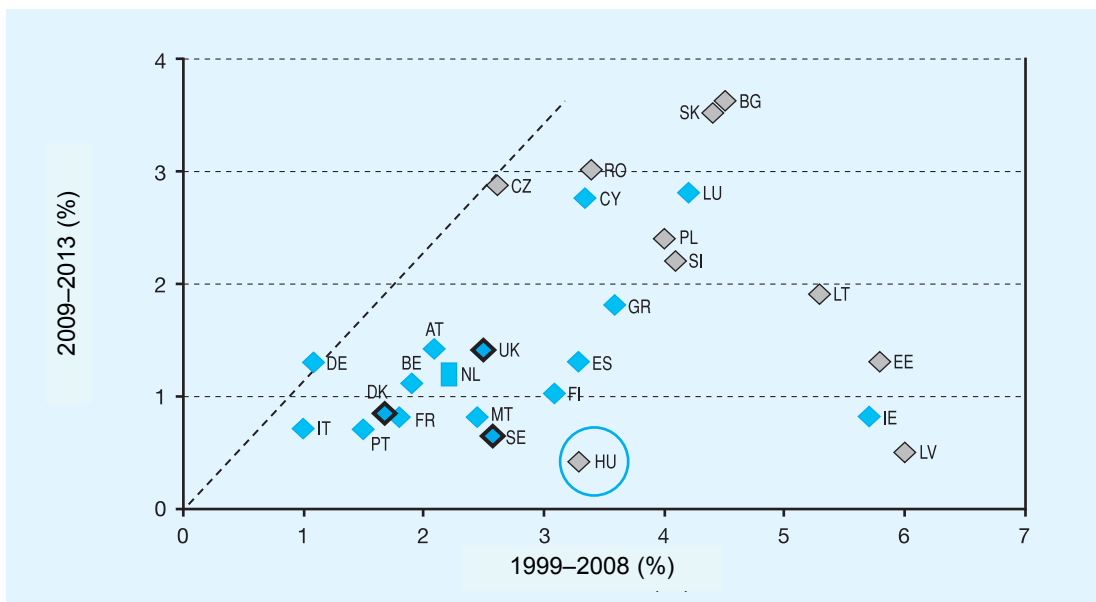
### THE EFFECT OF THE CRISIS ON REGIONAL GROWTH

We could see that growth in Hungary has decelerated following accession to the EU; the distance compared to the average of the region has increased. Convergence, the process of catching up itself entails many risks (high degree of openness, higher external financing requirement, rapid expansion in financial integration and loans outstanding, growth that exceeds supply potential etc.). The crisis resulted in a further deepening of problems. Capital cost increased as a result of the higher risk rating, leading to a general shortage of funds. Unemployment increased, investment declined, also entailing a decline in TFP growth. Industrial production and the GDP fell. Under these circumstances, real convergence prospects deteriorated drastically.

Commission forecasts (EC, 2009b) suggest that the 3–4 per cent annual growth of potential output may decline to below 1 per cent (see Chart 4). This means that instead of real con-

Chart 4

#### POTENTIAL GROWTH (1999–2008; 2009–2013)



Source: EC (2009b)

vergence, the distance to more developed countries might even grow. This is called convergence crisis by Halmai – Vásáry (2010).

The question is how the general recession is reflected in the performance of the regions. Some authors (Petrakos et al., 2005) believe that regional disparities follow a pro-cyclical pattern in the EU: the difference increases in the period of economic expansion and decreases in the period of slow growth.

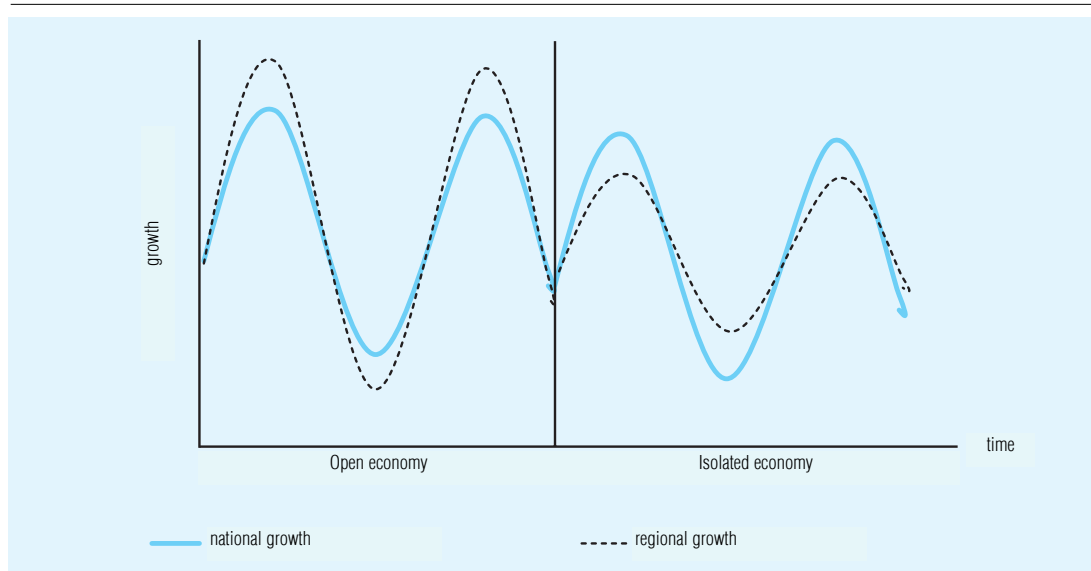
As a result of the pro-cyclical pattern, so-called sheltered economies (Padoa – Schioppa, 1993) evolve in the periphery of the countries concerned. The poorest regions become increasingly detached from the market, and increasingly depend on public employment opportunities, government transfers and subsidies, instead of viable entrepreneurial initiatives. Therefore, regions on the periphery become increasingly unable to compete in an increasingly integrated market, and become less and less able to make use of the opportunity of convergence in the period of economic upturn (Pekkala, 2000).

Economies that rely on the manufacturing sector and business-centred services, where strong competition is typical, are usually much more open than economies based on agriculture and non-market oriented services. Open economies are generally more influenced by cycles: they grow more rapidly in periods of upturn and more slowly in periods of deceleration or downturn. Cycles affect less open economies to a lesser extent, either because of the relative isolation or because of the dominance of sectors that do not depend on market effects that much. In addition, a more limited utilisation of local resources is also typical of sheltered economies (lower employment rate, higher unemployment rate).

The pro-cyclical nature is a result of the fact that in the period of an upswing, the growth of isolated regions remains below the national average; however, they are also less affected by downturns. The reaction of open regions is just the opposite; their growth exceeds the average in times of upturns, but in periods of recession their decline is also more significant (see Chart 5).

Chart 5

**5 PRO-CYCLICAL REGIONAL DISPARITIES**



Source: Rodríguez-Pose – Fratesi, 2006

This pro-cyclical nature can clearly be identified in the regional development in Hungary. The unfavourable effects of the crisis were much stronger in the central regions (Central Hungary, Central and West Transdanubia). Employment declined to a significantly greater extent in the regions that drive growth (see Table 8).

Employment declined to a lesser extent in the peripheral regions, where the level of unemployment had been higher from the outset. The picture is not so clear in relation to industrial production. Undoubtedly, the greatest downturn was observed in the Central and West Transdanubian regions, which otherwise have good indicators, but the decline in production in the Central Hungary region was lower than the average (see Table 9).

It is apparent that in the short-term, the

existence of sheltered, peripheral economies does not necessarily add to regional disparities. In certain cases (for example in crisis periods), convergence is also conceivable. However, over the longer term an increase in regional disparities is much more likely than convergence.

### CLOSING THOUGHTS: CONVERGENCE AND GROWTH

Based on empirical analyses, it is clear that growth and catching up in Hungary were driven by some regional poles (Central Hungary, Central and West Transdanubia). The Central Hungary region, which includes the capital, showed a systematically better result (in all indicators).

Both the analysis of available statistical data and the calculations in connection with the

Table 8

#### THE EFFECT OF THE CRISIS ON EMPLOYMENT

%	2007	2008	2009	Change
Central Hungary	59.7	62.7	54.8	-8.1
Central Transdanubia	58.5	60.3	51.1	-9.2
West Transdanubia	63.0	62.1	52.8	-9.3
South Transdanubia	52.8	51.0	46.1	-4.9
North Hungary	48.1	49.5	43.0	-6.5
North Great Plain	48.8	49.9	43.1	-6.8
South Great Plain	55.3	54.5	46.9	-7.6

Source: Own editing based on HCSO data

Table 9

#### THE EFFECT OF THE CRISIS ON INDUSTRIAL PRODUCTION

(previous year = 100)

%	2008	2009	Change
Central Hungary	99.7	90.4	-9.6
Central Transdanubia	93.6	74.4	-25.6
West Transdanubia	99.8	75.2	-24.8
South Transdanubia	100.8	84.8	-15.2
North Hungary	94.5	80.4	-19.6
North Great Plain	97.6	92.6	-7.4
South Great Plain	94.8	89.5	-10.5

Source: Own editing based on HCSO data

catch-up rate show that Hungarian regional development is strongly differentiated, and the so-called centre–periphery relationship can clearly be identified. According to the international literature, a strong concentration of economic activities such as this is typical of the early stage of development.

After reaching a certain level of income, with an improvement in infrastructural conditions and an expansion of the market, a more scattered economic geography may be more advantageous because of certain externalities (congestion, overpopulation). As the gains from human capital accumulation are the most significant in the initial stages of development, and the losses resulting from congestion do not depend on the level of development, the relative significance of congestion grows in parallel with the rise of the level of development. Centrifugal forces become effective, and they may already result in a more balanced regional development. The Hungarian economy, however, has not reached this level of income (according to the literature, around 80 per cent of the average per capita GDP of the EU 27) yet. Therefore, regional disparities are expected to continue to increase.

The economic crisis resulted in an interesting, somewhat paradoxical situation. The crisis has had an extremely unfavourable effect on the economic performance of Hungary. Nevertheless, in a paradoxical manner – even if only temporarily and to a small extent – it reduced regional disparities. This is explained by the pro-cyclical nature of regional development, which means that in times of upswings sheltered (peripheral) economies grow more slowly, but in times of crises the downturn is less significant than in the central regions that drive growth.

Convergence and territorially balanced economic growth require a faster increase in income, employment and the economy in weaker regions than in stronger ones.

However, it is rather difficult to decide what measures would strengthen the growth capacity of regions most. The theory emphasises that *growth factors* (e.g. human capital and R&D investment, innovation) *should be enhanced simultaneously*.

Accordingly, it is clear that cohesion policy may complement and support growth objectives in a number of areas, as one of its most important targets is real convergence, i.e. making the less developed countries/regions catch up. However, much depends on the efficient utilisation of resources, and this efficiency raises a fundamental question: supporting excellence (the best developing regions) or balanced development results in the highest efficiency?

There are two basic approaches upon determining the priorities.

① Resources are concentrated to the national centres that develop best, which guarantees the highest possible return on investment. Other resources intended to be used for innovative activities are also accumulated in these centres (e.g. within framework programmes).

② Resources are concentrated to the weaker regions, to activities that are not covered by national programmes. The objective is to enable less developed regions to participate, in the future, in domestic and European projects that focus on competitive, progressive research activities and technological innovations.

Based on relevant analyses, it is clear that the complementary nature of growth and territorial concentration also entails serious economic policy consequences. A trade-off problem may arise: efficiency or equalisation? Decision-makers have to decide whether it is worth concentrating the resources on the best, most prepared centres (maximising the benefits to the country and the region), or the resources should be used for building out the innovation capacity in the weaker regions as well, to enable them to gradually become involved in more innovative and more competitive programmes.

Table 10

**THE “COMPLEMENTARY” NATURE OF COHESION AND INNOVATION POLICIES**

	Innovation policy	Cohesion policy
Nature	Sectoral	Geographical
Territorial location of beneficiaries	Best developing central regions	Less developed regions
Supported activity	The most competitive innovative activities (new, internationally competitive activities)	Competition and innovation at regional level
Strength	Support to R&D	Prepares for innovation programmes
Weakness	Support to small, less rapidly developing companies is missing	Disregards the demand side of innovation

At first glance, the answer seems obvious: supporting the outstanding regions in order to maximise national welfare. However, a more thorough examination of the two relevant policies of the Community (innovation and cohesion) reveals that it is not necessary to take a decision concerning the two possibilities (see Table 10). Namely, through the coordination of innovation and cohesion policies (i.e. through the termination of the overlaps) both objectives can be kept in view. In the event that innovation and R&D are given priority, offsetting the possible negative effects arising from the aspect of cohesion may be the task of cohesion policy.

If harmony between the two policies is attained, it may bring the following benefits at national level:

- development of regional research and innovation capacities;

- it encourages the inclusion of research achievements in local social-economic processes; thus they may contribute to economic growth faster;
- through its resource mobilisation ability, it increases public and private research and innovation investment in the region, which has a benign effect on economic as well as social development;
- through creating an innovative environment, the latest results of research and innovation – without which there is no chance of catching up – may reach the least developed regions as well;
- with the coordination of innovation and cohesion policies the whole innovation process can be covered (while innovation policy focuses on excellence, cohesion policy prepares for the innovation policy, and ensures an innovative environment).

NOTES

<sup>1</sup> The  $\beta$ -convergence shows the correlation between the initial income and the growth rate.

<sup>2</sup> Verdoorn assumes a linear relationship between labour productivity and output. The quotient of productivity and output growth indicate an increasing scale yield.

<sup>3</sup> For further details on new growth models see, for example, Meyer, 1995.

<sup>4</sup> Regarding the role of the territorial dimension see also: Csaba, 2006; Lengyel – Rechnitzer, 2004.

<sup>5</sup> Catch-up rate,  $Felzárkóztatási ráta = 100 \times \frac{\Delta(y_{it} - y_t^*)}{y_{it-1} - y_{t-1}^*}$  where  $y_{it}$  is the per capita GDP level in purchasing power standard in country  $i$ , at time  $t$ ;  $y_t^*$  is the weighted average of the EU 25; while  $\Delta$  is the absolute difference between  $t$  and  $t-1$ . In the case of a negative catch-up rate the difference between the given country and the EU average decreases,

while a positive rate shows an increase in the difference.

<sup>6</sup> This shows the developments in per capita GDP disparity, i.e. the changes in the fluctuation of per capita GDP around the average value.

<sup>7</sup> Brülhart and Sbergami (2009), however, call the attention to the fact that the aggregate pattern masks considerable heterogeneity across sectors. Their estimates suggest that the growth effects of financial-sector agglomeration increase as countries get richer

– consistent with a “reverse Williamson hypothesis” for this industry.

<sup>8</sup> For more details on expenditures spent on research and development and on the correlation between growth and competitiveness see Török – Borsi – Telcs, 2006.

<sup>9</sup> GERD: Gross Expenditures on Research and Development

<sup>10</sup> Companies that do not need knowledge related to the location and that may be characterised by low salaries.

## LITERATURE

AGHION, P. – HOWITT, P. (1998): Endogenous Growth Theory. *Cambridge, MA. MIT Press*

BARRO, R. J. – X. SALA-I-MARTIN (1995): *Economic Growth*, McGraw-Hill, New York

BALDWIN, R. – FORSLID, R. – MARTIN, P. – OTTAVIANO, G. – ROBERT-NICOUD, F. (2005): *Economic Geography and Public Policy. Princeton University Press, Princeton*

BALDWIN, R. E – P. MARTIN (2004): Agglomeration and regional growth. In: Henderson, J. V. – Thisse, J. F. (ed.): *Handbook of Regional and Urban Economics*, 2671–2711, Elsevier

BERTINELLI, L. – BLACK, D. (2004): Urbanization and growth. *Journal of Urban Economics*, Volume 56, No. 1.

BOULHOL, H. – DE SERRES, A. – MOLNAR, M. (2008): The Contribution of Economic Geography to GDP per Capita. *OECD Journal: Economic Studies*

BRÜLHART, M. – SBERGAMI, F. (2009): Agglomeration and growth: Cross-country evidence. *Journal of Urban Economics*, Volume 65, pp. 48–63

CSABA, L. (2006): How much trade and FDI theories help analyzing competitive-related issues? In: Winiecki J (ed.): *Competitiveness of New Europe*. London: Routledge

ERDŐS, T. (2003): Fenntartható gazdasági növekedés [Sustainable Economic Growth]. *Akadémiai Kiadó, Budapest*

FUJITA, M. – THISSE, J. (2002): *Economics of Agglomeration: Cities, Industrial Location, and Regional Growth. Cambridge University Press*

GROSSMAN, G. – HELPMAN, E. (1991): *Innovation and Growth in the Global Economy. MIT Press, Cambridge*

FERKELT, B. (2006): A monetáris integráció hatása a területi egyenlőtlenségekre [The Effect of Monetary Integration on Regional Disparities]. *PhD Thesis – PTE (University of Pécs)*

HALMAI, P. (2009): Felzárkózás és konvergencia az Európai Unióban [Catching Up and Convergence in the European Union]. *Statisztikai Szemle*, 1. szám [Issue 1], pp. 41–63

HALMAI, P. – VÁSÁRY, V. (2010): Real convergence in the new Member States of the European Union. Shorter and longer term prospects. *The European Journal of Comparative Economics*, Volume 7, n. 1, pp. 229–253

HARRIS, R. (2008): Models of Regional Growth: Past, Present and Future. *Centre for Public Policy for Regions* <http://www.spatial-economics.ac.uk/textonly/SERC/publications/download/sercdp0002.pdf>

KRUGMAN, P. (1980): Scale Economies, Product Differentiation and the Patterns of Trade. *American Economic Review*, Volume 70, pp. 950–959

KRUGMAN, P. (1991): *Geography and Trade. Cambridge, MA: MIT Press*

KRUGMAN, P. R. – VENABLES, A. J. (1990): Integration and the competitiveness of peripheral industry. *Centre for Economic Policy Research Discussion Paper*, Series 363.

KRUGMAN, P. – VENABLES, A. (1995): Globalization and the inequality of nations. *Quarterly Journal of Economics*, Volume 110, pp. 857–880



- LENGYEL, I. – RECHNITZER, J. (ed.) 2009: *A regionális tudomány két évtizede Magyarországon* [Two Decades of Regional Science in Hungary], Akadémiai Kiadó, Budapest
- LENGYEL, I. – RECHNITZER, J. (2004): Regionális gazdaságtan [Regional Economics] *Dialóg Campus, Budapest–Pécs*
- LUCAS, R. E. (1988): On the Mechanics of Economic Development. *Journal of Monetary Economics*, Volume 22, pp. 3–42
- MANKIW, N. G. (1999): Makroökonómia [Macroeconomy], *Osiris Kiadó, Budapest*
- MANKIW, G. N. – ROMER, D. – WEIL, D. (1992): A Contribution to the Empirics of Economic Growth. *Quarterly Journal of Economics*, Volume 107, No. 2.
- MARTIN, P. (1999): Public policies, regional inequalities and growth. *Journal of Public Economics*, Volume 73, No. 1.
- MARTIN, P. – OTTAVIANO, G. (1999): Growing locations: Industry location in a model of endogenous growth. *European Economic Review*, Volume 43, No. 2.
- MCCANN, P. (2001): *Urban and Regional Economics*. Oxford University Press
- MEYER, D. (1995): Az új növekedésmélet [The New Growth Theory]. *Közgazdasági Szemle*, 4. szám [Issue 4], pp. 387–398
- MEYER, D. (2005): Az új gazdaságföldrajz gazdaságpolitikai implikációi – növekedésméleti megközelítésben [Economic Policy Implications of the New Economic Geography – With a Growth Theory Approach]. In: Dombi Ákos (ed.): *Gazdasági növekedés Magyarországon* [Economic Growth in Hungary]. Műegyetemi Kiadó, pp. 61–74
- PADOA-SCHIOPPA, F. (1993): Italy, the sheltered economy: structural problems in the Italian economy. *Clarendon Press, Oxford*
- PEKKALA, S. (2000): Aggregate economic fluctuations and regional convergence: the Finnish case 1988–95. *Applied Economics*, Volume 32
- PETRAKOS, G. – RODRÍGUEZ-POSE, A. – ROVOLIS, A. (2005): Growth, interregional disparities in the European Union. *Environment and Planning*, Volume 37, No. 10.
- PORTER, M. (1998): Clusters and the new economics of competition. *Harvard Business Review*: pp. 77–90
- RODRÍK (2001): The global Governance of Trade As if Development Really Mattered. *Report submitted to the UNDP*. <http://www.mtholyoke.edu/courses/epaus/econ213/rodriggovernance.PDF>
- RODRÍGUEZ-POSE, A. – FRATESI, U. (2006): Regional business cycles and the emergence of sheltered economies in the southern periphery of Europe. *Bruges European Economic Research Papers*, No 7. <http://www.coleurop.be/eco/publications.htm>
- ROMER, P. M. (1986): Increasing returns and long-run growth. *Journal of Political Economy*, Volume 94, No. 5.
- ROMER, P. M. (1990): Endogenous Technological Change. *Journal of Political Economy*, Volume 98, pp. 71–102
- SOLOW, R. (1956): A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, Volume 70, No. 1.
- TÖRÖK, Á. – BORSI, B. – TELCS, A. (2006): *Competitiveness in Research and Development. Comparisons and Performance*, Edward Elgar Publ. Co., Cheltenham, GB–Northampton, USA
- VERSAPAGEN, B. – SCHOENMAKERS, W. (2004): The spatial dimension of patenting by multinational firms in Europe. *Journal of Economic Geography*, Volume 4, pp. 3–42
- WILLIAMSON, J. G. (1965): Regional inequality and the process of national development. *Economic Development and Cultural Change*, Volume 13, No. 4.
- European Commission, Economic and Financial Affairs (2009a): Five years of an enlarged EU. Economic achievements and challenge. *European Economy*, 2009/1
- European Commission, Economic and Financial Affairs (2009b): Economic Crisis in Europe: Causes, Consequences and Responses. *European Economy*, 2009/7
- OECD (2003): *The Sources of Economic Growth in OECD Countries*. OECD, Paris