



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



DISCUSSION PAPER

Interactions between National and Regional Development

**Sara Davies
Martin Hallet**

HWWA DISCUSSION PAPER

207

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)
Hamburg Institute of International Economics

2002

ISSN 1616-4814

Hamburgisches Welt-Wirtschafts-Archiv (HWWA)
Hamburg Institute of International Economics
Neuer Jungfernstieg 21 - 20347 Hamburg, Germany
Telefon: 040/428 34 355
Telefax: 040/428 34 451
e-mail: hwwa@hwwa.de
Internet: <http://www.hwwa.de>

The HWWA is a member of:

- Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz (WGL)
- Arbeitsgemeinschaft deutscher wirtschaftswissenschaftlicher Forschungsinstitute (ARGE)
- Association d'Instituts Européens de Conjoncture Economique (AIECE)

HWWA Discussion Paper

Interactions between National and Regional Development

Sara Davies and Martin Hallet*

HWWA Discussion Paper 207
<http://www.hwwa.de>

Hamburg Institute of International Economics (HWWA)
Neuer Jungfernstieg 21 - 20347 Hamburg, Germany
e-mail: hwwa@hwwa.de

*Both authors are officials in the European Commission's Directorate General for Economic and Financial Affairs. The views expressed here are not necessarily shared by the institution for which they work. The authors would like to thank Carole Garnier for helpful comments on earlier drafts of this paper.

This is an extended version of a section previously published in European Commission (2000). An earlier version of this paper has been presented at the conference of the Regional Studies Association in Gdansk in September 2001 and in some parts at the conference of the Arbeitskreis Europäische Integration and the HWWA in July 2002.

This paper is assigned to the HWWA's research programme "European Integration and Spatial Development".

Edited by the Department European Integration
Head: Dr. Konrad Lammers

HWWA DISCUSSION PAPER 207
Novembre 2002

Interactions between National and Regional Development

ABSTRACT

Williamson (1965) argued that catching up countries experiencing strong national growth tend also to see a widening in regional disparities, whereas in more developed economies strong national growth and falling regional disparities could go hand in hand. We find some evidence of a trade-off between national growth and regional dispersion in the EU's Cohesion countries, notably in Spain and Ireland. We also find some evidence of spread effects in some richer EU Member States, although no inevitable link between lower regional disparities and stronger national growth. The potential policy implications of this analysis are also examined.

JEL-Classification: O18, R11, R58

Keywords: Cohesion, catching up, growth, EU regions, regional policy

Sara Davies
European Commission's Directorate General
for Economic and Financial Affairs
1049 Bruxelles, Belgium
Telefon: +32-(0)2.299.11.11
Telefax: +32-(0)2.299.61.51
e-mail: Sara.Davies@cec.eu.int

Martin Hallet
European Commission's Directorate General
for Economic and Financial Affairs (GD ECFIN-D-1)
Office: BU1 1/59
1049 Bruxelles, Belgium
Telefon: +32-(0)2.299.34.38
Telefax: +32-(0)2.299.61.51
e-mail: martin.hallet@cec.eu.int

1. INTRODUCTION

The possibility that the catching-up process may be characterised by a trade-off between equity and efficiency is well-known in economics, although it remains controversial. Renewed interest has recently focused on the potential trade-off between national growth and household income disparities, particularly in developing countries¹, but less attention has been paid to possible interactions between national growth and regional disparities. Geographers and development economists have long recognised that the relationship between national and regional development may be non-linear, and this conception has more recently been formalised via theoretical advances in mainstream economics, notably new endogenous growth theory and the new economic geography. An early formulation of the potential trade-off between national and regional development was provided by Williamson (1965), who drew on work by authors such as Kuznets (1955), Myrdal (1957) and Hirschman (1958) to argue that the relationship between national growth and regional disparities typically takes the form of an inverted U curve. This hypothesis is based on the observation that catching-up countries enjoying a high national growth rate often see a widening of regional disparities in terms of per capita income, as national growth tends to be driven by growth pole effects which emerge in capital cities and other major agglomerations. As national growth proceeds, however, regional disparities are hypothesised to fall due *inter alia* to spread effects.

We here examine the applicability of Williamson's (1965) inverted U curve to development processes in the EU-15. First, we set out a theoretical framework for analysing non-linear relationships between national and regional development, drawing on Williamson's hypothesis and recent advances in economic theories. We then examine available empirical data on interactions between national growth and regional disparities, first in the Cohesion countries and then in a number of wealthier Member States. Finally, we consider some policy implications which arise from our analysis. One implication is that the early stages of the catching-up process may be characterised by a potential policy trade-off between national development and regional disparities. A second is that national growth in wealthier countries could be facilitated by a reduction in regional disparities.

¹ See e.g. Barro (2000); Dollar and Kraay (2001); Higgins and Williamson (1999); Li *et al.* (1998).

2. THEORIES OLD AND NEW

While geographers and development economists have long aimed at analysing the reasons for the persistence of income differences across countries and regions, economic theory has until recently been unable to provide an adequate formal explanation of these empirical tendencies. Free trade or factor mobility was expected to exert a tendency towards an equalisation of goods and factor prices. In neo-classical growth theory, the assumption of diminishing marginal returns implied that capital would flow to poorer countries or regions, where returns would be higher. Poorer regions would thus soon catch up with the leading regions, and any trade-off between regional and national convergence would be short-lived. These models were based on assumptions of constant returns to scale and no transport costs, which left little room to explain any differences across space.

However, various new approaches have now been developed via models which relax some of these assumptions. New endogenous growth theories assume that diminishing marginal returns do not apply to all forms of capital, notably human, knowledge or public capital. Similarly, the new economic geography not only drops the assumption of diminishing marginal returns but also introduces trade costs, in order to explore the spatial patterns of growth.

New endogenous growth theories

The assumption that some forms of capital may be subject to increasing returns allows new endogenous growth theories to examine the possibility of permanent developmental differences among economies. For example, Lucas (1988) extends the definition of capital to include human capital, which is seen not to be subject to diminishing returns, and to enhance the productivity of both labour and physical capital. These external effects mean that there are permanent incentives for investment in economies which are rich in human capital, and that investment need not flow to poorer countries in search of higher returns. Levels of income may therefore diverge permanently between countries or regions. Moreover, as the generation of human capital may vary across industries, the principle of comparative advantage can determine, not only what goods and services are produced in which countries, but also the rate of human capital growth of each country – and thus its long run rate of GDP per capita growth. A similar story is provided by Romer (1986, 1990), focusing however on increasing returns to knowledge capital,

which are seen to diminish with distance and state borders. Divergence is, nevertheless, not inevitable as less developed economies may be able to catch up by drawing on existing knowledge, facilitated by trade and modern communications, and as patterns of comparative advantage gradually shift due to the introduction of new goods (Grossman and Helpman, 1990).

New Economic Geography

In the new economic geography, persistent disparities in income between economies are explained as a possible consequence of trade costs and market size, plus either labour mobility or input-output linkages. Together, these mean that industries enjoying increasing returns to scale concentrate in the larger initial market, while the periphery specialises in other industries². One model suggests that “while complete elimination of obstacles to trade always raises the competitiveness of the peripheral regions, partial elimination may in principle have a perverse effect” (Krugman and Venables, 1990 p.58; cf. Puga, 1999). Depending on the periphery’s possibilities for exploiting economies of scale via access to the large core markets, relative wages in the core and periphery will tend to diverge when trade costs are medium-to-high, and to converge when trade costs are medium-to-low. When trade costs are extremely high, manufactured goods are essentially not traded, and firms have to locate their production in the region that they ultimately serve, so that each region produces according to local demand. As trade costs are reduced, the larger core region becomes more attractive, as firms located in the core have larger sales and, because of increasing returns, experience rising profits. The higher profits attract more firms and production to the core, which then becomes a net exporter of manufactured goods to the periphery. At the same time, demand and prices for immobile local factors in the core rise relative to the periphery and, as trade costs fall further, this offsets the attraction of locating in the core. In an extreme case of zero trade costs, the distribution of economic activity is seen to be dictated by factor prices.

² For a summary of the literature, see Fujita *et al.* (1999).

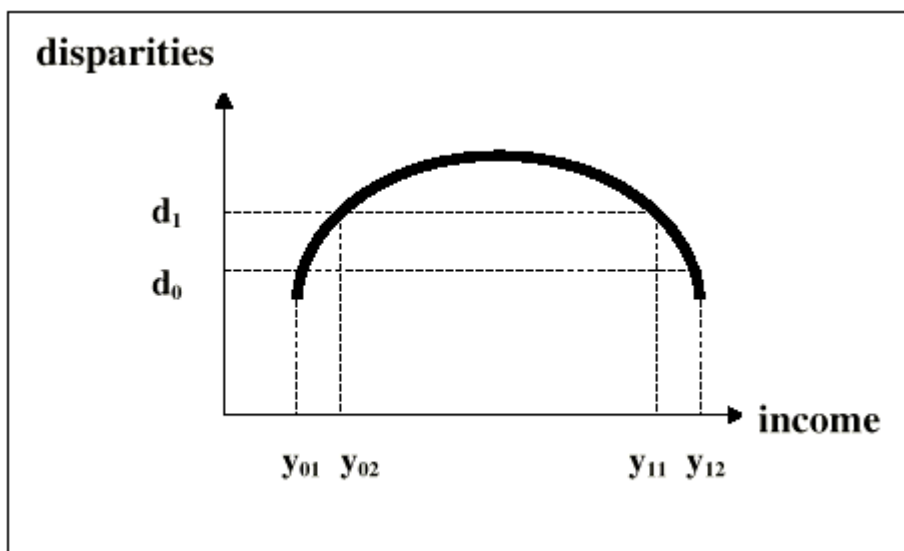
The Williamson hypothesis

These new models all support the hypothesis of a non-linear relationship between national development and regional disparities, which is already well-known in geography and development economics. Williamson (1965) argued that the typical pattern of national development creates regional divergence in the early stages and regional convergence in later stages: "The expected result is that a statistic describing regional inequality will trace out an inverted 'U' over the national growth path" (pp. 9f.). He draws on arguments from development economics, in particular those of Kuznets (1955), Myrdal (1957) and Hirschman (1958) to argue that interregional linkages, factor movements and central government policies interact in favour of the main agglomerations in the early stages of development, while this tendency may be reversed in later stages of development due to a higher aggregate level of income.

In particular, Williamson took up Kuznets' argument that the rise and fall of income inequalities had been an inherent feature of the development path of industrialised countries, and could be embodied in the inverted-U shaped 'Kuznets curve', which describes a rise in income inequalities among households in the early stages of the catching-up process, and a fall in later stages. Williamson gave the inverted-U curve an explicitly spatial dimension and focused, not on household income inequality, but on interregional disparities in per capita income levels, arguing that the catching-up process was typically associated first with a rise and then with a fall in spatial disparities. This inverted U relationship between regional disparities and economic development is illustrated in Figure 1, with d representing regional income dispersion and y national income per capita.

A key argument is that growth in catching-up economies tends to be generated by a limited number of growth poles, which see the emergence of agglomeration economies in the form of knowledge spillovers and economies of scale. Private capital and skilled workers are attracted to the growth pole regions by the proliferation of new opportunities, and this leads to cumulative rises in productivity and growth. By definition, more rapid growth in the growth pole regions (a shift from Y_{01} to Y_{02} in Figure 1) leads to a widening of interregional disparities (a move from d_0 to d_1). In later stages of development, however, diseconomies of agglomeration, such as congestion and high factor costs, may emerge in the growth pole regions. Capital is therefore likely to move to other regions where the level of capital per worker is lower and there is

Figure 1: The Williamson inverted U curve



therefore greater scope for productivity gains due to capital investment, assuming that labour costs are lower. Similarly, the spatial concentration of knowledge spillovers may fall due to technological diffusion, particularly if there are improvements in country-wide communications. Spread effects may also be enhanced by the reallocation of productive factors across sectors. However, these effects are unlikely to benefit all regions equally, with spread effects tending to be strongest in those rural areas which have good access to the urban growth poles.

Policy-makers' decisions – particularly relating to the location of public investment - may also contribute to the rise and fall of regional disparities during the catching-up process. In early stages, public investment tends to be focused on the growth pole regions, either because priority is given to the objective of maximising national growth, or simply due to increased pressure for public infrastructure in the rapidly developing regions (e.g. for transport, communications, water supply, health and education). In later stages, greater political priority may be given to the objective of spatial equity, so that public investment is directed to lagging regions. This policy shift may be stimulated by the need to reduce diseconomies of agglomeration in the original growth pole regions, as well as by the perceived desirability of providing the necessary conditions, such as public and human capital, for attracting private investment to other regions.

Williamson presents some cross-sectional and historical data to support his hypothesis which has, however, been subject to criticism on both theoretical and empirical grounds

(cf. Richardson, 1978). A key weakness is the blurring of positive and normative aspects, as policy intervention is seen as one of the mechanisms generating the inverted-U curve – yet the trade-off between equity and efficiency is also seen as an empirical regularity which requires specific forms of policy intervention. Nevertheless, a trade-off between regional equity and aggregate efficiency can often be observed in the early stages of the catching up process, with this trade-off tending to diminish in importance as development proceeds.

A simple illustration

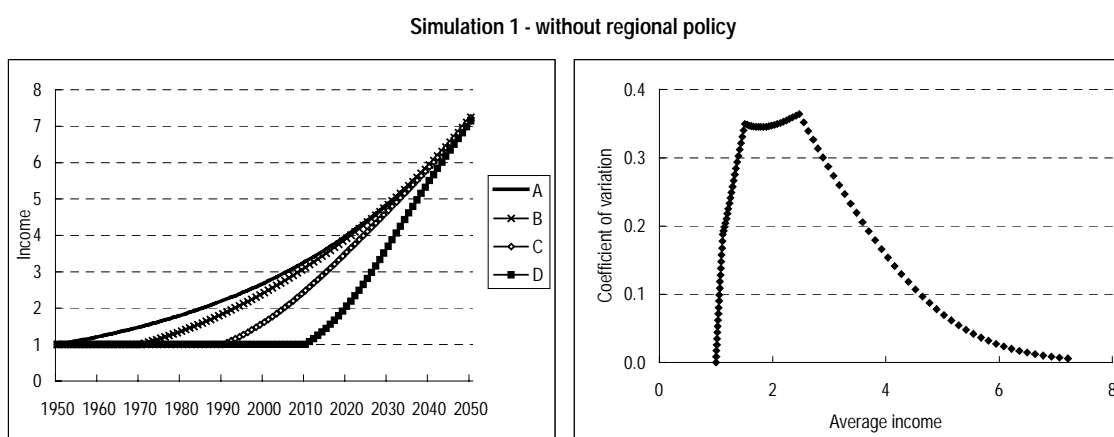
Lucas (2000) sets out a simple growth model in order to run a numerical simulation illustrating the long-run dynamics of world income growth and inequality. A simplified version of this model can also be used to illustrate the basic arguments of the policy trade-off between national and regional convergence. Figures 2 and 3 give the detailed results, while the model itself is described in the Annex.

The model depends on 2 key sets of assumptions. The first is that the later a country starts to grow, the faster its initial growth rate, as this is assumed to depend on the extent to which its income level lags behind that of the first-mover. Lucas calls this higher growth rate the “late entrant bonus”. As the country’s income level rises, its growth rate starts falling until it approaches the annual growth rate of the first mover. The second set of assumptions relates to the probability that growth will start in a country, as spillover effects are seen to mean that a rise in the world income level increases the likelihood that non-growing economies will take off. These spillover effects may be explained in terms of the neoclassical model of long-run growth (where the assumption of diminishing marginal returns to capital generates convergence in levels of income per capita), or in terms of the external effects of human capital, or the diffusion of institutional and policy best-practice.

The simulations are based on an economy with 4 regions A, B, C and D, each with an income of 1 unit. In 1951, region A (which can be thought of as the capital city region) takes off with a growth rate of 2%. Regions B, C and D subsequently start catching up - region B in 1971, region C in 1991 and region D in 2011. Each catching up region is assumed to have a growth rate of 2% plus a factor β ($=0.025$) times the income gap to region A in each preceding year. By 2050, all regions have reached region A’s level of income (see Figure 2a). Taking the coefficient of variation as a measure of regional

income inequality, it peaks at a value of 0.4 in 2010 at an average income of 2.5 units (see Figure 2b).

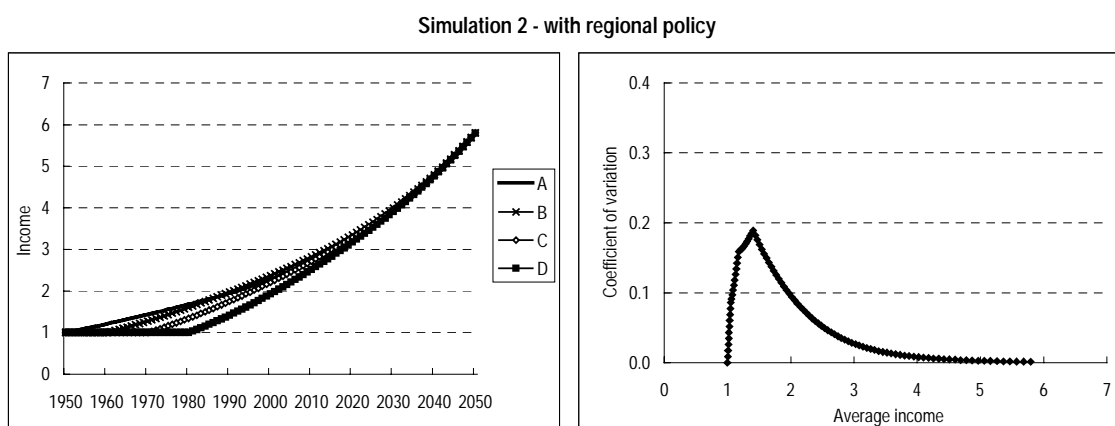
Figure 2



Source: Own calculations.

Now let us assume that this level of income inequality is seen as unacceptable. Region A is therefore ‘taxed’ by a factor τ ($=0.02$) times the standard deviation of each preceding year in order to contribute to the development of the other 3 regions. This ‘tax’ could be interpreted as foregone investment in infrastructure which would have reduced congestion and allowed for higher growth in region A. As a consequence of these regional policy efforts, the other regions take off earlier than before - region B in 1961, region C in 1971 and region D in 1981. They have the same growth rates as described above i.e. 2% plus a factor relative to the income gap compared to region A. In 2050, all regions have an income of 5.8 units, while the coefficient of variation peaks in 1980 at a value of about 0.2 (see Figures 3a and 3b). Due to the assumption that only region A is ‘taxed’, its income is lower than that of region B after 1988, and that of region C after 2009.

Figure 3



A comparison of the 2 simulations shows that the long-run income of all regions is higher in the first simulation (by 1.4 units in 2050) while, in the short to medium run, income inequality is much lower in simulation 2. Average income in the middle of the period – in the year 2000 - is higher in simulation 2 than in simulation 1 (2.2 units compared to 1.9). In 2000, region A is worse off in simulation 2 (with an income of 2.3, compared to 2.7 in simulation 1), whereas regions C and D are better off. Region B's income in 2000 is about the same in the two simulations. After 2032, the income of all regions is higher in simulation 1 than in simulation 2. The differences in terms of growth between the two simulations arise not only from the 'taxation' of region A to finance regional policy intervention, but also from the consequent lower growth of region A, which means that the level of spillover effects for the other 3 regions is lower due to the reduced level of the 'late entrant bonus'. Thus, lower regional disparities are achieved at the expense of long-term growth.

Although some of the assumptions on which this exercise is based may be questioned (e.g. relating to the 'late entrant bonus' and the taxation only of region A), it nevertheless illustrates the possibility of a trade-off between more rapid national growth and lower regional disparities in catching up economies.

Implications for policy-makers

A normative interpretation of the Williamson hypothesis implies that policy-makers in low income countries may face a dilemma as it may not be possible to achieve

simultaneously the 2 policy objectives of strong national growth and regional equity in the early stages of catching up. This situation seems relatively plausible as poorer countries, confronted with high levels of need and scarce means, often prefer to promote national development and to create favourable conditions for private investment by concentrating public investment on a few growth poles, rather than spreading a low level of assistance over the whole country and thus reducing the country's relative attractiveness to private investment. In contrast, national growth in richer countries might contribute to regional convergence or might even become constrained by high factor prices and congestion in agglomerations. Thus policy intervention aimed at reducing regional disparities might allow for a higher level of aggregate income.

The tension between the policy objectives of national growth and regional equity has been explored empirically by de la Fuente (1996, pp.17ff.), who simulates the efficiency/equity trade-off for Spain in 1981-90 on the basis of an estimated production function including public investment. He shows that an extremely redistributive policy of public investment would have reduced regional disparities by 13.54% compared to the baseline, at the expense of a 1.62% decrease in national GDP. The alternative extreme of a policy oriented solely towards efficiency, and allocating public investment according to profitability, would have increased GDP by 1.58% and regional disparities by 18.29%.

Nevertheless, some critical remarks should be noted in relation to any normative interpretation of the Williamson hypothesis. One reason for the inverted U shaped curve is that central government policies in early phases of catching-up are assumed to be oriented towards the main agglomerations - yet a normative interpretation of the curve simply provides an ex-post justification for these policies. Furthermore, not all regional policy projects can be classified as benefiting either the centre alone, or the periphery alone as many types of investment, for example in human capital, may benefit both types of regions. Finally, there is a need for some scepticism on the capacity of regional policy to direct the process of regional development, not least because policy intervention may be outweighed by other regional location factors, such as peripherality, which policy can only affect to a limited extent.

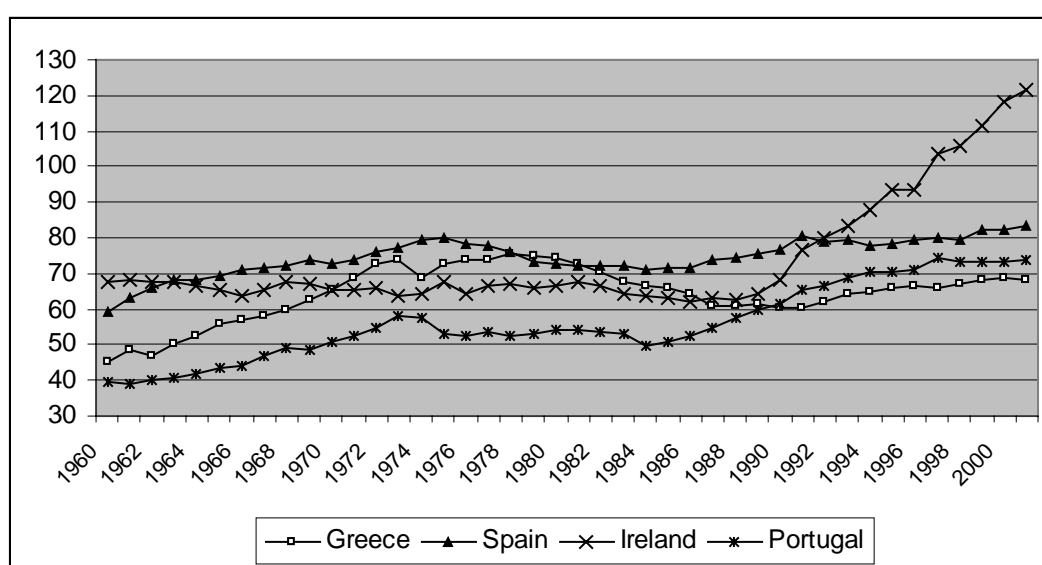
3. EMPIRICAL EVIDENCE FROM THE EU-15

There are 2 major obstacles to the analysis of empirical evidence in the EU-15 on the Williamson hypothesis. First, theory suggests that the relationship between national and regional development is not linear. This implies that empirical methodologies, such as linear regressions, which search for linear relationships, will produce rather unclear results (cf. Baldwin and Sbergami, 2000). Second, although the availability of comparable data for EU-15 regions has improved in recent years, there is a lack of consistent long-run regional time-series data across the EU-15, so that analyses can only draw on data-sets on GVA, population and employment. There are, however, problems even in these areas, as some Member States only have regional data for limited time-periods, while in others there are significant breaks in the data series, not least due to the recent introduction of the new European System of Accounts (ESA95). A further problem relates to the definition of regions, because consistent data across all EU-15 regions is provided only by Eurostat in the context of the EU-15 classification of NUTS 1, NUTS 2 and NUTS 3 regions (ranging from larger to smaller), which are used for the allocation of Structural Funds finance. In general, NUTS 1 and NUTS 2 data are available for a longer time-scale than NUTS 3 data. However, NUTS 2 regions are sometimes rather artificial and do not always reflect the realities of economic linkages. On the other hand, the very small scale of the NUTS 3 regions means that the concept of convergence may not always be meaningful, as the diversity of population and economic activities at such a disaggregated level means that some degree of disparity across regions is inevitable. In statistical terms, levels of disparities (measured, for example, in terms of coefficients of variation) almost invariably increase at more disaggregated levels. It is thus far from evident which spatial level is the most appropriate for analysing real convergence. For these reasons, this section is exclusively based on descriptive methods.

Although there is potentially a wide range of statistical indicators of dispersion, most recent studies on real convergence follow Barro and Sala-i-Martin's (1995) methodology of regression analysis. This literature provides clear evidence of national convergence among the EU-15's Member States since the 1960s, particularly due to the Cohesion countries catching up with the EU-15 average level of GDP per capita (European Commission, 1997, 2000). At the regional level, however, the results of studies are more ambiguous (Boldrin and Canova, 2001). There is some evidence of convergence at the level of all the EU-15's regions, but the trend is not strong, and is weakened if studies control for country fixed effects (Martin, 1998; Neven and

Gouyette, 1995; Sala-i-Martin, 1996). Moreover, this aggregate analysis may conceal a variety of different processes. It has been argued, for example, that different groups or ‘convergence clubs’ of relatively richer and poorer regions are emerging, so that apparent regional convergence is simply generated by the richer regions of the Cohesion countries catching up with the EU-15 average (Quah, 1996).

Figure 4: National GDP per capita (PPS) in the Cohesion countries, EU15 = 100, 1960-2001



Source: European Commission.

Relatively few studies have examined interactions between processes of national and regional development. Quah (1999) analyses regional and national convergence in 3 of the Cohesion countries - Greece, Portugal and Spain - in 1980-89. He uses models of explicit distribution dynamics to examine the evolution of per capita income in the entire cross-section distribution of a group of economies. This contrasts with the approach of regression analysis, which focuses on the average behaviour of a group of regions or countries. The study shows that Greece had the lowest national growth rate in the EU-15 and also experienced an increase in regional convergence (cf. Petrakos and Saratis, 2000). Portugal and Spain saw higher rates of growth in GDP per capita, with both countries also experiencing a rise in regional divergence. Regional disparities grew only modestly in Spain, as a number of regions with average levels of GDP per capita converged towards the richer regions. In Portugal, however, which started from a lower overall level of GDP per capita, regional disparities grew more strongly as a small

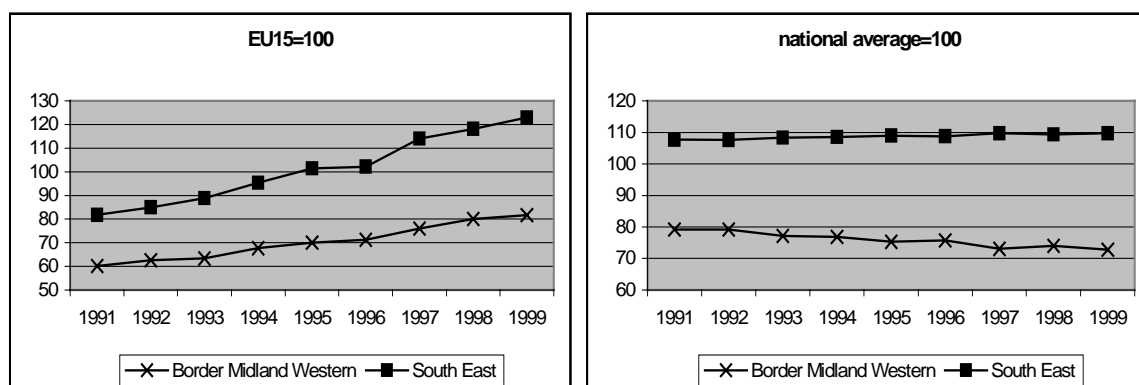
number of regions grew rapidly, driving both the national growth process and the increase in regional divergence.

National catching-up – the ascending side of the Williamson curve

Our analysis also provides some evidence of a trade-off between national and regional convergence in the Cohesion countries. Despite differences in the evolution of national growth paths and interregional disparities in the 1980s-90s, there appears to be some correlation between high growth rates and a rise in regional disparities, particularly in the 1990s. Ireland and Spain have seen higher growth rates and a widening of regional disparities. Greece experienced a low growth rate and low/ falling regional dispersion in the 1980s and early 1990s – yet even since the take-off of national growth since 1996, regional disparities do not seem to have increased. The data for Portugal are rather contradictory, as data from ESA79 and ESA95 show quite different trends since the mid 1990s.

Ireland provides a good illustration of growth pole effects as the strong national growth rate in the 1990s was driven by the particularly rapid growth of the eastern and southern regions, particularly Dublin and the surrounding area, which has accounted for a growing share of national gross value added (GVA) (see Table 1). Although the higher growth rates of these regions have led to a widening of regional disparities within Ireland, all regions converged towards the EU-15 average level of GVA per capita in 1991-99.

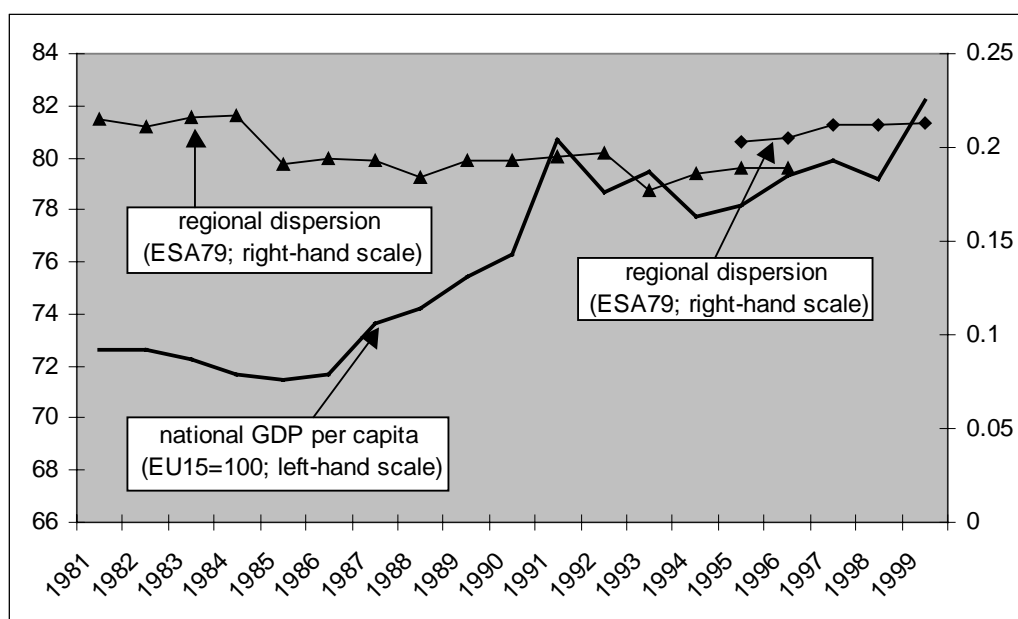
Figure 5: Regional GVA per capita in Ireland in the regions of Border/Midland/Western and of South East, 1991-99



Source: Ireland's National Statistical Office

Spain also demonstrates the potential impact of growth pole effects on both national growth rates and regional disparities, although less dramatically than Ireland does. Spain's national growth path in 1980-99 was driven by the particularly rapid growth of some of the regions with the highest levels of per capita income, particularly Madrid and Cataluña. Although regional dispersion fell in the mid 1980s and remained rather static until the early 1990s, since around 1993 there has been a gradual rise in regional disparities within Spain. Despite this, all Spanish regions except Asturias and Cantabria (which were however above the Spanish average at the beginning of this period) converged towards the EU-15 average level of GDP per capita in PPS. Although the strongest growth was in some of the richest regions, notably Madrid and Catalunya, the performance of other regions was variable, with some poor regions (such as Extremadura) catching up and other richer regions (such as Pais Vasco and La Rioja) showing only slow growth.

Figure 6: Spain's national growth and regional dispersion, 1980-99



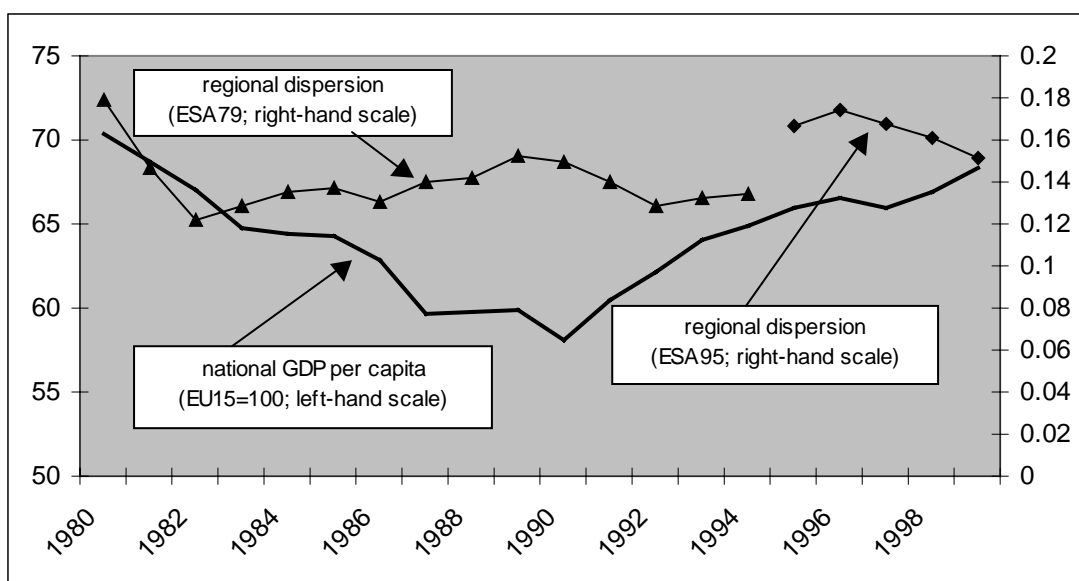
Note: Regional dispersion is measured by the coefficient of variation of regional gross value added per capita.

Source: Eurostat, own calculations.

The situation of Greece is rather different. Average national growth in per capita income was only 0.2% in 1980-94, so that Greece diverged from the rest of the EU-15. This very low growth rate was due primarily to the lack of growth in the major

agglomerations of Athens and Thessaloniki, as well as the decline of industry in the region of Sterea Ellada - with the latter diverging from the EU average level of GDP per capita in PPS. Two other regions (Ipeiros and Peloponisos) also diverged from the EU average in this period, while the most rapid growth was seen in some of the island regions which had previously been relatively poor. These developments tended to lead to a low level of interregional disparities. It is only since 1996 that Greece has started converging steadily towards the EU average yet it is notable that, although the region of Thessaloniki (Kentriki Makedonia) has seen above-average growth since the mid 1990s, the region of Athens (Attiki) has only grown very slowly. This may be a matter of some concern, as Attiki accounted for 37% of Greece's GVA in 1999 (while Kentriki Makedonia accounted for a further 17%) and it is difficult to see how Greece's national growth can remain strong unless it is fuelled by the two main growth poles.

Figure 7: Greece's national growth and regional dispersion, 1980-99



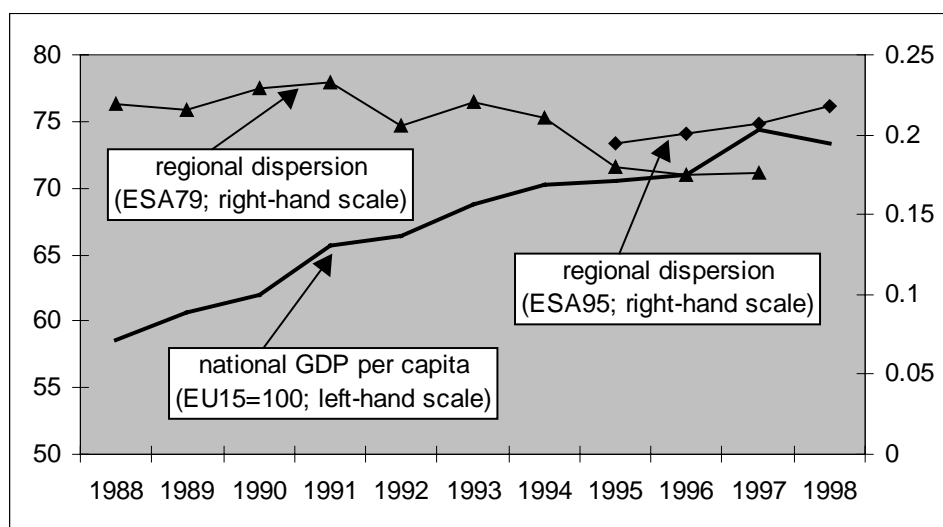
Note: Regional dispersion is measured by the coefficient of variation of regional gross value added per capita.

Source: Eurostat, own calculations.

Data for Portugal show the most rapid growth in the capital city region of Lisboa and Vale do Tejo in 1988-99, although some poorer regions also grew relatively quickly, particularly Centro, Madeira and, since the mid 1990s, the Açores. As Figure 8 shows, however, there is some inconsistency in the data as the two data-sets ESA79 and ESA95 show different trends for the overlapping years of 1995-97. The ESA79 data show a fall

in regional dispersion, while the ESA95 data show divergence. Both sets of data, however, show that all regions converged towards the EU average of GDP per capita in the 1980s-90s, with the exception of Alentejo, which (according to the ESA79 data) grew rather slowly in 1988-96, and (according to the ESA95 data) diverged in 1995-98.

Figure 8: Portugal's national growth and regional dispersion, 1980-99



Note: Regional dispersion is measured by the coefficient of variation of regional gross value added per capita.

Source: Eurostat, own calculations.

Regional convergence - the descending side of the Williamson curve

Our analysis focuses on three of the largest and wealthier Member States in the EU-15, namely Germany, Italy and the UK. In Germany the main regional divide dates back only to reunification, as disparities between and within the western *Länder* are relatively limited. In Italy, by contrast, there has been no significant change in the pattern of regional divergence since the early 1970s. Finally, in the UK, economic activities and population are highly concentrated in the south-eastern regions. On the basis of these 3 case studies, we find no clear link between national growth and lower regional disparities in wealthier Member States. The 'descending' side of the Williamson curve appears to be far from automatic and to be strongly affected, for example, by the

specific institutional features of individual countries, including the prevalence of proactive regional policy.

The example of West Germany appears to provide some support for the Williamson hypothesis. Industrialisation in the late 19th century led to some spatial polarisation, notably due to the rise of the *Ruhrgebiet* based on coal and steel production, and the falling behind of more agricultural regions, particularly in the South and East. While regional disparities have fallen significantly since World War II, this has been the outcome of a wide range of political and economic factors.

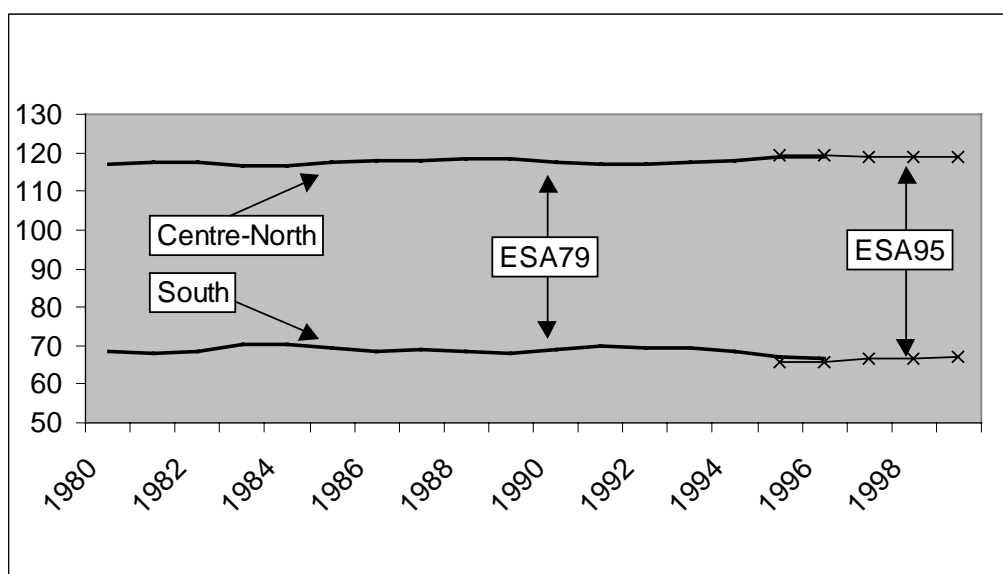
A key reason for the fall in regional disparities is that the southern regions have experienced catching up in the second half of the 20th century. These regions have gained from major structural adjustments in the German economy which have, in contrast, had negative effects in some northern and central regions with the decline of heavy industries. The previously less industrialised South emerged as the most dynamic part of the national economy, particularly in the 1970s-80s, with development based not least on relatively small engineering firms. The rapid development of the South may in part have been stimulated by the brain drain of entrepreneurs and employees from East Germany to southern regions of West Germany in the post-war years. Furthermore, the national institutional framework established following the war was deliberately decentralised, allocating governmental departments and universities across major cities, and leading to the development of a multi-polar urban system, which has since been reinforced by the spatial planning concept of ‘decentralised concentration’ (BBR, 2000). Moreover, the Basic Law sets out the explicit aim of equalising economic differences across the territory. A complex fiscal equalisation scheme has thus evolved between tiers of government and is complemented by a set of regional policy instruments (‘Common Task’).

In contrast to this North-South shift of wealth at a broad regional level, the post-war period has also seen a decline in disparities at a more disaggregated spatial level in West Germany. The observed phenomenon is often referred to as ‘suburbanisation’, whereby firms and people leave the agglomerations and move to the urban fringes and adjacent peripheral regions. This tendency has been ongoing since the 1960s (Bade *et al*, 2000). As a consequence, the divide between urban and rural areas is less clear-cut, although many peripherally located areas still lag behind in terms of economic development.

The early stages of Italy’s development also seem to reflect the ‘ascending’ part of the Williamson curve, although there is less evidence of subsequent regional convergence.

Industrial development from the end of the 19th century was located mainly in the North-West, and this trend continued in the 1950s, driving national growth and opening up wider regional disparities in per capita income. In the 1960s, however, other regions grew more rapidly than the North-West, and even the South achieved some convergence, with GDP per capita rising from 52% of the Centre-North level in 1960, to 64% in 1973, due to a combination of productivity gains and increased migration. The North-East and Centre continued to converge towards the North-West's level of GDP per capita in the 1970s-90s, but the South stagnated, with GDP per capita remaining at around two thirds of the national average.

Figure 9: Italy's regional disparities in GVA per capita (national average=100), 1980-99



Source: Eurostat, own calculations.

The lack of catching-up on the part of Southern Italy since the early 1970s is a consequence of a number of institutional features, which have reduced incentives to private investment in the South, and to labour mobility from South to Centre-North. Investors have been deterred by the rise in the South's unit labour costs following the introduction of centralised wage bargaining mechanisms, as well as by inefficient public services in areas such as water, energy supply and transport, and by the lack of secure property rights. Labour mobility has also been deterred by nominal wage convergence, as well as by higher living costs in the Centre-North, rising welfare payments (particularly pensions) to the South, and rigidities in the housing and labour markets.

Moreover, regional policy has focused too strongly on raising household and public consumption in the South, rather than investing in human and physical capital with the aim of promoting long run growth (European Commission, 1993).

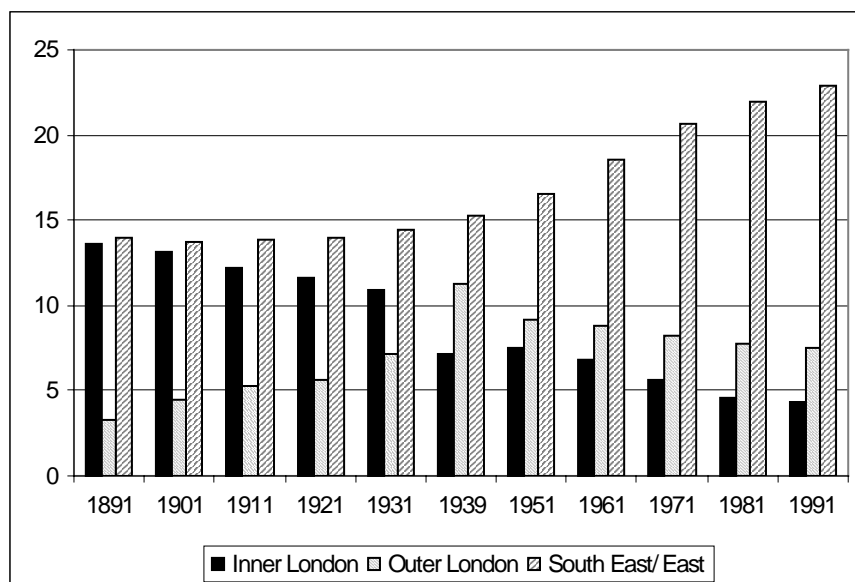
Data do not permit an analysis of ‘suburbanisation’ effects at a disaggregated regional level in Italy. However, among the few NUTS 2 regions seeing a significant rise in population density in the 1930s-90s were Campania, Lazio and Lombardia – home to the major cities of Napoli, Roma and Milano – while regions with large rural areas (such as Abruzzo, Basilicata, Marche and Umbria) saw much more limited population increases. Thus regional concentration increased in population terms in this period, when measured at the NUTS 2 level, with population growth particularly strong in Lazio, the capital city region.

Finally, the UK also provides some evidence of the rise and fall in regional disparities over the national development process. Industrialisation in the nineteenth century led to a concentration of population and economic activities, opening up a more acute divide between rural and industrial/urban areas. London remained by far the largest city, with its population estimated to have grown from one million (or 10% of the population of England and Wales) in 1800, to 6.5 million (or 20% of the population) by 1900³. The urbanisation trend continued in the early decades of the 20th century. However, some industrial areas in northern England, Scotland and Wales were already experiencing structural change by the mid 1920s, a process which continued throughout much of the 20th century.

Urbanisation has, however, decreased since the 1950s, with population and economic activities tending to move out of the major cities, although mainly to nearby areas, with the strongest population rises in the non-metropolitan areas of the South-East. This shift may have been facilitated by policy measures in the 1940s-70s, aimed at achieving a more balanced pattern of spatial development. Measures included public investment in transport to facilitate daily commuting to cities; the creation of ‘new towns’ and development areas in the south-east outside London; and attempts to attract industry to regions undergoing structural change.

³ Due to the lack of long-run data on regional income, the focus here is mainly on population changes.

Figure 10: Percentage of British population in South-eastern England, 1891-1991



Source: UK's National Statistical Office.

Nevertheless, the UK's economy remains highly centralised, with London and the South-east accounting for 35% of the population and 40% of national GDP. Interregional per capita income disparities remain, although these are mitigated to some extent by national redistributive mechanisms (particularly when significant differences in the cost of living are taken into account). However, although GDP per capita in London is far higher than in any other region (at an estimated 150% of the EU-15 average in 1999), levels of GDP per capita in most other NUTS 1 regions are above 90% of the EU average – the only exceptions being the North East (79%), Northern Ireland (80%) and Wales (83%).

The strong degree of concentration in the UK may, however, generate a number of economic problems. First, resources may not be allocated optimally across space because the costs associated with congestion and pollution are not internalised by economic actors. Second, public services may deteriorate in the concentrated region, due to difficulties in recruiting public sector workers (despite additional wage allowances). Finally, spatial differences in a country's sectoral structure can create problems for policy-makers, for example if manufacturing exports and investment slow in the lagging regions, while household consumption and property prices are growing rapidly in the agglomeration regions.

4. CONCLUSIONS

The results of this analysis provide a mixed picture of the usefulness of the Williamson hypothesis in explaining patterns of national and regional development in the EU-15. There is some evidence in favour of the 'ascending' side of the Williamson curve, as catching up does indeed tend to be driven by a small number of growth poles, while other regions lag behind, thus leading, almost inevitably, to an increase in regional disparities. However, the evidence in favour of the 'descending' side of the curve is rather weak, with reductions in regional inequalities in later phases of development depending *inter alia* on institutional aspects, including the degree of emphasis placed on proactive regional policy.

From a policy perspective, 2 sets of interesting questions emerge. The first relates to the balance which needs to be struck between the 2 goals of national growth and regional development in the early phases of catching-up. Our analysis suggests that policy-makers in such countries should be aware of the potential trade-off between these 2 aims and, specifically, that too strong an emphasis on diffusing public investment in order to minimise regional disparities in the early stages of catching up may have the effect of limiting the expansion of growth poles and thus reducing national growth rates.

In the context of the EU-15, this analysis is of particular relevance to the Cohesion countries, as some of them may have been too quick to focus their efforts on regional policy interventions. If such a policy shift has restricted growth in their major agglomerations, it may have limited national catching up towards EU-15 average levels of GDP per capita. This may particularly be the case in Spain, where public investment has been dispersed relatively widely, and also in Portugal in recent years, whereas public investment in Ireland has until recently been strongly focused on contributing to national catching up. In Greece, however, low growth in the major agglomerations in the 1980s and early 1990s was mainly due to macroeconomic instability, as public investment has, until relatively recently, been focused on facilitating national growth.

Our analysis is also of relevance to the Accession countries of Central Europe, where levels of national GDP per capita are well below the EU-15 average and where regional disparities within each country are often considerable. Public investment will remain limited for some time, even once these countries are able to benefit fully from the Structural and Cohesion Funds. Policy-makers will therefore have to make difficult

decisions on the spatial allocation of funds and on the overall design of economic development strategies. Although equity considerations may require some policy emphasis on equal regional development, policy-makers in these countries should be aware of the potential trade-off between national and regional growth. This may mean that the national development strategy should be prioritised in the early stages of catching up, when the largest share of public investment should be focused on the most efficient projects many of which tend to be located in the national growth poles.

A second set of questions relates to the possible correlation between falling regional disparities and stronger national growth at some stage in the development of wealthier countries. Our analysis finds evidence of some degree of spread effects in all 3 countries examined, although these effects do not benefit all non-agglomeration regions equally. However, this process is far from automatic, as shown by the example of Italy, where the spread of growth to the South has been hindered, for example, by disproportionately high labour costs in the lagging regions, by poor quality public services, and by the lack of adequate human capital.

One question raised by our analysis is whether growth in some wealthier EU-15 Member States may be constrained by their over-reliance on their growth pole regions, where agglomeration problems may be acute. Such concerns are voiced at times in Italy, where regional disparities are considerable and where wealthier regions bear the burden of financing relatively high levels of household and public consumption throughout all regions. This concern is also sometimes expressed in the UK, where the recent establishment of development agencies in the English regions was seen as a means of raising growth outside the South East and thus of enhancing the national growth rate.

There is a certain tension here, however, as recent theoretical and empirical analyses from a range of analytical perspectives underscore the continued benefits of agglomeration in terms of economic growth (cf. contributions to CLARK et al., 2000). In some wealthier EU-15 Member States, notably France and the UK, economic activities are strongly concentrated in the regions surrounding the capital cities. The dynamism of such regions contributes significantly to national growth, while the main argument against agglomeration in terms of economic efficiency is that it may generate various negative externalities, particularly congestion and pollution. In policy terms, it might therefore be desirable to introduce measures aimed at enhancing the internalisation of such diseconomies, which might create incentives for a more efficient allocation of resources across space. In practice, however, it has proved difficult to design and

implement measures which effectively internalise these agglomeration diseconomies. One apparently positive example is provided by the Norwegian city of Trondheim, where tolls were introduced in 1991 for car drivers entering the city centre, with toll fees used to finance improvements in public transport and the environment. Although this initiative appears to have reduced traffic intensity, its long term effects on the spatial distribution of economic activities have yet to be studied.

Moreover, although concentration means that there are significant disparities in the spatial distribution of economic activities, the implications in terms of equity are far from clear-cut. In the UK, for example, very long run trends have led to a strong concentration of both population and economic activities in London and the South-East, so that statistical measures of dispersion show only relatively limited interregional disparities in per capita income. Furthermore, governments in wealthier countries are more able to pursue policies aimed at reducing interpersonal income disparities, particularly via the tax-benefit system and the nation-wide provision of public goods.

If more equal patterns of regional development are seen as desirable, either on efficiency or on equity grounds, a further option for policy-makers in wealthier countries may be to direct public investment in basic infrastructure and human capital towards lagging regions. Such measures should enhance the context for private investment in these regions by improving market access and raising productivity, and may thus foster a greater dispersion of productive activities. However, the practicability of such forms of intervention may be reduced by potential pressures on policy-makers in highly concentrated economies to direct public investment to the growing regions, in order to reduce bottlenecks such as inadequate transport infrastructure and lack of skilled labour.

In conclusion, although the empirical evidence on the validity of the WILLIAMSON hypothesis is far from overwhelming, particularly in regard to the 'descending' part of the inverted U curve, an analysis of national and regional development in the EU-15 based on this hypothesis raises some interesting questions. From a normative point of view, these questions relate to the opportunities for policy-makers to facilitate stronger national growth by focusing public investment on growth poles in the early stages of catching up, and by encouraging a more dispersed pattern of economic development in later stages. Clearly, more detailed studies of each individual case would be needed before any definite policy conclusions could be drawn.

ANNEX

Simulation 1 – The Lucas trade off without regional policy

$$y_t^A = y_{t-1}^A (1 + \alpha)$$

$$y_t^B = y_{t-1}^B [1 + \alpha + \beta(y_{t-1}^B - y_{t-1}^A)]$$

$$y_t^C = y_{t-1}^C [1 + \alpha + \beta(y_{t-1}^C - y_{t-1}^A)]$$

$$y_t^D = y_{t-1}^D [1 + \alpha + \beta(y_{t-1}^D - y_{t-1}^A)]$$

y = income

A, B, C, D = regions

t = time (> 1950 for A, > 1970 for B, > 1990 for C, > 2010 for D)

$\alpha = 0.02$

$\beta = 0.025$

Simulation 2 – The Lucas trade off with regional policy

$$y_t^A = y_{t-1}^A [1 + \alpha - \tau \sigma_{t-1}]$$

y_t^B, y_t^C, y_t^D as in simulation 1

$$\sigma_t = \sqrt{\frac{\sum (y_t^i - \bar{y}_t)^2}{4}}$$

$\tau = 0.02$

i = A, B, C, D

t = time (> 1950 for A, > 1960)

REFERENCES

BBR (BUNDESAMT FÜR BAUWESEN UND RAUMORDNUNG) (2000) *Raumordnungsbericht 2000*, Bonn.

BADE F.-J., NIEBUHR A. and SCHÖNERT M. (2000) Spatial structural change – evidence and prospects, Discussion Paper No.87, Hamburg Institute of International Economics.

BALDWIN R.E. and SBERGAMI F. (2000) *Non-linearity in openness and growth links*. Paper to European Trade Study Group Conference, Glasgow, September 15-17.

BARRO R.J. (2000) Inequality and growth in a panel of countries, *Journal of Economic Growth*, **5**, 5-32.

BARRO R.J. and SALA-Í-MARTIN X.X. (1995) *Economic Growth*, MIT Press, Cambridge (MA).

BOLDRIN M. and CANOVA F. (2001) Europe's regions: income disparities and regional policies, *Economic Policy*, **16**, 206-253.

CLARK G.L., FELDMAN M.P. and GERTLER M.S. (2000) *The Oxford Handbook of Economic Geography*, Oxford University Press, Oxford.

DE LA FUENTE A. (1996) Inversión pública y redistribución regional: el caso de España en la década de los ochenta, Working Paper 50/96, University of Barcelona.

DOLLAR D. and KRAAY A (2001) Growth is good for the poor, Working Paper, World Bank (forthcoming).

EUROPEAN COMMISSION (1993) *The Economic and Financial Situation in Italy*, Office for Official Publications of the European Communities, Luxembourg (=European Economy No.1).

EUROPEAN COMMISSION (1997) Regional Growth and Convergence, in: *The Single Market Review, Sub-series VI Aggregate and Regional Impact*, Vol.1, Office for Official Publications of the European Communities, Luxembourg.

EUROPEAN COMMISSION (2000) Real convergence and catching up in the EU, in EUROPEAN COMMISSION *The EU Economy: 2000 Review*, pp. 175-206. Office for

Official Publications of the European Communities, Luxembourg (=European Economy No.71).

FUJITA M., KRUGMAN P. and VENABLES A.J. (1999) *The Spatial Economy – Cities, Regions and International Trade*, MIT Press, Cambridge (MA).

GROSSMAN G.M. and HELPMAN E. (1990) The 'new' growth theory: trade, innovation and growth, *AEA Papers and Proceedings* **80**, 86-91.

HIGGINS M. and WILLIAMSON J.G. (1999) *Explaining inequality the world round: cohort size, Kuznets curves, and openness*, Working Paper No.7224, National Bureau for Economic Research.

HIRSCHMAN A.O. (1958) *The Strategy of Economic Development*, Yale University Press, New Haven / New York.

KRUGMAN P.R. and VENABLES A.J. (1990) Integration and the Competitiveness of Peripheral Industry, in BLISS C. and BRAGA DE MACEDO J. (Eds) *Unity with Diversity in the European Economy: The Community's Southern Frontier*, pp.56-75. Cambridge University Press, Cambridge.

KUZNETS S. (1955) Economic growth and income inequality, *The American Economic Review* **XLV**, 1-28.

LI H., SQUIRE L. and ZOU H. (1998) Explaining international and intertemporal variations in income inequality, in: *The Economic Journal*, **108**, 26-43.

LUCAS R.E. (1988) On the mechanics of economic development, *Journal of Monetary Economics* **22**, 4-42.

LUCAS R.E. (2000) Some macroeconomics for the 21st Century, *Journal of Economic Perspectives* **14**, 159-168.

MARTIN P. (1998): *Public Policies, Regional Inequalities and Growth*, Discussion Paper No.1841, Centre for Economic Policy Research.

MYRDAL G. (1957) *Economic Theory and Under-Developed Regions*, Methuen, London.

- NEVEN D. and Gouyette C. (1995) Regional convergence in the European Community, *Journal of Common Market Studies* **33**, 47-65.
- PETRAKOS G. and SARATIS Y. (2000) Regional inequalities in Greece, *Papers in Regional Science*, Vol.79, pp.57-74.
- PUGA D. (1999) The rise and fall of regional disparities, *European Economic Review*, **43**, 303-334.
- QUAH D. (1996) Regional convergence clusters across Europe, *European Economic Review*, **40**, 951-958.
- QUAH D. (1999) Models of explicit distribution dynamics, in EUROPEAN COMMISSION *The Socio-Economic Impact of Projects Financed by the Cohesion Fund: A modelling approach*, pp. 79-219. Office for Official Publications of the European Communities, Luxembourg.
- RICHARDSON H.W. (1978) The state of regional economics, *International Regional Science Review*, **3**, 1-48.
- ROMER P.M. (1986) Increasing returns and long-run growth, *Journal of Political Economy*, **94**, 1002-1037.
- ROMER P.M. (1990) Endogenous technological change, *Journal of Political Economy* **98**, 71-102.
- SALA-Í-MARTIN X.X. (1996) Regional cohesion: evidence and theories of regional growth and convergence, *European Economic Review*, **40**, 1325-1352.
- WILLIAMSON J.G. (1965) Regional inequality and the process of national development: a description of the patterns, *Economic and Cultural Change*, **13**, 1-84.