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Annekatrien Niebuhr*, Friso Schlitte**

Convergence, Trade and Factor Mobility in the European Union – Implications for Enlargement and Regional Policy

The accession of ten new members in May 2004 means a considerable increase in income disparities in the European Union. At what speed has income converged in the past and what role have changes in trade relations and factor mobility played in this? What projections can be made for the catching-up process of the new member states? And what conclusions should be drawn for the future of EU regional policy?

One of the basic objectives pursued by the European Union is economic convergence among its countries and regions, i.e. a reduction of existing differences in income and employment. According to the latest report on economic and social cohesion published by the European Commission, income disparities increase considerably with the accession of the 10 new member states in May 2004.¹ The gap between average GDP per capita and income in the poorest member states, measured in Purchasing Power Standards (PPS), has doubled with enlargement. Recent estimates point to an income level in the accession countries that amounts to 49% of the EU15 average in 2003. GDP per capita ranges from less than 38% of the EU15 level in Latvia to 78% in Cyprus. Disparities between EU regions widen even further than income differences between EU countries. The poorest region, Lubelskie in Poland, reaches only 31% of average per capita income in the EU.²

Cohesion policy has to be adjusted to this change in the scale of disparities across the enlarged EU. At present, 90% of the NUTS 2 regions in the acceding countries are eligible for financial support under Objective 1 of EU regional policy (GDP per capita below 75% of EU average). Applying the eligibility criterion, only Praha in the Czech Republic (135% of EU average), Bratislavský in Slovakia (102%), Közép-Magyarország in Hungary (81%) and Cyprus (78%) would currently not be eligible. The number of people living in Objective 1 regions will rise from around 73 to 123 million due to enlargement. Moreover, the European Commission proposes transitional arrangements for the period after 2006 for those regions in the EU15 affected by the statistical effect. In some of the current Objective 1 regions income per capita exceeds the 75%-level after enlargement because the EU aver-

age declines with the accession of the new member states.

These changes have implications for the funds necessary to implement EU regional policy. In order to cope with the challenge of enlargement, the EU's financial perspective for the period 2007-2013 includes an increase of the total annual appropriations for payments to € 143.1 billion in 2013, i.e. 1.14% of EU Gross National Income (GNI).³ However, some of the net payers among the EU15 member states have recently demanded that the EU budget should not exceed 1% of GNI. The budgetary discussions focus on regional policy since the financial framework for the Common Agricultural Policy (CAP), currently the largest item in the budget, is already fixed until 2013. The second major position in the proposed EU budget for the 2006-2013 period is for cohesion policy. The debate on the future design of cohesion policy and resulting expenditures points to the importance of these issues in the enlarged EU. The EU Commission argues that the new member states will need substantial financial support to realise convergence towards the income levels in the EU15 within a reasonable period of time. The speed of convergence is highly important in this context, since the convergence rate determines the period of structural support and, hence, the amount of required funds for a given political framework.

This paper analyses the speed of income convergence in the EU15 over the past decades and the catching-up process among the member states of the EU25 since the mid-1990s. Based on an analysis of different convergence mechanisms, we discuss the

¹ European Commission: Third Report on Economic and Social Cohesion, Brussels 2004.

² See <http://europa.eu.int/comm/eurostat/> and EUROSTAT: One fifth of EU regions and 9 out of 10 Acceding Country regions below 75% of EU15 average, news release 21/2004, Luxembourg.

³ European Commission: Building our common future: policy challenges and budgetary means of the enlarged Union, 2007-2013 COM(2004)101.

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effects of economic integration on the rate of convergence. The findings are used to project the catching-up process of the new member states and derive implications with respect to the design of structural funds and cohesion policy in the enlarged EU.

We begin by describing the methodology applied to analyse income convergence in the EU. Empirical results on convergence in Europe since the 1950s are then presented, followed by an investigation of the development of income disparities in the EU25 since 1995. The significance of changes in trade relations and factor mobility in the course of European integration is then discussed. Finally, we summarise the main results and draw conclusions regarding the future of EU regional policy.

Methodology – β - and σ -Convergence

We apply the well-known concepts of β - and σ -convergence in order to analyse the development of disparities in the EU and the speed of convergence. The concept of β -convergence is based on the traditional neo-classical model of growth and postulates that poor economies grow faster than rich economies. If regions differ only in their initial income level and their capital endowment per worker, they will converge to the same level of per capita income. This is referred to as absolute β -convergence. However, if regions are marked by different steady states, i.e. differences in technology, economic structures or qualification of the work force, they will not converge towards the same income level. This is the concept of conditional convergence. We focus on absolute convergence since with respect to an EU policy aiming at regional equity this is the appropriate concept. Nevertheless, the analysis also considers conditional convergence because national differences are taken into account in order to distinguish between convergence among member states and interregional catch-up processes.

To investigate the relationship between initial income level and growth, we estimate the following equation

$$(1) \quad 1/T \ln(y_{iT} / y_{i0}) = a + \frac{(1-e^{-\beta T})}{T} \ln(y_{i0}) + u_i$$

The term on the left-hand side of equation (1) is the average annual growth of per capita income from the base year to the year T. Per capita income in region i at the beginning of the period under consideration is given by y_{i0} and u_i is a disturbance term. Applying non-linear least squares estimation gives a direct measure of the speed of convergence – the rate of convergence, β . Moreover, national factors are accounted for by including country dummies in equation (1). The crucial role played by national specifics is emphasised in the literature on regional growth and convergence.⁴

The half-life, i.e. the time that it takes to halve the initial income gap between two regions, is given by

$$(2) \quad \log(2) / \beta = 0.69 / \beta$$

In contrast to β -convergence, σ -convergence refers to the development of the dispersion of regional per capita income. β -convergence is a necessary, but not a sufficient condition for σ -convergence. σ -convergence is analysed by means of the standard deviation of per capita income. To allow for a direct comparison of the results of both convergence concepts, we standardise corresponding outcomes in the following way: the evolution of σ -convergence is measured by the development of the standard deviation in relation to its initial value. A comparable indicator derived from estimates of the convergence rate is defined as

$$(3) \quad b_{t+1} = b_t(1 - \hat{\beta}_t) \text{ with } b_0 = 1 \text{ and } \hat{\beta}_t = 1 - e^{-\hat{\beta}}$$

where $\hat{\beta}$ is the estimated rate of convergence based on a regression with $T = 1$.⁵

We investigate convergence in the EU using different data sets. The long-term process of convergence in the EU15 at the national level is analysed for the period 1950 to 2000. The corresponding investigation is based on national data on gross domestic product (GDP) per capita (dollar, constant 1996 prices) taken from the Penn World Tables.⁶ Regional convergence is examined for a cross-section of NUTS II regions in the EU15 between 1975 and 1998. Data on gross value added (GVA) per capita (euro, constant 1990 prices) was taken from Cambridge Econometrics' European regional database. The analysis of recent developments taking into account the accession countries is based on GDP per inhabitant between 1995 and 2001 (euro and PPS) available from the Eurostat Regio database.

Convergence in the EU15 since 1950

In the second half of the 20th century Western European countries showed a significant, but slow, catching-up process.⁷ At the national level, per capita incomes in the EU15 converged between 1950 and 2000 at an estimated average rate of about 1.6%.

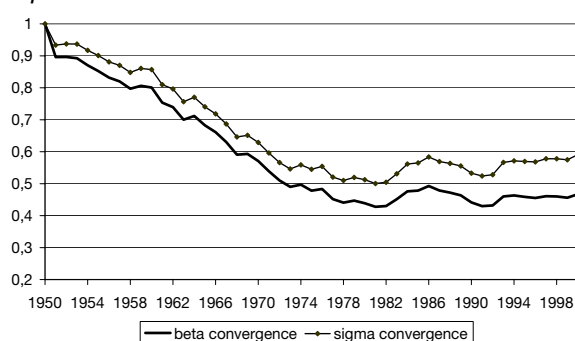
⁴ Cf. F. Canova: Are EU Policies Fostering Growth and Reducing Regional Inequalities? Opuscle del CREI No. 8, 2001, Universitat Pompeu Fabra.

⁵ Cf. J. Bröcker: Konvergenz in Europa und die Europäische Währungsunion, in: B. Fischer, T. Straubhaar (eds.): Ökonomische Konvergenz in Theorie und Praxis, Baden-Baden 1998, pp. 105-135, Nomos.

⁶ Alan Heston, Robert Summers and Bettina Aten: Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002.

⁷ Austria, Belgium, Denmark, Spain, Finland, France, Germany, the UK, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Sweden are included in the cross-section.

Figure 1
 β - and σ -Convergence among EU15-Countries



Source: A. Heston, R. Summers and B. Aten: Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002; own calculations.

This rate implies that existing disparities halve every 44 years. However, the consideration of different sub-periods shows that the speed of convergence was far from consistent over time.⁸ Figure 1 displays how the process of convergence evolved over the period 1950 to 2000. The upper line illustrates the convergence process in terms of σ -convergence. The lower line shows the process of β -convergence measured by the indicator b_{t+1} given by equation (3). In both cases income disparities are set to 1 at the beginning of the observation period. The steeper the downward sloping of the schedules, the higher is the speed of convergence, whereas an upward sloping line indicates divergence.

Though β -convergence does not necessarily imply σ -convergence, β - and σ -convergence seem to correspond throughout the period after 1950. Both graphs indicate that there was a strong convergence in the first two decades. In the 1960s convergence was fastest at a rate of about 3.5% p.a. In the 1950s and 1970s the average rate was also well above 2%. Half-lives in these decades range between 20 and 30 years. The mid-1970s are marked by a clear slow-down of the convergence process. The first half of the 1980s even shows an increase in disparities. After 1986 the process of convergence sets in again. But this prevails only for a short time. Altogether, disparities seem to have remained virtually unchanged since the mid-1980s. The results regarding the long-run changes in convergence in the course of time are confirmed by the findings of several studies. However, analyses of the most recent trends in regional income convergence in Europe provide no unambiguous answers. Some studies detect a slow process of convergence, whereas other findings point to simultaneous processes of conver-

⁸ For corresponding evidence see J. Bröcker, op. cit.

Table 1
 β -Convergence of GVA per capita among EU15 Regions

	1975-1998		1975-1984		1984-1998	
	Absolute convergence	Control for national effects	Absolute convergence	Control for national effects	Absolute convergence	Control for national effects
Intercept	0.0691** (6.15)	0.0881** (4.46)	0.0440* (1.89)	0.1242** (3.33)	0.0969** (4.64)	0.0688* (2.55)
β	0.0059** (4.19)	0.0075** (2.96)	0.0029 (1.12)	0.0111* (2.47)	0.0088** (3.52)	0.0051 (1.66)
Half-life	118	91	-	62	78	-
R ²	0.14	0.37	0.01	0.43	0.15	0.52

Source: Cambridge Econometrics Regional databank, own calculations.

** significant at the 0.01 level; * significant at the 0.05 level.

The half-life is only stated in case of a significant and correctly signed rate of convergence.

gence and divergence in different cross-sections and countries.⁹

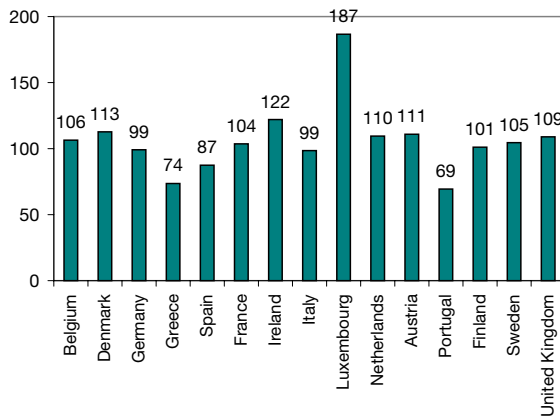
Applying the same methodology, we also analyse convergence patterns among EU15 regions at the NUTS II level between 1975 and 1998. Table 1 shows the regression results for the whole period as well as the results for two sub-periods. In principle, convergence at the national level and at the regional level shows similar patterns. Overall, the estimated average rate of absolute convergence is 0.6%. This implies that existing income gaps at regional level are halved only after more than a hundred years. Moreover, we cannot detect a significant absolute convergence in the period 1975 to 1984, confirming the evidence on the slow-down of the convergence process provided by the analysis at the national level. Between 1984 and 1998 the regional growth of EU regions is again marked by significant β -convergence. But the determined rate of convergence is rather low (0.9%), involving a half-life of almost 80 years.

As mentioned above, different structural parameters across economies possibly make regions converge towards different steady states. The results of several studies suggest that in particular national factors matter.¹⁰ Hence, determinants of economic growth are likely to be more similar in regions situated in the same country compared with those in foreign regions. Beside the results for absolute convergence, Table 1 shows estimates for the case where regions are allowed to converge towards different (country specific)

⁹ Cf. J. Bröcker, op. cit.; R. J. Barro and X. Sala-i-Martin: Economic growth, MIT Press: Cambridge, Mass. 1999; G. Tondl: Convergence after divergence? Regional growth in Europe, Vienna 2001, Springer Verlag; J. R. Cuadrado-Roura: Regional convergence in the European Union: From hypothesis to actual trends, in: Annals of Regional Science, Vol 35, No. 3, 2001, pp. 333-356.

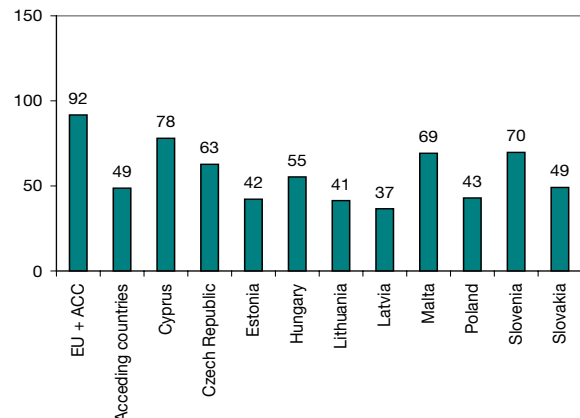
¹⁰ Cf. e.g. J. R. Cuadrado-Roura, op. cit.

Figure 2
GDP per capita 2003 in the EU15 Countries
 (PPS, EU15=100)



Source: Eurostat forecast, see <http://europa.eu.int/comm/eurostat/>.

Figure 3
GDP per capita 2003 in the EU25 Countries
 (PPS, EU15=100)



Source: Eurostat forecast, see <http://europa.eu.int/comm/eurostat/>.

steady states. The national effects are controlled by dummy variables. This method also permits us to differentiate between convergence among countries and regional convergence within countries. Over the period as a whole the convergence coefficient, at nearly 0.8%, was slightly higher than the coefficient for absolute convergence. This suggests that the convergence process among the EU regions was sustained by both convergence among, and declining disparities within, member states.

However, the analysis of the two sub-periods indicates that this result applies only to the phase until 1984, where this phenomenon was quite pronounced. Including controls for national effects, the regression yields a convergence rate of 1.1% for the period 1975-1984. This evidence contrasts with the absence of significant convergence under the assumption of identical steady states for all European regions. Conversely, in the second period, 1984-1998, the estimated rate of convergence is lower and not significant at the 5% level when country dummies are employed. This result is somewhat surprising since usually the rate of convergence increases as one moves from absolute to conditional convergence. The present findings suggest that the patterns of regional growth and convergence changed substantially in the 1980s. In contrast to the first period, convergence does not seem to have taken place at the regional level within countries since the mid-1980s. This indicates that the convergence process at the regional level might at present be driven exclusively by national factors. The relatively high income growth of lagging EU countries might be due to some regional growth leaders, while other less competitive regions persistently lag behind. Hence, regional disparities, especially within countries which catch-up, might not decline or even widen.

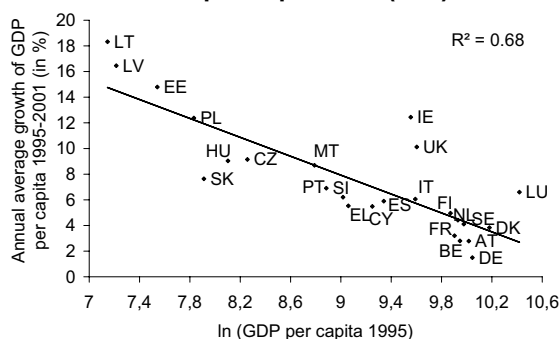
Recent Development of Disparities in the EU25

The enlargement by ten new member states leads statistically to a substantial rise in the disparities in income per inhabitant in the EU. Income disparities at the national level, measured in PPS, currently range between 69% of the EU15 average in Portugal and 187% in Luxembourg (see Figure 2). With the 10 accession countries (ACC) joining the EU the average GDP per capita declines to 92% of the former level, as shown in Figure 3. None of the new member states achieves an income above 80% of the EU15 mean. The average income level of the accession countries is less than half of the EU15 value. However, within the ACC group considerable disparities also prevail, ranging from 37% in Latvia to 78% in Cyprus. At the regional level, the increase in disparities is even more pronounced. In 2001, per capita income levels of 23% of the 213 NUTS II regions in the EU15 were below 75% of the EU15 average.¹¹ 28% of the EU25 regions reported per capita income levels below the 75% threshold. Only five out of the forty-one NUTS II regions in the acceding countries would not be eligible for support under Objective 1 since they realised a GDP per capita above the 75% limit. In Dytiki Ellada, Greece, the average income level was lowest in 2001 in the EU15 with 58% of the average in the EU25. The lowest income level in the new member states was reported in Lubelski, Poland, with 31%.

Since the middle of the 1990s, the new member states have experienced significantly higher growth rates than the EU15. In this section, we investigate recent developments in convergence in the EU25 among countries and regions. The analysis comprises GDP per capita data from 1995 to 2000/2001. Figure

¹¹ Source: Eurostat News Release 21/2004. Data: GDP per capita in Purchasing Power Parities.

Figure 4
Convergence in the EU25 - Correlation between National Growth of GDP per Capita 1995-2001 and GDP per Capita 1995 (PPS)



Source: Eurostat: One fifth of EU regions and 9 out of 10 Acceding Country regions below 75% of EU15 average, news release 21/2004, Luxembourg; own calculations.

4 shows that there is a significant negative correlation between the national income growth rates 1995–2001 and the initial income level in 1995 in the enlarged EU. The catch-up process of the new member states is a central feature of the European growth pattern in the second half of the 1990s. Moreover, convergence took place at an impressive speed. Corresponding estimates indicate highly significant absolute convergence with a convergence rate of roughly 4%. This result implies that the income gaps between new and old member states would halve in less than 20 years. However, due to the very short length of the period under consideration, data and regression results may be dominated by cyclical influences. Therefore, the conclusions drawn from these findings should be interpreted cautiously. The analysis has mainly a descriptive character. This also applies to estimates for the speed of regional convergence within the EU25 and the acceding countries, which we present subsequently.

The regression results in Table 2 show that in terms of absolute convergence there was a distinct decline in income disparities among NUTS II regions in Europe since the mid-1990s. Regional disparities in the EU25 declined at an annual rate of nearly 3%. At this rate, per capita income disparities would halve within approximately 23 years. Furthermore, the process of absolute convergence explains about 30% of the overall dispersion of regional growth rates. Regarding absolute convergence, the findings for the acceding countries do not differ systematically from those in the EU25. However, the estimated speed of convergence is clearly higher for the ACC10 group. The detected rate of convergence amounts to 4.4%. This implies that regional disparities in the new member states will decline by 50% within a period of only 16 years.

Table 2
 β -Convergence of GDP per capita (Euro) among Regions, 1995 to 2000

	EU25		ACC10	
	Absolute convergence	Control for national effects	Absolute convergence	Control for national effects
Intercept	0.3178** (12.01)	-0.0294 (-0.83)	0.4075** (3.81)	-0.3002* (-2.71)
β	0.0296** (9.11)	-0.0055 (-1.59)	0.0441* (2.67)	-0.0353** (-3.51)
Half-life	23	-	16	-
R ²	0.30	0.93	0.25	0.84

Source: Eurostat Regio databank; own calculations.
 Notes: ** significant at the 0.01 level; * significant at the 0.05 level. The half-life is only stated in the case of a significant and correctly signed rate of convergence.

The regression results change dramatically if we allow for different (country specific) steady state levels, confirming partly the results derived above for the EU15. When dummy variables are employed in order to capture convergence of GDP per capita at the national level, i.e. control for the decline of disparities among countries, the sign of the convergence coefficient changes. The negative convergence rate indicates that regional income growth in the EU25 was characterised by some divergence tendencies in the second half of the 1990s. However, for the EU25 cross-section the β -coefficient is hardly significant at the 10% level. In contrast, the regression yields a significant negative coefficient for the regions in the accession countries. The estimates imply that a strong divergence process took place among regions within the new member states with the regional disparities increasing annually by 3.5% between 1995 and 2000. Thus, the results for the ACC10 and the EU25 point to a potential equity-efficiency dilemma. Catching-up of the poor new member states at the national level seems to be driven mainly by a few high growth regions. The findings of several studies indicate that these high growth regions coincide essentially with highly competitive agglomerations, and hence with regions that are already marked by a relatively high GDP per capita.¹² Compared with the growth of dynamic metropolitan areas, the growth of GDP per capita in the least developed regions of the accession countries is rather modest. Therefore, the decline of disparities at the country level is accompanied by increasing regional disparities within the new member states.

An investigation of regional income disparities and their evolution in the EU25 also has to consider differences in price levels and their effects on purchasing power. Therefore convergence analyses are frequently based on income in purchasing power standards

¹² Cf. e.g. G. Tondl and G. Vukšić: What makes regions in Eastern Europe catching up? The role of foreign investment, human resources and geography, IEF Working Paper No. 54, 2003.

Table 3
Absolute β -Convergence of GDP per capita (PPS)
among Regions, 1995 to 2000

	EU25	ACC10
Intercept	0.1450** (5.91)	0.2602** (2.86)
β	0.0101** (3.79)	0.0243* (2.07)
Half-life	69	28
R ²	0.08	0.12

Source: Eurostat Regio databank; own calculations.

Notes: ** significant at the 0.01 level; * significant at the 0.05 level.

(PPS) that take into account differences in national price levels. These differences are based mainly on the prices of non-tradable goods, which do not converge to a common international price level. By using GDP per capita in PPS, we take into consideration that the price level in the new member states is lower than in the EU15 and, thus, purchasing power in the accession countries is higher than indicated by income measured in euro.

Table 3 presents the regression results for the speed of absolute convergence regarding GDP per capita in PPS. According to the estimates, regional growth in the EU25 is marked by absolute convergence. But taking into account price differences prevailing among the regions results in a significantly lower rate of convergence of 1% compared to the speed of almost 3% detected for incomes in euro. The same applies to regional convergence within the acceding countries, though the speed of convergence remains at a higher rate of 2.4%.¹³

The analysis of the recent development of disparities and growth in the EU25 points to significant absolute convergence. But filtering out the catching-up processes at the national level reveals that there are no convergence tendencies among regions in the EU25 and the ACC10 as a whole. Within the acceding countries a significant divergence of GDP per capita among regions even predominates. Again, this suggests that the catching-up of at least some countries might be accompanied by an increase in regional disparities within the respective countries. This possibly results in an equity-efficiency dilemma. The catching-up of the poor new member states seems to be caused mainly by the dynamic development of relatively prosperous agglomerations. Thus, there is a potential conflict between the ambition to achieve rapid growth in the acceding countries and the equity objective of EU re-

¹³ When all national effects are controlled for by dummy variables, regression results for income in PPS are identical to those based on income in euro. Again there is no significant convergence within the EU25 and significant divergence among the regions of the acceding countries.

gional policy. The first best policy to achieve cohesion at the national level could imply the focus of financial support on relatively prosperous agglomerations and capital regions.

There is more empirical support for this suggestion. Some previous studies identified a tendency towards regional divergence within countries that experienced higher income growth than the EU average.¹⁴ The catching-up to the EU15 average by the cohesion countries in the 1980s and 1990s seems to be accompanied by increasing disparities within countries as well. This applies particularly to Ireland and, to a lesser extent, to Spain. The main impulses for national growth and catching-up came from relatively prosperous and fast growing regions, especially from highly agglomerated regions. However, the evidence for Portugal is rather mixed. Catching-up in the 1980s was apparently not attended by widening regional disparities, whereas recent data point to a slight rise in disparities since 1995. Finally, in Greece the big agglomeration areas were not leading in growth, and Greece failed to catch up until the mid-1990s. However, regional disparities, which remained at a low level before, tended to increase since Greece succeeded in reducing the income gap to the EU average.

According to some studies, the contrast between national catch-up and increasing regional disparities is even more pronounced within the acceding countries than was the case in the cohesion countries.¹⁵ Empirical analyses of spatial development in the accession countries show that in the second half of the 1990s regional disparities within Poland, Hungary, the Czech Republic and Slovakia increased significantly. With the exception of the Czech Republic, these countries also experienced higher growth than the EU15. Moreover, in all of these countries the growth rates of capital regions and neighbouring areas were remarkably high. Overall, these results provide more evidence of a trade-off between the rapid development of poorer countries and regional convergence. Based on the observation of regional divergence within catching-up countries in Europe, some authors conclude that economic integration in Europe did not necessarily support the decline of income disparities at the regional level.¹⁶

¹⁴ S. Davies and M. Hallet: Interactions between national and regional development, HWWA Discussion Paper No. 207, 2002; K. Lammers: Die Osterweiterung aus raumwirtschaftlicher Perspektive – Prognosen regionalökonomischer Theorien und Erfahrungen aus der bisherigen Integration in Europa, in: Beihefte der Konjunkturpolitik, Vol. 53, 2002, pp. 9-38.

¹⁵ Cf. e.g. K. Lammers, *ibid.*

¹⁶ G. Tondl: The changing pattern of regional convergence in Europe, in: Jahrbuch für Regionalwissenschaft, Vol. 19, No. 1, 1999, pp. 1-33.

The Role of Trade and Factor Mobility

The results on the speed of convergence in the EU15 and the EU25 as well as the results concerning a potential equity-efficiency dilemma raise the question whether the ongoing process of economic integration in Europe has an impact on the development of disparities. What are the reasons for the general slowdown of convergence in the mid-1970s? Why is economic integration in the 1980s and 1990s associated with catching-up among nations on the one hand, and increasing spatial disparities within the member states on the other hand? Is the slowdown of convergence in the EU15 due to slower progress of integration among the old member states? Is the pronounced decline in income disparities in the EU25 during the last decade caused or at least promoted by the integration that already took place between new and old member states in the 1990s? How will the accession of the new member states in May 2004 affect the speed of convergence? Several economic theories emphasise the significance of integration, i.e. resulting increases in trade and factor mobility, for the development of income disparities. However, the specific effects of intensified trade and the free movement of production factors vary according to the underlying theoretical basis. We shall now discuss the effects of integration on convergence within different theoretical frameworks and survey corresponding empirical research.

The issue of convergence is frequently analysed within the framework of traditional and endogenous growth theory. Moreover, New Economic Geography (NEG) models might be used to investigate the effects of economic integration on regional disparities. The implications of these theoretical approaches with respect to the development of regional disparities differ considerably. Whereas traditional growth theory predicts convergence, NEG and endogenous growth theory both provide no clear-cut conclusions in this respect. Whether convergence or divergence of regional per capita income emerges depends crucially on the specific assumptions of the models. Fundamental differences between these theories also exist as to the effects of integration on convergence. According to traditional growth models, trade and factor mobility foster convergence. Within this traditional neo-classical framework, the marginal productivity of production factors, i.e. of labour and capital, is assumed to be higher in regions where the respective factor is scarce. Typically in poorer regions labour is relatively abundant, but there is a relatively low endowment of capital. Increasing the mobility of capital and labour would thus lead to faster equalisation of factor proportions and income between regions. Moreover, trade results in specialisation in production that intensively

uses factors that are relatively abundant. Furthermore, via trade and factor mobility, in particular via foreign direct investment (FDI), new technologies and knowledge can be transferred to less developed regions. Therefore trade and factor mobility are regarded as important channels for convergence.¹⁷

In contrast, in NEG models and endogenous growth theory, economic integration does not a priori support a convergence process. Even the opposite case is possible. In NEG, on the one hand declining barriers to trade and factor mobility can encourage movements away from less prosperous peripheral regions to exploit positive externalities in agglomeration areas. On the other hand integration can encourage the relocation of firms and population to peripheral sites to benefit from lower prices of immobile factors. According to NEG models the former case, implying diverging regional incomes, dominates in the beginning of an integration process, when transaction costs are still relatively high. The latter case, resulting in convergence, succeeds when transactions costs have already been reduced to a relatively low level. Thus, depending on the stage of integration, a further reduction of impediments to trade and factor mobility might initiate convergence or divergence in NEG models.¹⁸

Finally, in endogenous growth models the impact of trade on the one hand and factor mobility on the other hand can differ. In general, factor mobility will reinforce the prevailing trend that marks the development of disparities in autarky. If we observe declining disparities among closed economies, the convergence of per capita income will be sustained by the movements of mobile factors between open economies. However, if divergence characterises the development of the closed economies, factor mobility will foster the widening of disparities. Trade with innovative production goods and the diffusion of new technological knowledge can counteract the increasing income disparities which may result from differences in the innovative activities of regions. Trade might act as a means of spreading new technological knowledge and therefore promote the convergence process. However, whether trade and the transfer of knowledge give rise to convergence depends crucially on the geographical extent of the corresponding effects. In the case of the unrestricted global diffusion of new capital goods and knowledge, convergence results. If, on the contrary, the geographical scope of interregional spillovers is

¹⁷ Cf. R. J. Barro, X. Sala-i-Martin, op. cit.; and G. Tondl: Convergence after Divergence? ..., op. cit.

¹⁸ K. Lammers, S. Stiller: Regionalpolitische Implikationen der neuen ökonomischen Geographie, HWWA Discussion Paper 85, Hamburg 2000; D. Puga: The Rise and Fall of Regional Inequalities, in: European Economic Review, Vol. 43, No. 2, 1999, pp. 303-334.

bounded because of the frictional effects of distance, persistent regional disparities will emerge.¹⁹

Trade and capital mobility have increased considerably in the EU during the last couple of decades. This is probably the result of various attempts to reduce the remaining impediments to cross-border relationships in Europe. However, significant border impediments that relate to different fields, such as trade in services or socio-cultural barriers, still exist. In particular, labour mobility is relatively low within the EU at present. There is neither important cross-border migration nor considerable domestic migration within the countries. Up to now, there is no comprehensive empirical evidence on the relationships between trade, factor mobility and the process of convergence in the EU. However, some studies point to a positive relation between convergence and the degree of economic integration where cross-country convergence is concerned. At the regional level there is also evidence that integration might only promote a catch-up process of specific regions towards the income level of the more prosperous EU regions.²⁰

Ben-David analyses the relationship between the elimination of trade barriers and income convergence at the country level. The study focuses upon the formation of the European Economic Community (EEC) and the European Free-Trade Area (EFTA), the liberalisation between EEC and EFTA, and the entry of Denmark, Ireland and the United Kingdom into the EEC. The objective of the analysis is to identify possible links between convergence among the integrating countries and the timing and extensiveness of trade liberalisation. The findings suggest that with the removal of trade barriers, the intensity of trade rose and the dispersion of per capita income decreased more rapidly. Taking the trade liberalisation as exogenously given, the author concludes that there is a positive correlation between trade intensity and speed of convergence.²¹ Cuadrado-Roura states that migration from low income regions to prosperous industrialised areas is an important factor for explaining the rapid catch-up process of poor regions in the 1950s and 1960s. The deceleration of economic convergence in the mid-1970s was caused by the slow-down of migration and growth, the latter being due to the international economic crisis. The unfavourable economic

development in Europe continued until the middle of the 1980s.²²

According to Bröcker, there is a positive correlation between convergence and economic integration in Europe.²³ The convergence process was fastest in the period after the implementation of the EEC in the 1960s. In the 1980s, when incomes temporarily diverged, the integration process in the EC came to a halt until the initiatives for the Single European Market reinforced the integration process. However, the acceleration of economic integration could not restore the high rates of migration of the 1950s and 1960s. At that time, migration flows from south to north were pulled by labour shortages in European countries. In the 1980s, unemployment rates increased significantly in the more prosperous regions in Europe. Migration is more likely to depend on the employment prospects of labour markets at the potential destination relative to the prospects at home, and not exclusively on differences in per capita income levels. Reducing formal barriers to international migration might therefore play a minor role when labour markets cannot absorb the mobile labour force.

What can account for the puzzling evolution of disparities at the regional level since the mid-1980s? In some countries, national growth rates are driven by a few growth leaders, metropolitan regions in particular, which results in a rise of regional disparities. Giannetti argues that these differences in regional growth are determined by differences in the regions' ability to exploit technological spillovers.²⁴ The technologically advanced regions predominantly benefit from international knowledge transfers, resulting from increased levels of trade and intra-EU FDI after the mid-1980s. The international exchange of knowledge is less important for traditional industries than for new high-tech industries. Hence, these factors are likely to support convergence only among regions specialised in high-tech sectors. As a result, disparities within countries in which regions are specialised in different sectors might increase. Since the relative contribution made by the technologically advanced regions to the country's total production is rising, disparities across countries decrease.

Tondl and Vuksic found that the level of FDI, as a channel for knowledge spillovers, had a substantial impact on regional growth performances in the acceding countries.²⁵ According to the results a doubling in

¹⁹ J. Bröcker: Schlussfolgerungen aus der Theorie endogenen Wachstums für eine ausgleichende Regionalpolitik, in: *Raumforschung und Raumordnung*, Vol. 60, 2002, pp. 185-194.

²⁰ Cf. J. R. Cuadrado-Roura, *op. cit.*

²¹ D. Ben-David: Equalizing exchange: trade liberalization and income convergence, in: *Quarterly Journal of Economics*, Vol. 108, 1993, pp. 653-79.

²² J. R. Cuadrado-Roura, *op. cit.*

²³ J. Bröcker, *Konvergenz in Europa ...*, *op. cit.*

²⁴ M. Giannetti: The effects of integration on regional disparities: Convergence, divergence or both?, in: *European Economic Review*, Vol. 46, 2002, pp. 539 – 567.

the share of FDI in regional GVA has a six-fold impact on the growth of per capita income, while the share of domestic investment has no significant impact on regional growth. Furthermore, regions next to the borders of Western European countries tend to perform slightly better. The most important determinant of high growth is the fact of being a capital area. Unfavourably located regions with low FDI stocks and low educational levels do not take part in the convergence process. The spatial dependencies of regional growth on the performances of surrounding regions indicate a tendency towards geographical clustering of high growth regions. Tondl concludes that FDI and the intensified diffusion of technology in the course of integration will accelerate the catching-up of Eastern European countries. Moreover, intense trade relations between new and old member states could promote convergence.²⁶

Conclusions

What do the findings of the present analysis imply for future convergence in the EU? Evaluating the prospects of convergence in the EU25 based on recent evidence in the EU15 results in a rather disillusioning perspective. The speed of convergence has significantly declined since the early period of European integration. In the last two decades the convergence rate stayed well below the 2% level, implying that catching-up to the EU average will be a long-term process for the new member states. However, there has been a pronounced decline in disparities between new and old member states since the mid-1990s. The second half of the 1990s was marked by high convergence rates at the national level pointing to a more swift reduction of disparities in the enlarged EU.

Two aspects dampen the latter, more optimistic view. Firstly, convergence in the EU25 in the second half of the 1990s seems to be largely restricted to catching-up processes among countries. There is only weak evidence on convergence among regions in the enlarged EU since 1995. These findings suggest that there is a potential conflict between the objectives of the Cohesion and Structural Funds due to an equity-efficiency dilemma. If the catching-up of the poor new member states at the national level is caused mainly by the dynamic development of relatively prosperous agglomerations, an efficient cohesion policy will hardly be consistent with Objective 1 of the Structural Funds. The first best policy to achieve cohesion could imply a focus on competitive agglomerations and capital regions that have, at least partly, already a GDP per

capita above 75% of the EU average. In contrast, Objective 1 covers measures in the least developed regions with an average income below the 75% level.²⁷

Secondly, the currently high rate of convergence in the enlarged EU might decline during the next decade. Convergence could slow down since growth in Eastern European countries might lose momentum as the income gap decreases. The positive effects of proceeding integration, i.e. of increasing trade and factor mobility, on convergence might diminish. The integration process between new and old member states started already in the early 1990s and gave rise to the rapid growth of trade and FDI between the EU15 and the accession countries. Intensified trade relations and FDI probably made significant contributions to the catching-up process of the acceding countries. However, some experts predict only small additional integration impulses from the accession since in several areas internal market conditions already prevail and only a few of the remaining impediments have been removed with accession in May 2004.²⁸ Thus, the impact of intensified trade relations and FDI on convergence in the EU25 might lose significance.²⁹ The historical evolution of European integration and income disparities suggests that labour mobility is also an important factor with respect to the speed of convergence. Thus, there should be a significant potential to accelerate convergence via labour mobility since migration in the enlarged EU is still low. However, the impact of increased labour mobility on the speed of convergence is at least delayed by the transitional agreements between new and old member states.

The Commission seems to share a more pessimistic view regarding the speed of convergence and the time span necessary to close the considerable income gap between new and old member states. Recent decisions regarding the next EU budget suggest that the Commission seems to favour an increase of funds for regional aid in order to deal with the pronounced disparities in the EU25. Moreover, the outline of future regional policy in the latest cohesion report indicates that there will be no fundamental changes in the policy design taking into account e.g. the equity-efficiency dilemma that seems to mark economic growth in the enlarged EU. In view of the budget controversies, EU

²⁷ Cf. also K. Lammers, *op. cit.*

²⁸ Cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung: Staatsfinanzen konsolidieren – Steuersystem reformieren, Jahresgutachten 2003/04, Wiesbaden; M. Wagner and J. Hloušková: The CEEC10's real convergence prospects, CEPR Discussion Paper No. 3318, London 2002.

²⁹ Tondl, conversely, argues that accession might affect FDI in Eastern European countries positively because of the availability of structural funds. Cf. G. Tondl: Die Konvergenzperspektive Osteuropas ... , *op. cit.*

²⁵ G. Tondl and G. Vuksic, *op. cit.*

²⁶ G. Tondl: Die Konvergenzperspektive Osteuropas, in: Beihefte der Konjunkturpolitik, Vol. 53, 2002, pp. 39-51.

financial support aiming at a reduction of income disparities should focus on the poor new member states. Furthermore, the potential conflict between structural funds and cohesion policy at the European level could be solved by a reallocation of responsibilities. The EU could focus on cohesion by improving conditions for economic growth in the new member states, whereas regional disparities could again become entirely the task of the member states. This model has also been advocated by some net payers and boosted by the Sapir Report.³⁰

However, the financial perspectives and the proposal for the policy design in the period 2006-2013

³⁰ For an overview of different proposals regarding future EU regional policy see J. Bachtler: Reforming EU Cohesion Policy: An Assessment of the Debate, in: INTERECONOMICS, Vol. 38, No. 6, 2003, pp. 302-305; Sapir Report: An Agenda for a Growing Europe – Making The EU Economic System Deliver, Report of an high-level study group, Brussels 2003.

outlined in the third cohesion report point to a future cohesion policy that presents in general a continuation of the current policy approach. The Commission has proposed allocating €336 billion (0.41% of GNI of the EU27) in support of cohesion policy for the period 2006-2013. 78% of these funds are designated for the least developed regions, the cohesion fund and the regions affected by the statistical effect. 18% of the financial resources could be used to support competitiveness and employment outside the aforementioned regions and 4% are reserved for territorial cooperation.³¹ This allotment implies that around 50% of the funds would be allocated to regions in the old member states. So, up to now, there is neither indication of a focus on the poorest areas in the new member states nor signs of the general reform of EU regional policy necessary for an effective policy in the EU25.

³¹ Cf. European Commission: Third Report on Economic and Social Cohesion, op. cit.