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The modern regional policy paradigm: rationale and evidence from OECD countries¹

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Abstract

Economic activity tends to concentrate in space, generating very large spatial imbalances. As a result, there has been an on-going questioning on whether policies should address those spatial imbalances and if so which form should they take. In this context, the new economic geography literature has provided the foundations of modern location theory and has also motivated a debate about the rationale for spatially-targeted policies. In parallel of developments in the academic literature, the regional policy paradigm has also evolved. The paper describes the shift towards new types of place-based policies that has unfolded in OECD countries. These policies put much less emphasis on spatial imbalances and more on complementarities in policies designed to support growth, less on subsidies and more on investments, less on short-term solutions and more on long-term and sustainable ones. Our main conclusion, given that spatial dimensions are important for aggregate growth, the modern regional policy paradigm, if well designed, should be part of any growth-enhancing structural policy package.

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Keywords: regional policy, place-based policies, new economic geography

Resumo

A atividade económica mostra uma tendência a se concentrar espacialmente, o que pode gerar grandes desequilíbrios entre territórios. Por esta razão, existe um debate sobre se as políticas económicas devem corrigir estes desequilíbrios e de qual forma. Neste contexto, a literatura sobre a nova geografia económica forneceu as fundações da teoria da localização e uma racional para políticas territoriais. Em paralelo destes desenvolvimentos na literatura, o paradigma da política regional também evoluiu. Este artigo descreve a transformação do paradigma das políticas territoriais que se desenvolveu nos países da OCDE. Estas políticas põem menos ênfase sobre os desequilíbrios espaciais e mais sobre as complementaridades das políticas para apoiar o crescimento; menos em subsídios e mais nos investimentos; menos em soluções a curto-prazo e mais na visão a longo prazo da sustentabilidade. A nossa conclusão principal, dado que as dimensões espaciais são importantes para o crescimento agregado, é que o paradigma moderno da política regional, quando bem concebido, deveria de ser uma componente integrante de qualquer pacote de políticas estruturais.

Palavras-chave: políticas regionais, políticas territoriais, nova geografia económica

1. Introduction

Economic activity tends to concentrate in space. The debate over why this happens and whether policy-makers can or should do something about it has intensified over the past 20 years with the development of the New Economic Geography (hereafter NEG) literature. The latter provides a theoretical explanation as to how and why economic activity concentrates in certain locations, giving rise to core-periphery spatial patterns. The theory also shows that the benefits of agglomeration economies are sometimes offset by the costs arising from concentration. Depending on the parameters of the model, this typically generates multiple equilibria.

Contrary to the earlier neoclassical predictions of regional convergence over time, the New Economic Geography explains how the spatial imbalances and economic divergence can prevail and even increase in the medium and long run. This result has been reinforced by endogenous growth theory and institutional economics, which have recently been applied to explain differentiated spatial outcomes (Christ, 2009; and Acemoglu and Dell, 2010).

However, the NEG does not reach a clear-cut conclusion on the links between economic concentration and growth, or the limits on that relationship (see Annex 1). The NEG is in essence a trade-based model where space is equivalent to distance, no more and no less. Thus, it cannot provide a complete understanding of other factors enhancing or hindering the benefits of agglomeration, limiting the ability to think about how complex and constantly changing spatial patterns that affect overall productivity. Moreover, the NEG or endogenous growth models do not produce clear predictions as to whether convergence or divergence forces will dominate regional growth patterns.

In this context, the policy debate is still open as to whether or not policy-makers should promote agglomeration, be neutral to it or work to foster growth in other types of regions (for an overview of this debate see McCann and Rodriguez-Pose, 2012). Understanding and disentangling these two opposing forces seem critical to the design of policies capable of addressing the challenges generated by spatial imbalances while still delivering growth.

We argue here that place-based policies designed to promote the growth potential of all regions can enhance aggregate growth, through the mobilization of actors and resources and the alignment of sub-national with national objectives. Since, if well designed, place-based policies have the potential to improve aggregate performance, they should be part of the package of structural economic policies.

The paper begins by summarising key economic theories relevant to location decisions at the sub-national level and the policy recommendations emerging from them. Section three and four then describe the evolution of regional policies in OECD countries in recent decades, which have seen a shift from a reliance on compensatory transfers towards a more complex approach focusing on ways of enhancing growth potential (OECD, 2009). Section five presents a number of stylised facts describing growth trends among OECD regions emerging from our analysis during the pre-crisis period. The final section discusses the policy implications emerging from this analysis, in particular the growing importance of place-based policies in the context of well-being policies.

2. Models of convergence and divergence forces at the regional level

The traditional foundations for analysing convergence across regions goes back to early neoclassical models (*e.g.*, Ramsey, 1928; Solow, 1956; Swan, 1956; Meade, 1962; Cass, 1965; and Koopmans, 1965 or see Annex 1) based on production functions with diminishing returns to factor inputs and constant return to scale. Within this framework, initially capital-poor countries have higher marginal productivities of capital, leading them to grow faster than initially capital rich countries. The theory therefore predicts convergence in the medium-to-long run. This prediction arguably holds good, when taking a broader view of capital, to include human capital (Mankiw, Romer and Weil, 1992).

At the sub-national scale the theory is equally valid, since a production-function approach is also applicable at a lower geographical scale. This has given rise to a body of literature addressing convergence at sub-national level influenced by Barro and Sala-i-Martin (1995, 2003)². The decreasing returns to reproducible factors will contribute to the reduction, if not elimination, of regional disparities through equalisation of capital/labour ratios. Traditional views predict economic convergence among countries or regions provided that factor mobility and the diffusion of technology are not restricted. In other words technological improvements operate such that the presence of free trade and unrestrained market competition allows for convergence. Thus, integration would lead to greater economic development through a convergence process. If convergence is not observed, this approach suggests that some factors are immobile or that prices are artificially determined and the full gains of integration cannot be reached.

The neoclassical convergence framework assumes that decisions by people and firms to move to or from specific places in the real world are mainly driven by considerations of efficiency, which stem from perfectly competitive markets in which consumers have the widest access to the broadest array of desired goods and services using the least amount of resources. Thus, any breakdown in this state of affairs is caused by market failure, due to factor immobility, monopoly, barriers to entry, externalities or imperfect information. Only

² See, in particular, Barro and Sala-i-Martin (2003), who argue for the applicability of the model to convergence among regions

an identifiable market failure provides a rationale for a policy response tailored to the specific circumstances of a given place in economies where markets play a role in the allocation of resources. This response should attempt to deliver goods and services that the market is unable to provide in that place, and the response is deemed to be efficient if its benefits outweigh its costs (Kilkenny and Kraybill, 2003). Thus, in the neoclassical theory, only policy interventions that address market failure and enhance mobility in factors of production – labour and capital – are justified and desirable. A less restrictive interpretation of the theory can, however, justify policy actions and initiatives that enhance the factors supporting convergence (*i.e.*, *conditional* convergence).

In contrast, the main aim of the New Economic Geography is to explain why, and with what effects, consumers and firms tend to agglomerate together in geographic areas where other firms and consumers are already located. Earlier studies of this phenomenon include Perroux's notion of "growth poles" (1955), Myrdal's analysis of "circular and cumulative causation" (1957), and Hirschman's concept of "forward and backward linkages" (1958). The NEG formalises such cumulative causation mechanisms. Krugman (1991) provided the theoretical foundations by showing how relatively modest initial "triggers" can cause regions that are similar or even identical in underlying structure can differentiate over time into a richer core and a poorer periphery as a result of self-reinforcing mechanism of circular causation.

Generally speaking, such models share the following characteristics:

- An assumption of imperfect competition through increasing returns to scale in an economic sector – the monopolistic Dixit-Stiglitz (1977) model is the preferred choice.
- Space conceived as distance and modeled as trade or transportation costs.
- Forces enhancing (centripetal forces) or discouraging (centrifugal forces) agglomeration.

The first two items are embraced by all models, while the third item, the balance between centripetal and centrifugal forces, depends on the hypothesis. The three proposed centripetal forces include:

- Migration of labour (labour mobility between regions).

- Forward and backward linkages.
- Elasticity of labour supply (labour mobility between sectors).

All three forces positively enhance the formation of clusters. Workers tend to migrate towards the region with a higher initial industrial production, since more goods and services are produced there than in regions with lower industrial production. Their arrival increases local demand and local profits, which in turn attract even more firms offering more goods and services, and thus more workers. Through forward and backward linkages producers of final goods will find larger industrial concentration more attractive because a larger base of intermediate producers gives rise to forward (cost) linkages, while producers of intermediate goods will find it advantageous to produce near the large final good industry giving rise to backward (demand) linkages. The elasticity of labour supply operates very similarly to labour migration between regions. A high elasticity attracts non-industrial workers from the same region, increasing local demand and local profits, further attracting more firms. Centrifugal forces develop through lower competition in peripheral regions. Lower competition raises profits, thus attracting more firms.

Agglomeration economies occur when a firm enjoys increasing returns to scale (IRS) in a particular place. This could either be because of the presence of natural advantages (*i.e.* natural resources, location etc), monopolistic protection, political reasons (*e.g.* the decision to create a capital city) or any other reason. The presence of IRS induces other firms to locate there as well as people come in search of higher wages, job opportunities and cultural values.

There are main mechanisms at work to produce agglomeration economies (Duranton and Puga, 2004).

1. Mechanisms that deal with *sharing* of:

- Indivisible facilities such as local public goods or facilities that serve several individuals or firms. Some examples, other than public goods, are facilities such as laboratories, universities and other large goods that cannot belong to one particular agent but where some exclusion is implicit in the providing them.
- The gains from the wider variety of input suppliers that can be sustained by a larger final-goods industry. In other words, the presence of IRS, along with

forward and backward linkages, allows firms to purchase intermediate inputs at lower costs.

- The gains from the narrower specialisation that can be sustained with higher production levels. Several firms specialise in producing complementary products, reducing overall production costs.
- Managing risks. This refers to Marshall's idea that an industry gains from having a constant market for skills or in Paul Krugman's formulation, a pooled labour market. If there are market shocks, firms can adjust to changes in demand accordingly as they have access to a deep and broad labour market that allows them to expand or contract their demand for labour.

2. *Matching* mechanisms by which:

- Agglomeration improves the expected quality of matches between firms and workers, so both are better able to find a better match for their needs.
- An increase in the number of agents trying to match in the labour market also improves the probability of matching.
- Delays are alleviated. There is a possibility that contractual problems arising from renegotiation among buyers and suppliers result in one of the parties losing out by being held up by the other party in a renegotiation. This discourages investment. However, if the agglomeration is extensive enough, agents can change to an alternative partner.
- Learning mechanisms based on the generation, diffusion, and accumulation of knowledge. This refers not only to the learning of technologies, but also the acquisition of skills.

There are two main findings stemming from these studies (see Annex 1). First, *where transportation costs are too high, agglomeration does not occur*. Instead, production will be equally divided among regions; thus the model displays a unique stable equilibrium. When transport costs fall below a certain threshold, two stable equilibria may emerge. When labour mobility (between regions and sectors) is the *only* centripetal force, agglomeration will persist for all transportation costs below the threshold level. However, where

transportation costs are very low, and forward and backward linkages are present, agglomeration will not persist. In this case agglomeration will only occur at intermediate levels of transportation costs but will cease when they are further reduced, because wage differentials will induce firms to relocate to regions where wages are lower. Under this scenario, there are a number of possible equilibria, but the unstable equilibria flanking the point of equal division of production show particularly interesting results. According to these outcomes, some, but not total, concentration is possible. This is where most countries tend to find themselves.

In sum, NEG models explain why economic activity tends to concentrate in particular geographic spaces. They also reveal that the benefits of agglomeration economies are sometimes offset by the costs that arise with concentrations. It is no surprise, therefore, that the theory has not established a clear understanding of the links between economic concentration and growth. The first-generation NEG models just described have evolved into the current second-generation models (see Christ, 2009), which aim at better understanding the relationship between agglomeration, human capital and growth dynamics.

Predictions stemming from the NEG and endogenous growth models with increasing returns to scale stress that market-driven mechanisms cannot induce economic convergence but are instead bound to increase existing economic inequalities. Both theories argue that increasing returns to scale and externalities lead production factors to concentrate in the more developed areas, contrary to neoclassical theories that emphasise convergence forces. In other words, the nature of modern technologies is such that market forces lead to inequality and divergence in growth rates. As a result, economic integration increases economic divergence.

The policy implications of the early NEG models were unclear, as explicitly acknowledged by Fujita, Krugman and Venables (1999). Subsequent studies (e.g. Baldwin *et al.*, 1999), however, have been quite explicit with respect to the policy recommendations stemming from the NEG. In particular, the Sapir Report (Sapir *et al.*, 2004) and the World Development Report (2009) argue for unleashing forces of agglomeration and, by extension, tend to be critical of policies targeting places. These reports argue that policies targeting people

(space-blind) are less distortionary than policies targeting places, which tend to hinder agglomeration and by extension aggregate growth.

The above reports focus their analysis on, and provide policy recommendations stemming from, agglomeration economies, but they tend to disregard the growth potential of catching-up regions brought by forces of convergence. They also assume that the benefits of agglomeration will increase linearly in the medium and long run, ignoring congestion and other agglomeration-related diseconomies. They may therefore underestimate the growth potential outside major cities. Moreover, the place-based policies referred to by both reports basically involve exogenous compensatory interventions, often aimed at inducing firms to locate where they would not otherwise choose to be or to sustain household consumption and thereby discourage out-migration of labour. These are indeed not very effective tools for promoting growth and competitiveness in regions, since they tend to pay little or no attention to where the potential comparative advantages of a place may lie. We will explore the alternatives to such an approach below, drawing not only on OECD work but on the work of others who have drawn a rather different set of policy conclusions from the NEG.

To be sure, many structural policies should be uniform, *i.e.* not place-based. Many forms of regulation need to be economy-wide in order to avoid creating potentially large distortions; policy regimes in fields like pension provision should also be fairly uniform, to facilitate labour mobility. In fields like healthcare and education, there are strong arguments for basic frameworks that are uniform and spatially blind, even if some dimensions of implementation may involve differentiation across space. For example, urban centres with large populations of immigrant children may pose specific challenges that must be addressed if the broad spatially blind goal of providing adequate education to all is to be met.

This suggests that spatially blind policies may not be spatially neutral in impact. Moreover, it would be unwise ignoring the reality of sub-national institutions and elected officials or the extent to which “market-driven” agglomeration dynamics result from political choices made in such fields as infrastructure policy (Ades and Glaeser, 1995; Moomaw and Shatter, 1996; Henderson, 2002a-b). The debate, then, is not whether policies should be spatially-blind or place-based, rather how to ensure that policies implemented at different levels of government and do not work against each other, or even better, enhance each other and are well synchronised.

Many economy-wide policies can be fine-tuned and more efficiently delivered when differentiated across space, reflecting differences in, *e.g.*, local labour markets. In addition to education and training, this is largely true of active labour market policies, or the provision of public goods such as healthcare. The basis for place-based policies lies in the fact that assets, resources and labour markets tend to be differentiated across space, all having their own specificities. Mobilising context-specific assets efficiently requires on the one hand some degree strategic orientation and guidelines based on national priorities to ensure consistency. On the other, it requires the ability to identify local comparative advantages, which can only be only achieved through bottom-up initiative mobilising local actors.

3. The evolving debate about regional policies

Regional policy in the first decades of the post-war period relied mainly on the use of external financial support to correct imbalances in regional development. This period was characterised by relatively strong growth, fiscal expansion and low unemployment. The principal objectives of the measures introduced were greater equity and balanced growth in a period of rapid industrialisation. The main instruments used were wealth redistribution through financial transfers by the national government, along with large-scale public investments in physical infrastructure and inducements (via subsidies or tax breaks) to firms to locate some production in specific places. To a striking extent, such policies, though targeted at lagging places, were themselves spatially blind, in the sense that they paid little attention to the endogenous endowments and potential of such places. Indeed, the approaches taken in very different places were often quite similar. In this sense, they arguably resembled welfare-state policies targeting people based on some criteria of need (*e.g.*, unemployment) and treating them uniformly (*e.g.*, with transfers aimed at income maintenance) but with little attention to the underlying causes of that need (*e.g.*, lack of skills) or to ways of activating them (*e.g.*, ALMPs). During the 1970s and early 1980s, successive economic shocks and changes in the global economy led to the emergence of geographical concentrations of unemployment in many countries, and regional policy evolved rapidly to address this new challenge. The earlier focus on reducing disparities based mainly on income and infrastructure density was broadened to encompass

employment creation. The assumption was that public policy could alter supply conditions, by changing production costs through production subsidies and incentives, and that it could thereby influence industrial (re)location decisions for both existing firms and new investments.

In sum, regional policies in the earlier phases were essentially an instrument for compensating lagging places through subsidies to support infrastructure and public services in the poorest regions, as well as to induce firms to remain in or relocate to such areas. Such measures often distorted markets and harmed the development chances of the regions in the medium and long term; in many cases they generated more displacement of activity than growth. Attempts were also made to keep declining industrial sectors alive, so as to protect local jobs, when such sectors were being condemned in the long term. These government responses often failed in their objectives of reducing inequality over the medium and long term, by generating new jobs in lagging areas or triggering a culture of economic dynamism in targeted areas. Moreover, these actions had unintended consequences, in many cases creating a culture of dependency in recipient regions, many of which experienced development traps.

In response to these mixed results, the emphasis of regional policies in many countries evolved from a top-down compensatory policy towards lagging regions and aiming at reducing inter-regional inequality, towards a broader family of policies defining new objectives, new units of intervention, new strategies and new actors. The nature of this paradigm shift is summarised in Table 1.

	Traditional Regional Policies	New Paradigm
Objectives	Balancing economic performances by temporary compensating for disparities	Tapping under-utilised regional potential for competitiveness
Strategies	Sectoral approach	Integrated development projects
Tools	Subsidies and state aid	Soft and hard infrastructures
Actors	Central government	Different levels of government
Unit of analysis	Administrative regions	Functional regions
	Redistributing from leading to lagging regions	Building competitive regions to bring together actors and targeting key local assets

Table 1. Old and Modern paradigms of regional policy
 Source: OECD (2011).

Governments in OECD countries progressively embraced the new paradigm in principle (it was endorsed by the Ministerial Meeting of the OECD’s Territorial Development Policy Committee in 2009), but implementation has not always followed at the same pace. A good deal of “old-style” regional policy can still be observed in many countries. It is not always easy to tell the difference in practice, since concerns about, *e.g.*, equal access to essential services mean that some degree of fiscal equalisation and support for service provision in lagging regions is probably unavoidable on political grounds and quite defensible on grounds of equity.

Indeed, survey work carried out by the OECD Secretariat (cf. OECD, 2010), revealed that most OECD countries still recognise inter-regional disparities and decline of distressed areas as the main problem to be addressed by regional policies (Figure 1, panel A). Nonetheless, a majority of OECD governments also recognise that the main objective of regional policy should be regional economic competitiveness before the reduction of regional disparities (Figure 1, panel B).

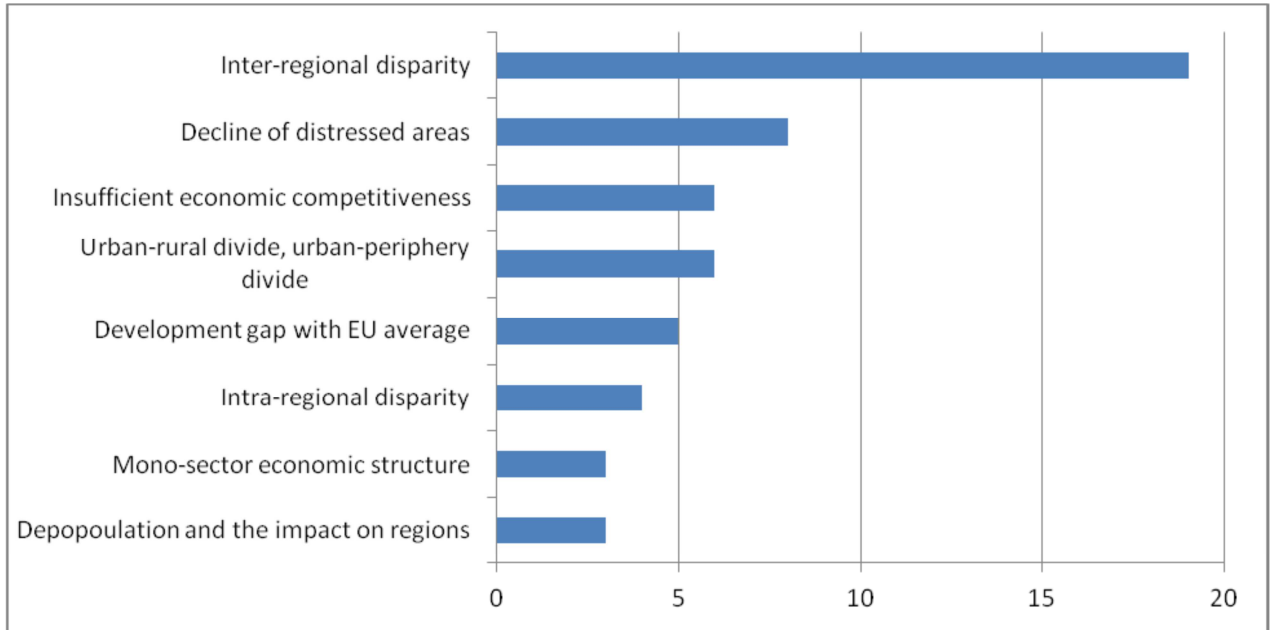
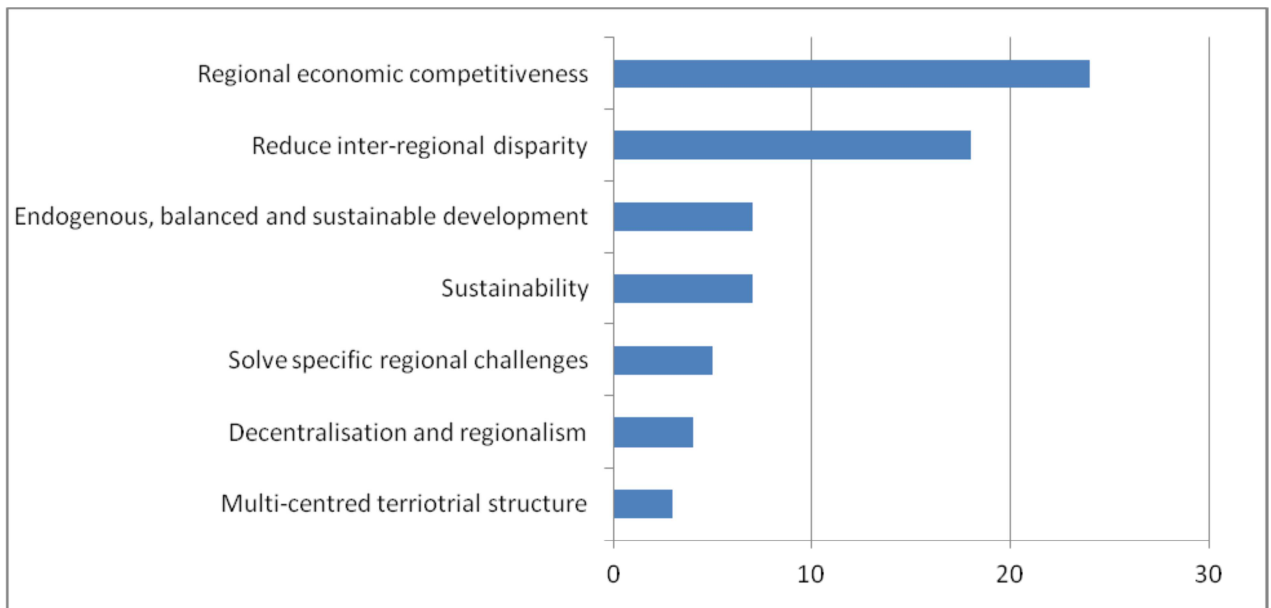


Figure 1. Main recognised regional problems and objectives of regional policy across OECD countries
 A. Main regional problems (nb. of country replies)



B. Main regional policy objectives (nb. of country replies)
 Source: OECD (2010)

It could be noted that, despite the focus on regional disparities, to the extent equalisation policies support services and interventions that enhance the economic potential and opportunities of people in lagging regions, they can be compatible with the new approach.

The modern paradigm seeks to shift the regional policy discourse from a zero-sum approach that tries to shift resources towards specific places towards a model that consists of

designing a portfolio of integrated and co-ordinated investments targeted toward the growth potential of regions. Crucially, this means that policy should in many cases facilitate structural change and reduce its costs rather than trying to forestall it. In the new approach, policies are differentiated according to regional contexts but at the same time they need to be co-ordinated across levels of government. The rationale for the new regional approach is based on the principle that opportunities for growth exist in the entire territory, across all types of regions, as will be documented in Section 5.

4. Main characteristics of place-based policies

In the literature the term “place-based policies” is often employed to designate policies that take into account the spatial dimension of economic activities. For example, developing labour markets or innovation in a city or in a rural area may not entail the same type of instruments and may require a differentiated approach. Policies that are “spatially blind” may miss this element of differentiation and thus are not the most effective way of promoting growth in all types of regions. However, because the term “place-based” is used to describe a wide range of policies, we need to clarify what we have in mind when using the term.

Away from the traditional compensatory approach, the modern regional policy paradigm encompasses the broader “family” of policies designed to improve the performance of regions, while enhancing aggregate performance as well. They focus on identifying and mobilising endogenous assets rather than exogenous investments and transfers; a development strategy covering a wide range of direct and indirect factors affecting the performance of local firms; an emphasis on opportunity rather than disadvantage; and a collective/negotiated approach to governance involving national, regional and local government along with other stakeholders, with the central government taking a less dominant role.

Examples here might include steps to strengthen and clarify the interactions between different components of a regional innovation system, local cluster policies or the adaptation of skills provision and active labour-market policies to reflect local needs. The

rationale for this approach is based on the principle that opportunities for growth may exist in the entire territory and across all types of regions. Therefore, place-based policies cover urban policies, rural policies and governance mechanisms across different levels of government.

In this context, modern regional development policies are based on three critical pillars:

1. A process involved the *identification of specific assets* (which may include a culture or community values) generating absolute advantages at the regional level or territorial capital (cf. Camagni, 2002)
2. Making use of the *complementarity of policies* in order to maximise their individual return on the local and regional economy
3. Use of *multi-level governance arrangements* to coordinate the objectives of different layers of government

The next natural question, which emerges in the modern regional policy paradigm, is given its emphasis on growth potential, should interventions be targeted only in few regions (*e.g.*, those representing the largest engines of national growth or those seen as the most problematic lagging regions) or in *all* regions? What empirical evidence can shed light into this question?

5. Stylised facts about regional growth across OECD countries

Our descriptive analysis covers the period 1995-2007, which represents approximately three business cycles before the global financial crisis. Our data are taken from the OECD regional database and our regional unit of analysis is based on two territorial levels. The higher level (Territorial Level 2 or TL2) consists of 335 large regions in the OECD. This type of region represents the first administrative tier of sub-national government. Examples include the Ontario region, or the Ile-de-France, containing Paris. The lower level (Territorial Level 3 or TL3) is composed of 1679 small regions. All the regions are contained within national borders and in most cases correspond to administrative regions. Each TL3 region is contained within a TL2 region. This classification – which, for European countries, is largely consistent with the Eurostat classification – helps us compare regions of about the same size. Indeed these two levels, which are officially established and relatively stable across the

OECD, are used as a framework for implementing regional policies in most countries. In our analysis we classify TL3 into three types of regions (predominantly urban, intermediate and predominantly rural) using the OECD regional classification (see Annex 2).

While predominantly urban generally exhibit higher levels of productivity and GDP *per capita*, they have not out-performed other regions in terms of growth performance. Predominantly rural regions appear disproportionately represented among the fastest-and slowest-growing regions. Overall, *per capita* growth has been stronger, on average, in both remote rural regions and in rural regions close to major cities than it has been in intermediate regions, which in turn have outperformed urban regions (Figure 2). This suggests that the recipe for high sustainable growth rates is not unique and that strong growth can indeed be achieved in many different types of regions. The greater heterogeneity in rural regions' performance might well point to a greater variation in the challenges facing such regions, but the data provide little support for the widely held belief that rural regions are necessarily in decline.

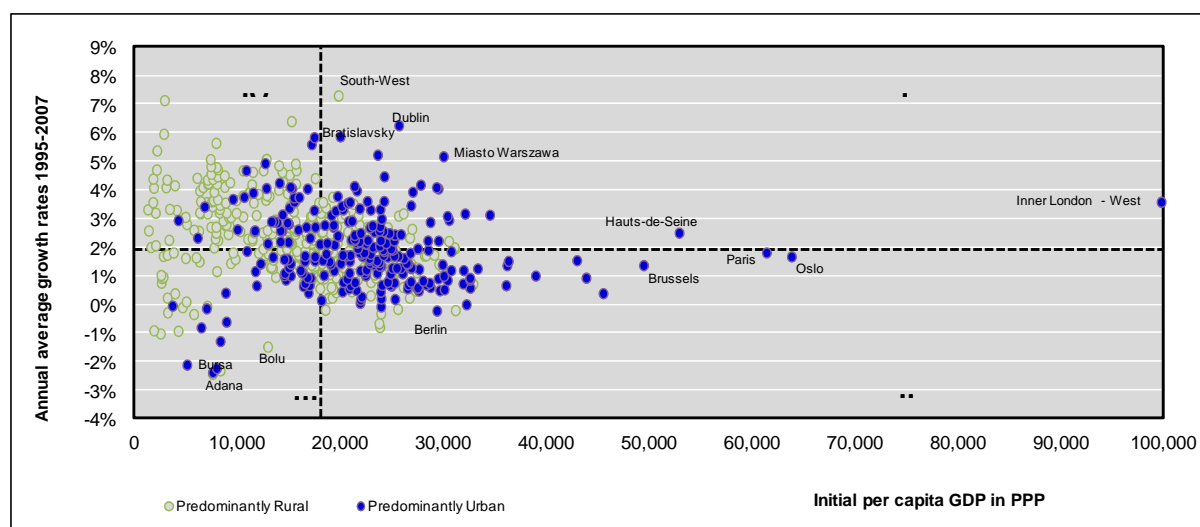


Figure 2 Initial GDP per capita and annual average growth rates in GDP per capita among predominantly urban and rural regions, 1995-2007

Note: The vertical and horizontal lines correspond, respectively, to the OECD urban and rural average growth rates and the average income level. Regions from the United States, Mexico, Switzerland, Canada, Australia, New Zealand and Iceland are missing due to lack of GDP data for TL3 regions.

Source: OECD (2009).

Four types of growth pattern can be identified in Figure 2: (I) rich regions (above average GDP *per capita*) growing at above-average rates; (II) rich regions growing at below-average rates; (III) less-developed regions growing above-average; and (IV) less-developed regions

with above-average growth. Had agglomeration forces been clearly predominant, the relationship between the level of GDP and subsequent growth rates would have been positive: quadrants (I) and (III) would have been the most populous. In a world dominated by forces of convergence, most regions would have fallen into quadrants (II) and (IV) and the relationship between initial GDP and subsequent growth would have been negative. The figure, however, does not yield any such regular pattern. The shape of the data cloud could therefore be interpreted as a reflection of the tension between convergence and agglomeration forces.

The analysis within different types of regions can help disentangling the two main forces driving regional growth. The corresponding picture for the TL3 intermediate regions (Figure 3) shows that convergence forces tend to dominate in that group, with a visible negative relationship between GDP *per capita* levels and growth rates. Figure 2 also shows greater dispersion of regional growth rates for lagging regions. This implies that some regions far away from the production frontier are catching-up quite rapidly, while other may be losing sizeable growth opportunities.

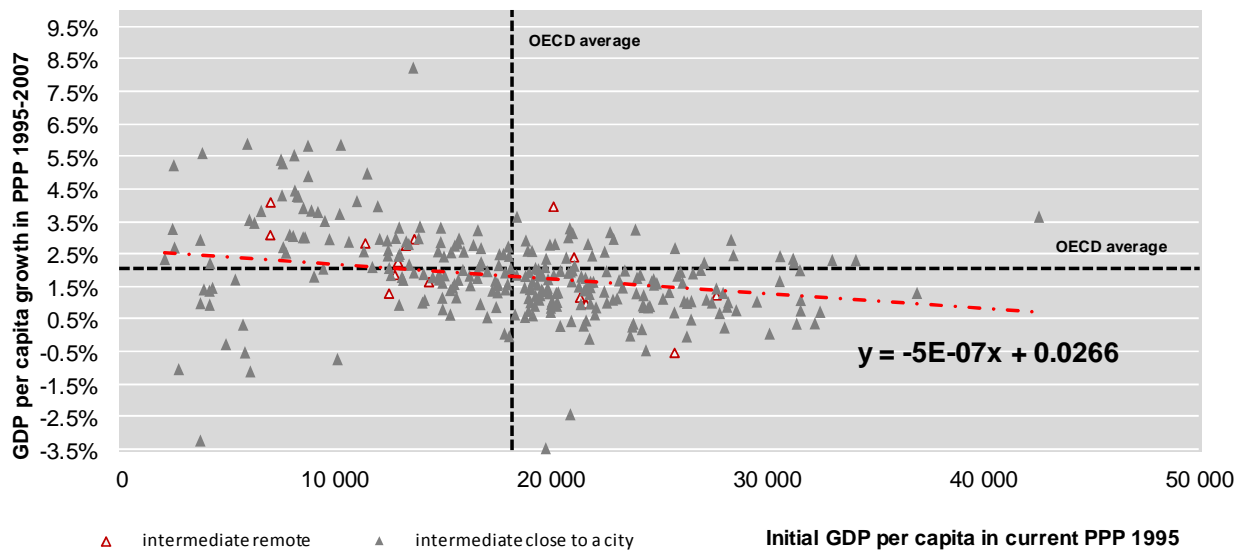


Figure 3. Growth trends in intermediate regions, 1995-2007

NB: The vertical and horizontal lines correspond, respectively, to the OECD TL3 average growth rates and the average income level. Regions from the United States, Mexico, Switzerland, Canada, Australia, New Zealand and Iceland are missing due to lack of GDP data at TL3 and regions from Japan, Korea and Slovenia are missing since the extended OECD taxonomy has still not been completed in these countries. United States, Mexico, Switzerland, Canada, Australia, New Zealand and Iceland are missing due to lack of GDP data at TL3.

Predominantly rural regions also appear to be experiencing a process of convergence (Figure 4), with faster growth being recorded in regions with lower levels of GDP *per capita*. The process of convergence appears to be even stronger than among intermediate regions. The highest growth rates (above 3.5%) of all regional types are chiefly to be found in regions with below average initial GDP *per capita*. Rural regions with above-average levels of GDP *per capita* appear to be growing more slowly.

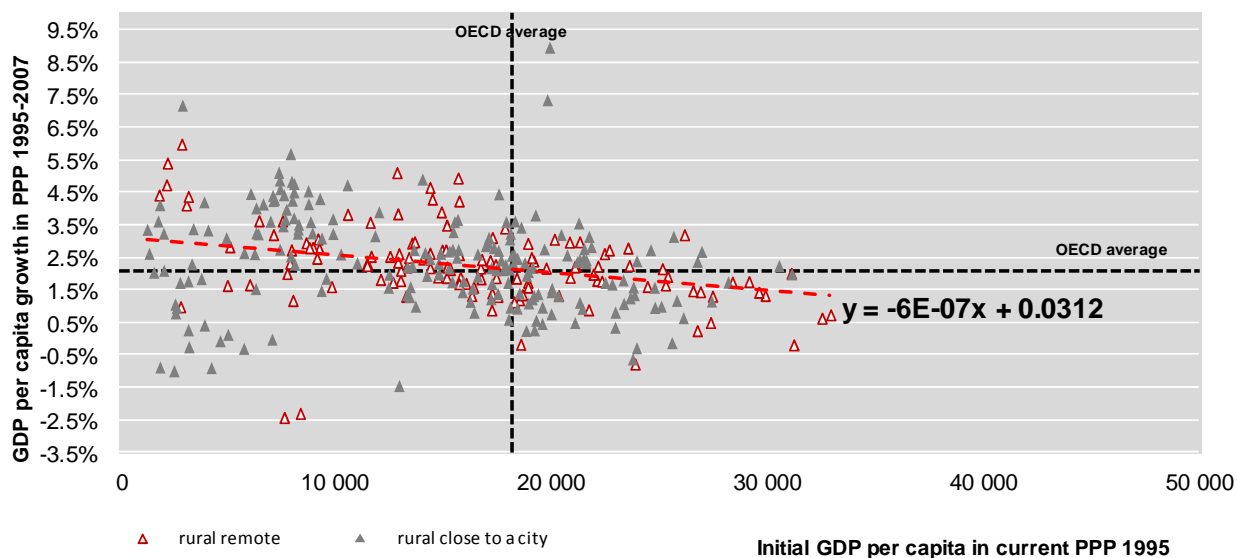


Figure 4. Growth trends in predominantly rural regions, 1995-2007

NB: The vertical and horizontal lines correspond, respectively, to the OECD TL3 average growth rates and the average income level. Regions from the United States, Mexico, Switzerland, Canada, Australia, New Zealand and Iceland are missing due to lack of GDP data at TL3 and regions from Japan, Korea and Slovenia are missing since the extended OECD taxonomy has still not been completed in these countries.

Source: Own calculations using OECD regional database

Figure 5 shows that among predominantly *urban* regions, both convergence and divergence forces are at work. While urban regions have higher levels of *per capita* GDP overall (78% display higher initial GDP *per capita* than the OECD average), the majority (56%) grew more slowly than the OECD average over the period in question, indicating convergence from the top of the distribution. In other words, urban regions beyond a certain level of GDP *per capita* tend to experience a deceleration of GDP per capita. Nonetheless, one may also observe the divergence among a group of urban regions recording fast growth with higher-than-average levels of GDP *per capita*.

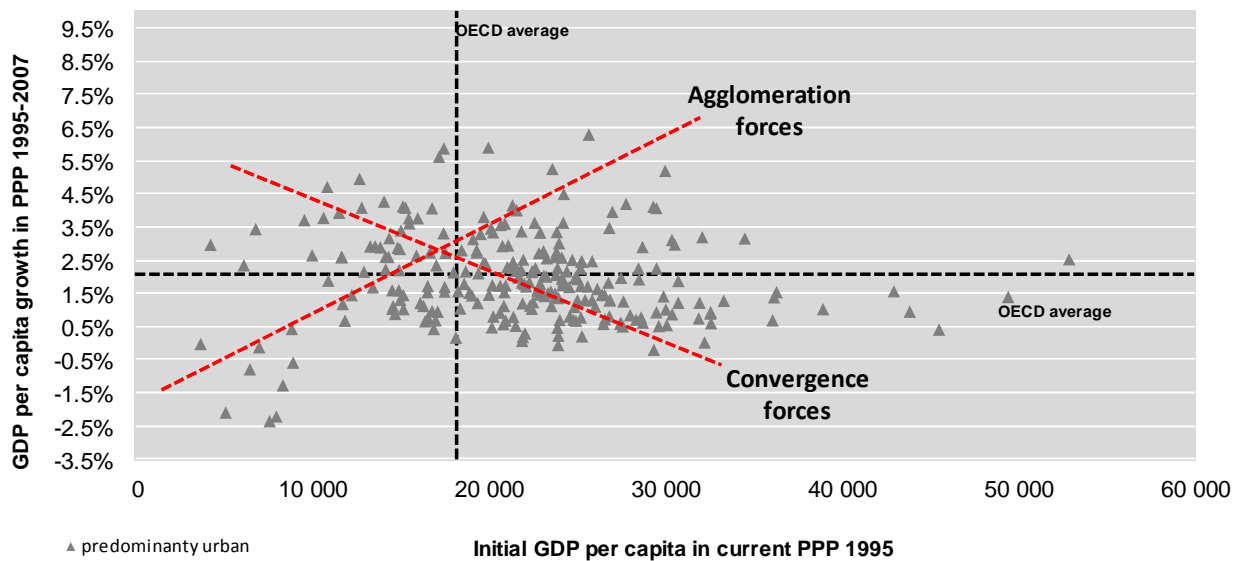


Figure 5. Growth trends in predominantly urban regions, 1995-2007

NB: The vertical and horizontal lines correspond, respectively, to the OECD TL3 average growth rates and the average income level. Regions from the United States, Mexico, Switzerland, Canada, Australia, New Zealand and Iceland are missing due to lack of GDP data at TL3.

Source: Own calculations using OECD regional database

More formally, we also measure the presence of convergence and divergence forces observed in Figures 2-5 through a beta-convergence analysis. This econometric cross-section analysis measures the relationship between the initial regional GDP per capita levels and their subsequent growth rates. A negative coefficient implies convergence, thus indicating that lower income regions on average grow faster and higher income regions on average grow more slowly. A positive coefficient implies divergence, indicating that richer regions grow even faster while poorer regions grow relatively more slowly. For reasons of consistency, we consider the same sample of regions as depicted in Figures 2-5, and we also consider the same time period covering the years 1995-2007. In essence we are measuring for absolute convergence in each of the three types of regions considered over the 12-year period. Our sample of regions total 233 urban regions, 295 intermediate regions and 322 rural regions. These regions are mainly European TL3 regions including Turkey, since our database lacks GDP TL3 data for the United States, Canada, Mexico and Australia. The results are presented below in the Table 2.

	model 1 urban regions	model 2 intermediate regions	model 3 rural regions
GDP per capita 1995	0.00000003	-0.00000046	-0.00000055
	0.78	-3.60	-5.24
F-value	0.08	12.98	27.47
R ²	0.0003	0.0424	0.0791
n	233	295	322

Table 2 Test of Beta-convergence in urban, intermediate and rural TL3 regions, 1995-2007
 Source: Calculations based on OECD Regional Database (2010)

For OECD urban regions, the sign of the estimated coefficient is positive indicating divergence, but it is not statistically insignificant, and the regression itself (F-value) is not significant. In contrast our estimated coefficient for intermediate regions is negative and statistically significant indicating a process of convergence over the period 1995-2007. Similar results are obtained for rural regions. Comparing the magnitude of the estimated coefficient, the convergence forces in rural regions appear stronger than among intermediate regions.

In sum, regional growth patterns suggest that:

- In many less developed OECD regions, the convergence forces push them to grow above urban regions, thus resisting the forces of agglomeration. Had this not been the case, we would be seeing initial GDP disparities increasing over time. The absence of convergence among urban regions, however, suggests that the benefits of agglomeration remain important in driving growth in urban areas.
- A minority of urban regions (and only they) demonstrate both high initial *per capita* GDP levels and higher growth rates. This suggests that agglomeration forces only operate in urban regions and are largely absent in intermediate and rural regions.
- There are opportunities for growth in all types of regions, regardless of whether they are urban, intermediate, or rural.
- The highest growth rates appear mainly in predominantly rural and intermediate regions, suggesting there is a strong catching-up potential in these type of regions.

Inter-regional labour mobility

A factor that may counteract the rationale for spatially-targeted policies is that labour could be quite mobile within countries and that mobility is relatively costless. This is a key

assumption of both neo-classical and endogenous growth theories. Yet, mobility costs can be substantial and encompass more than simply transportation and the transaction costs of changing residences; they also include the possible loss of family links, social networks and other forms of social capital, which may be particularly relevant for precisely those groups that might otherwise have the greatest incentives to move.

The degree of labour mobility within countries, according to our evidence, seems limited. Amongst a sample of 19 OECD countries considered over 1995–2009, the degree of average annual labour mobility is highest in Korea (Figure 6). The (unweighted) average value stands at around 4%, the level typical of in Norway, Germany, Italy, Sweden, Australia and Japan. Despite the fact that skilled labour tends to be more mobile, these figures essentially imply that that bulk of the workforce will stay in the region of origin over an extended period; most individuals have either been unable to seek productive employment away from home or disinclined to do so.

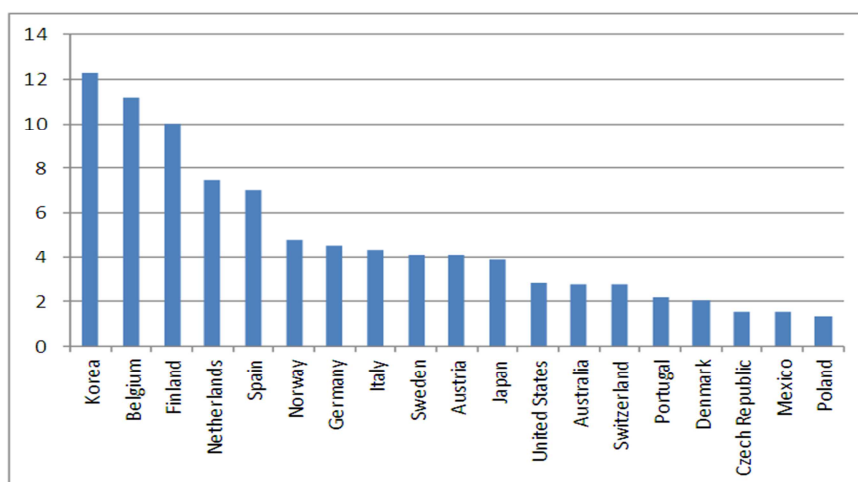


Figure 6. Average inter-regional mobility (in %), 1995-2009
Source: OECD Regional Database.

Moreover, labour mobility may have declined in recent years even in some countries, like the United States, traditionally characterised by high levels of mobility. These changes in mobility patterns may have been influenced by increasing home ownership and reinforced by the losses in the housing sector during the financial crisis that have tied many, particularly the least affluent, to their homes (OECD, 2011). If the bulk of the labour market is typically local and labour mobility is limited, it seems pertinent to analyse whether and in

what circumstances policies targeting specific places can mobilise these resources more efficiently.

Agglomeration, density and regional growth

The main argument against spatially-targeted policies is related to the existence of agglomeration economies. In some sense, the concentration of economic activities is an equilibrium outcome and any attempt to resist to these agglomeration forces would be basically inefficient. However, while large agglomerations have typically higher productivity levels, the relationship between economic or population density and growth is not straightforward. To investigate whether the fastest-growing regions are the ones becoming more populous or more densely populated, we examine over a twelve-year period the relationship among large TL2 regions across the OECD. We employ a technique proposed by Cuberes (2011), which follows a three step computational approach:

- We first rank regions by population size (and population density) from high to low. Rank 1 corresponds to the region with the largest population (population density) and rank n corresponds to the region with the smallest.
- Second, for each year over the period, we compute the 75th percentile of regions' growth rates (in GDP and GDP *per capita*) and consider regions whose growth rate is larger or equal to the this threshold. We thereby capture the fastest-growing quartile of regions.
- In the final step we compute the average rank of the fastest growing regions (from step 2) for each the twelve years.

Therefore, if the average rank value *decreases* over time, it would suggest that populous and densely populated regions were growing faster than the rest over time. If the average rank *increases*, it would suggest that faster growth is gradually occurring in less populated and dense regions. We find that over roughly three business cycles, there is a clear upward trend in the average rank of the fastest-growing quartile of regions among the three combinations we consider – GDP growth and population, GDP growth and population density, and GDP *per capita* growth and population (Figure 7). This indicates that the fastest growing regions are gradually *less* populated and *less* densely populated over time.

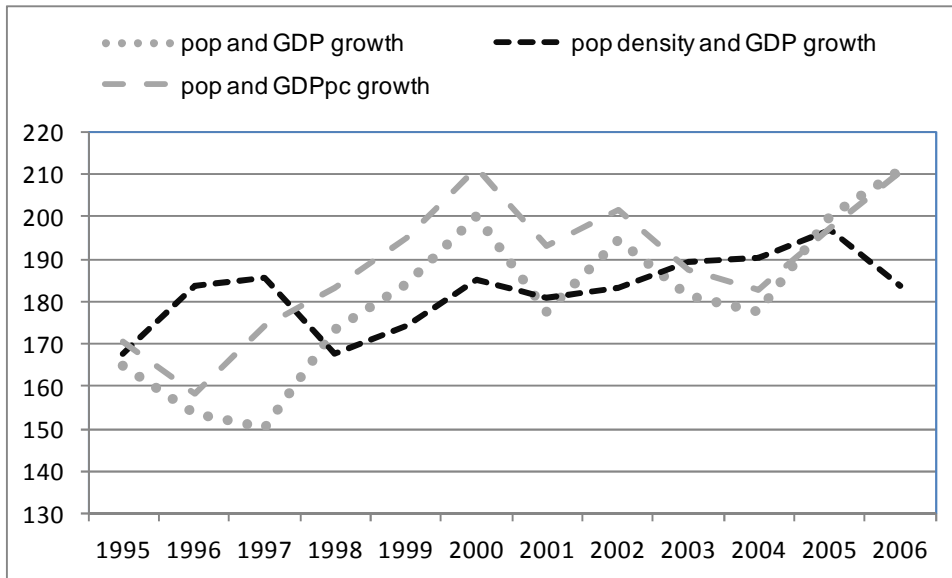


Figure 7. Population and population density in the 25% of fastest growing TL2 regions 1995-2007
Source: Authors' calculations based on OECD Regional Database.

These findings, point to the presence of growth potential in lagging regions through forces of convergence. The evidence presented on the limited mobility of labour within countries suggests a further reason for wishing to explore ways of mobilising the growth potential of lagging places, though care must be taken to avoid approaches likely to *deter* labour mobility. A critical policy question which follows is whether to focus on lagging regions, intermediate regions or all regions. For this task we need to map the regional with the aggregate dimension to gain an understanding of the aggregate effects of each of these scenarios.

It is important to observe that the relationship between agglomeration and growth may well vary on at least two related, albeit distinct, dimensions. The first is the level of development, and the second is the pace of urbanisation (as a dynamic process, rather than a steady state). The process of urbanisation is likely to be a more powerful growth driver as countries develop and urbanise: once cities reach a more or less stable size, agglomeration economies may remain important but they will not be increasing. This is but a hypothesis, but it does correspond very well to what World Bank (2009) shows in its estimates of production concentration in major economies over the last two centuries. The initially steep upward-sloping curves flatten out over time, in some cases even turning gently downwards, offering eloquent confirmation of the idea that the benefits of concentration are neither linear nor infinite. Kundu (2014, forthcoming) provides some empirical support for such a view, finding

that the relationship between urbanisation and *per capita* income varies considerably across four groups of countries, from the very poor to the most developed. Thus, developing economies may experience both very fast growth and rapidly increasing concentration of activity, but that does not imply that the path to faster growth is forever associated with ever higher levels of concentration, that low-density places are destined for relative decline or that the issues confronting the most advanced economies are the same as those facing the developing world.

Contribution of regions to the aggregate GDP growth rate

A region's contribution to aggregate GDP growth depends on both its size (*i.e.* its initial share in national GDP) and its growth rate. The impact of a large region displaying low growth rates could potentially be as large as the impact of a small region displaying very fast growth rates. It will depend on each of these two elements. In sum both a region's growth rate and its size are important elements for determining a region's contribution to aggregate output.

Accordingly, we compute the growth contributions by TL2 and TL3 regions to the OECD over the period 1995-2007 combining both elements and present their distributions in Figures 8 and 9 respectively. In both figures, the Y-axis display to total contribution of each region to OECD growth and the X-axis displays the regions ranked by their growth contribution. The growth contributions of OECD regions are highly skewed, and their distribution resembles a so-called "power law" distribution (see Garcilazo and Oliveira Martins, 2013). A few large regions (the big "hubs") account for a disproportionate share of aggregate growth, while the many smaller regions collectively account for the bulk of growth but do not contribute much individually.

A look at the growth contributions of 335 OECD Territorial Level 2 (TL2) regions over the period 1995-2007 suggests an approximate (1/3, 2/3) rule: a few big hubs (around 4% of the total) contribute close to one-third of aggregate growth, while two-thirds comes from the remaining regions. Amongst the 14 big regional hubs (Figure 8), more than half are in the United States and the remainder are, as one would expect, dynamic capital regions such as Tokyo (Kanto), London or Paris (Ile de France). Of course, the distribution of growth contributions at TL2 level reflects in part the great variation in the sizes of sub-national

jurisdictions in OECD countries – TL2 regions are typically defined by the top tier of sub-national government, so constitutional structure plays a role.

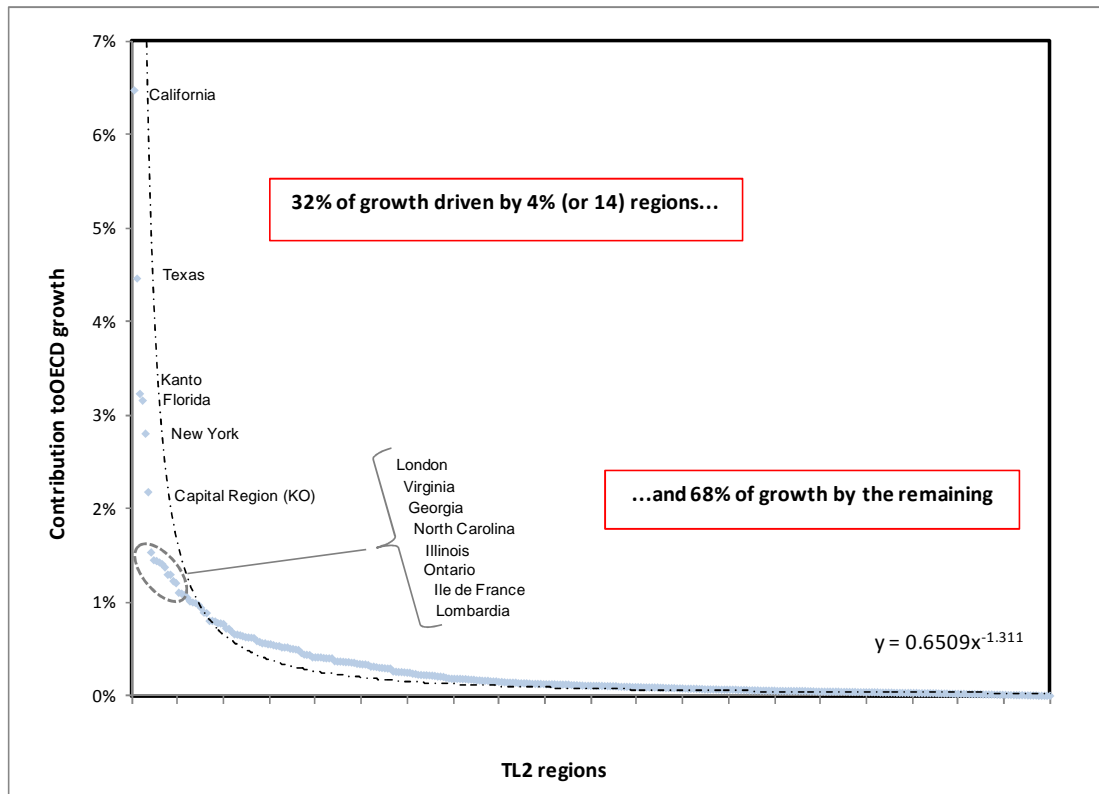


Figure 8. Contributions to aggregate OECD growth by TL2 regions, 1995-2007
 Source: Authors' calculations based on the OECD Regional Database.

The contributions to aggregate growth over the same period of those TL3 regions for which data are available³ also resemble a power law (Figure 9). Among TL3 regions for which data are available, Tokyo recorded the highest (4.1%) contribution to OECD GDP growth, followed by Gyeonggi-do (2.5%), Seoul and Madrid (1.9%). The top 20 TL3 contributors to aggregate growth represent only 2.4% of the regions and yet accounted for 27% of OECD GDP growth during 1995-2005. None of the remaining 97.6% of regions individually contributed more than 0.7% of GDP, but their combined contribution amounts to almost three-quarters of aggregate growth. Since TL3 regions vary in size less than countries or TL2 regions, this reinforces the impressions that the result is *not* chiefly a product of the variation in the size of the regions themselves⁴.

³ There are no TL3 GDP data for Australia, Canada, Mexico and the United States

⁴ The power law distribution also holds at *larger* scales: the contributions of OECD countries to aggregate growth in the OECD area form a similar distribution.

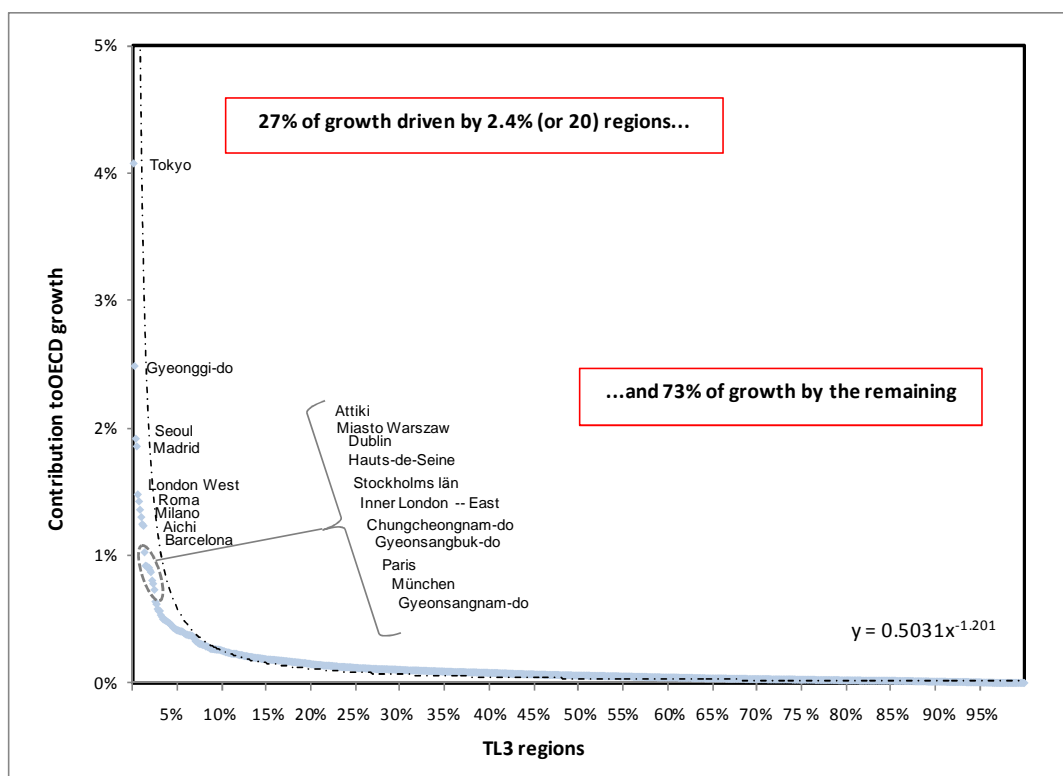


Figure 9. Contributions to aggregate OECD growth by TL3 regions, 1995-2007

Note: There are no GDP data for TL3 regions in Australia, Canada, Mexico, the United States and Switzerland.

Source: Authors' calculations based on the OECD Regional Database.

The fact that size and density are not enough is particularly evident if one observes that 15 of the 50 worst-performing regions in terms of growth are predominantly urban regions, with a combined population of over 16 million; a further 18, with a population of 10 million, are intermediate regions. This group of slow-growing regions includes such important urban areas as Grande Porto (Portugal), Hainaut (Belgium), Hyogo (Japan) and Berlin (Germany). For policy makers, the performance of these and similar regions must be seen as both a huge challenge and tremendous untapped opportunity: enhancing the dynamism of such urban centres could, on its own, have a palpable effect on the aggregate performance of the countries concerned and might also generate positive spillovers for neighbouring regions.

In terms of policy design the fact that the growth effect dominates in the group of regions contributing the bulk of aggregate growth reveals the importance of promoting growth in the maximum number of regions and, in particular, of focusing on two groups of regions with growth potential: catching-up group of regions and regions which have not exhausted the benefits of agglomeration effects. Given that the bulk of large urban metro-regions are

performing below national standards, this group is likely be smaller medium size city-regions reaping the benefits of agglomeration. This would particular the case if the benefits from agglomeration are not a linear function of size, starting slowly, accelerating, and then slowdown at a very large scale (this point will be the object of further research).

6. Conclusions and further research

The stylised facts presented in the previous sections suggest that forces of convergence as well as divergence are at work and that the result is a great deal of variation in regional growth patterns. Certainly, there is no evidence that some types of regions (such as remote rural places) are condemned to decline. They also point to the limits of growth models focused entirely on agglomeration and to the importance of regions outside the major cities as drivers of aggregate performance.

The global financial crisis has brought a new set of policy goals into the forefront of the debate, with a greater emphasis among OECD governments on the need to achieve a better balance between three policy goals: efficiency, environmental sustainability and equity. If previously, economic growth tended to be given priority, in the belief that the fruits of that growth could be used to address the other two, there is now a greater awareness of the need to pursue these three objectives in tandem, in a more balanced way and complementary way. Traditionally, policy debates have tended to focus on the trade-offs among these objectives, often overlooking potential synergies. These interrelations are schematically suggested in the policy matrix depicted in Figure 10. Usually policy evaluation concentrates in the diagonal of this matrix, but it obvious that synergies can be found in all cases. A policy system constructed in this way displays the property that the effect of every single policy is reinforced by the presence of the other policies.⁵

When it comes to addressing concerns of environmental sustainability and equity alongside growth objectives rather than as subsidiary or competing goals, a regionally differentiated approach may help policy-makers to understand better the trade-offs that are involved and

⁵ For a discussion about reform complementarities see Braga de Macedo and Oliveira Martins (2008).

to identify potential complementarities among the three objectives – in many cases, the interactions among sectoral policies are likely to be more apparent to actors operating where they occur, in specific places, than to national policy-makers designing “spatially blind”, sector-based policies.

Figure 10. New Development Paradigm: A Policy Complementarity Matrix

	E fficiency	E quity	E nvironmental Sustainability
Economic Policies	Sustained growth	Economic reforms may increase equity	Green growth may improve sustainability
Social policies	Social policies may increase efficiency (knowledge, trust)	Social cohesion	Environmentally sustainable social policies
Environmental policies	Green economy may boost innovation	Social policies can enhance inclusiveness; poor people are the most hurt by environmental degradation	Sustainable Environment

Source: OECD (2011)

To conclude, the analysis of the regional dimensions highlights both challenges and opportunities. On the one hand, there is a need for geographically differentiated policy responses to address phenomena like housing price collapses and some aspects of labour-market adjustment. At the same time, an approach more sensitive to specific regional contexts may also help strengthen the recovery and build it on new foundations. With governments are struggling to generate growth while pursuing fiscal consolidation, it is more important than ever to maximise the growth-enhancing potential of public expenditure – particularly public investment – by seeking to manage the trade-offs among structural policies as efficiently as possible and to maximise the potential synergies among them.

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Annex 1: an overview of the Main models of the New Economic Geography (NEG)

Krugman's 1991 model includes two *a priori* identical regions in endowment factors; two factors of production – agriculture with its constant-returns tied to the land, and manufacturers with increasing-returns (though a monopolistic Dixit-Stiglitz model) – that can be located in each region; and transportation costs for manufacturing goods. Workers are mobile across regions. The model finds that as transportation costs decrease and economies of large-scale production are present, a region with a relatively large non-rural population (or larger initial production) will be an attractive place to produce because of the large local market and because of the availability of goods and services produced there. This will attract more people increasing local demand and profits and attracting more firms. The forces of agglomeration depend on the level of trade cost and the proportion of mobile population in response to wage differentials. The external economies are pecuniary (not technological), arising from the desirability of selling to and buying from a region in which other producers are concentrated.

Krugman (1993) extends his 1991 model to examine equilibrium locations in continuous space. This model, built with the same assumptions as the 1991 model, is geared for explaining the formation of metropolitan centres. The analysis finds that agglomeration holds population concentration together and allows this concentration to occur in a variety of possible sites. Thus there are multiple equilibria for a metropolitan location.

Krugman and Venables (1995) drop the assumption of labour mobility. This model contains two economies (regions) identical in endowment preferences and technology, and two factors of production: agriculture and manufacturing. The manufacturing sector has monopolistic increasing returns to scale (Dixit-Stiglitz) and produces final goods as well as intermediate goods. The manufacturing sector has constant returns. The model assumes transportation costs. At high transportation costs all regions have the same manufacturing production. When transportation costs fall below a critical value the region with the larger (initial) manufacturing share will attract more firms due to forward and backward industrial linkages:

- Producers of final goods will find larger industrial concentration more attractive because there is a larger base of intermediate producers, giving rise to forward (cost) linkages.
- Producers of intermediate goods will find it advantageous to produce near the large final good industry, giving rise to backward (demand) linkages.

These forward and backward linkages will increase the real income of the core region relative to the periphery. If costs, however, continue to fall further, the wage differential will induce firms to relocate back to peripheral regions.

In **Venables (1996)** each economy has three sectors. The first sector (perfectly competitive) produces a tradeable good. The other two are monopolistically competitive and vertically linked, one providing an intermediate good to the other. Each industry contains firms in two locations and all firms supply to both locations. The production decision depends on the level of linkages and transportation costs. When transportation costs are high, firms locate close to consumers and thus produce in both locations. When transportation costs are low, firms also produce in both locations, bringing convergence since factor prices are low. For intermediate transportation costs clustering forces come to dominate giving rise to multiple equilibria. Some industries will agglomerate while others may spread out in response to factor price differences.

Krugman and Venables (1996) extend Venables (1996) for studying the process of European integration. This model includes two industries in two countries (regions). Both industries produce final and intermediate goods and use intermediate goods for production. Their technology of production is characterised by increasing the monopolistic returns to scale. There is no labour mobility and transportation costs are present. This simple model can be extended to study the dynamics of economic integration between several countries, each containing a variety of industries. The model starts with high transportation costs. Countries in this case will maintain the full range of industries since backward and forward linkages are not strong enough to lead to agglomeration. For very low transportation costs, the country with a strong initial position in some industry finds itself with an advantage that culminates over time due to forward and backward linkages. Each industry will completely concentrate in one country. For the intermediate value of transportation, agglomeration will take place only if industries are initially very unequally distributed.

Puga and Venables (1996) build a model for representing the process of industrialisation. In their model there are N identical countries producing manufacturing (with increasing returns) and agricultural goods (with constant returns). Trade/transportation costs are present while labour is immobile. The agglomeration forces are input-output linkages between firms in the industrial sector. If these forces are strong enough industry will concentrate in a single country. Wages in this country will be higher than elsewhere but the positive pecuniary externality will compensate for the higher wage costs until a critical mass is reached. At this point it becomes profitable for some industries to move out of this country into another country. More firms eventually move into this country to benefit from the backward and forward linkages, raising wages in this country until a critical mass is reached. The model predicts industrial spillover through a series of waves, from one country to another. Thus only a few countries are industrialised even if countries are identical to each other in their underlying structure.

In **Englemann and Waltz (1995)** there are two regions and four goods: a traditional good produced by skilled and unskilled labour, an industrial commodity, a sector producing non-tradable local goods and services, and a research and development sector. Mobile households supply skilled labour and immobile households supply unskilled labour. Both regions have identical monopolistic production functions. Growth is based on endogenous technological change in the non-traded sector. The model considers two extreme cases. The first assumes knowledge spillovers in research and development which only occur locally. In this case a core-periphery pattern always emerges where the region with a higher initial number of intermediates becomes the only industrial centre. The second extreme case assumes perfect interregional knowledge spillover effects, where knowledge is transported through the mobility of workers and the free tradeability of the industrial good containing the newly developed intermediate goods. This case allows for a variety of possible solutions (depending on the parameter values). These solutions comprise a stable steady state equilibrium with equal growth rates in both regions, even if one region is relatively specialised in the industrial good and the traditional sector is completely concentrated in the other region.

Martin and Ottaviano (2001) merge the new economic geography with endogenous growth models. Their model includes two regions, each region endowed with a fixed amount of

labour assumed to be immobile across regions. Transaction costs are present. A composite good is produced by a homogenous (constant returns) and a differentiated good (monopolistic production technology). The composite good can be used as intermediate input in the innovation sector to create new varieties of the composite good, thus innovation and production are jointly determined. The blueprint of the good is protected infinitely by a patent whose initial property belongs to the region where invention has taken place. The innovation sector is perfectly competitive. Patents can be sold and are initially equally distributed among regions. The equilibria in the model yield two solutions. If the economy starts in equilibrium there is no incentive to relocate production of the increasing returns sector because the demands for differentiated goods as well as their profits are the same in both regions. If one region gets more firms producing differentiated goods, then the cost of inputs for innovation in that region will be lower due to the presence of transaction cost between the regions. Agglomeration will occur in the region where all the innovation activity has developed. The other region will cease any innovation activity.

Puga (1998a) develops a model similar to Krugman (1991) for exploring why urbanisation patterns in Europe are different than in the less developed countries. The model includes two regions, each allowing for a possible city and agricultural hinterland location. There are transportation costs, labour migration, and two sectors; manufacturing with increasing returns, and agriculture with constant returns. The novelty relative to Krugman (1991) is in allowing for labour mobility between both sectors. With this modification, the elasticity of labour supply is also a pecuniary externality in addition to internal economies of scales in manufacturing and the cost of spatial interactions which encourages firms and workers to choose locations with good market access (which in turn are locations with many firms and workers). Agglomeration is enhanced in the emerging city when labour supply is sufficiently elastic, since labour can be drawn from other cities and from the pool of agricultural workers. Under high transportation costs, the model predicts the emergence of a balanced system of cities. When transportation costs are low, agglomeration forces lead to urban primacy. A high elasticity of labour supply enhances the development of a primate urban pattern. Puga concludes that the larger metropolises present in the less developed countries are due to lower costs of spatial interaction, stronger economies of scale, and more elasticity in supply of labour to the urban centre.

Puga (1999) notes salient differences in patterns of economic geography between Europe and the US. In the latter there are narrower income differentials and a higher concentration of industry. The model in this paper addresses whether integration in Europe will narrow the differences relative to the US, or augment them. The model includes two regions, each with increasing returns in the manufacturing sector and constant returns in the agricultural sector. There are transportation costs, mobility between sectors, and backward and forward firm linkages. The model is divided into two specifications. In the first, labour is also mobile between regions, and in the second it is fixed (but mobile between sectors). The first specification adds forward and backward linkages and intersectoral migration to Krugman's (1991) model. The results obtained in Krugman's model also hold with these additions: high trade costs yield convergence (no agglomeration), and reductions in trade costs beyond a threshold level yield agglomeration. In the second specification (no interregional migration) firms split between the regions at high trade costs. At intermediate levels of trade they agglomerate due to cost and demand linkages creating wage differentials. At low levels of trade cost firms spread out across regions again since they want to be where immobile factors are cheaper. Thus for the case of European integration (a reduction in trade costs) agglomeration depends on the mobility of labour. If labour is mobile, agglomeration will be intensified. If on the other hand it is not mobile, agglomeration will occur, but eventually firms will spread out across regions in response to the wage differentials.

Annex 2 – OECD regional typology

The OECD typology classifies TL3 regions as predominantly urban, predominantly rural and intermediate. This typology, based on the percentage of regional population living in rural or urban communities, allows for meaningful comparisons among regions of the same type and level. The OECD regional typology is based on three criteria. The first identifies rural communities according to population density. A community is defined as rural if its population density is below 150 inhabitants per square kilometre (500 inhabitants for Japan, to account for the fact that its national population exceeds 300 inhabitants per square kilometre). The second criterion classifies regions according to the percentage of the population living in rural communities. Thus, a TL3 region is classified as:

- predominantly rural (rural), if more than 50% of its population lives in rural communities;
- predominantly urban (urban), if less than 15% of the population lives in rural communities;
- intermediate, if the share of population living in rural communities is between 15% and 50%.

The third criterion is based on the size of the urban centres. Accordingly:

- A region that would be classified as rural on the basis of the general rule is classified as intermediate if it has an urban centre of more than 200 000 inhabitants (500 000 for Japan) representing no less than 25% of the regional population.
- A region that would be classified as intermediate on the basis of the general rule is classified as predominantly urban if it has a urban centre of more than 500 000 inhabitants (1 million for Japan), representing no less than 25% of the regional population.