

## REGIONAL DEVELOPMENT THEORY

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### Summary

This paper offers a concise and selective overview of regional development theories. Starting from traditional regional growth theory, it introduces next findings from location and agglomeration theory, including infrastructure and network modeling. Next, innovation, entrepreneurship and knowledge are addressed, and interpreted as critical success conditions for modern regional development. Elements from endogenous growth theory and the new economic geography are introduced as well. Finally, attention is paid to the regional convergence debate, while the paper concludes with some prospective views.

### 1. Regional Development: What and Why?

Regional development is about the geography of welfare and its evolution. It has played a central role in such disciplines as economic geography, regional economics, regional science and economic growth theory. The concept is not static in nature, but refers to complex space-time dynamics of regions (or an interdependent set of regions). Changing regional welfare positions are often hard to measure, and in practice we often

use Gross Domestic Product (GDP) per capita (or growth therein) as a statistical approximation. Sometimes alternative or complementary measures are also used, such as per-capita consumption, poverty rates, unemployment rates, labor force participation rates or access to public services. These indicators are more social in nature and are often used in United Nations welfare comparisons. An example of a rather popular index in this framework is the Human Development Index which represents the welfare position of regions or nations on a 0-1 scale using quantifiable standardized social data (such as employment, life expectancy or adult literacy).

The motives to measure regional development are manifold. But a prominent argument all over the years is that welfare positions of regions or nations may exhibit great disparities which are often rather persistent in nature. These in turn translate into large disparities in living standards. For example, in 1960, the world's richest country had a per capita income that was 39 times greater than that of the world's poorest country (after correcting for purchasing power), while by the year 2000, this gap had increased to 91. Areas in our world do not only have significant differences in welfare positions, but it takes also sometimes decades or more to eliminate them. As an illustration we take here Tanzania (the world's poorest country in 2000), which experienced on average a modest growth rate of 0.6 percent per annum over the period 1960-2000. In order to reach the world's average per capita income of 8,820 US dollars per annum at its current rate of growth, it would need another 485 years. Even if the annual growth rate were to increase to 1.8 percent (i.e., the world's current average), it would need 161 years to close the gap. And if it were to grow at the rate of South Korea (the fastest grower over the period concerned), it could close the gap in just 49 years. Persistent spatial welfare disparities are a source of frustration for both economists and policy-makers.

The present article is about regional economic development, in contrast to national economic development. The difference between regions and countries is not always very clear (for instance, several US states are larger than many countries in Europe), but the major distinction in most cases is the fact that regions are open spatial entities (in contrast to countries), while the competence of a region may normally be superseded by the nation. Regions display a spatial subdivision of a country and are characterized by a distinct degree of spatial diversity.

Regional development is clearly a multidimensional concept with a great socioeconomic variety that is determined by a multiplicity of factors such as natural resource endowments, quality and quantity of labor, capital availability and access, productive and overhead investments, entrepreneurial culture and attitude, physical infrastructures, sectoral structure, technological infrastructure and progress, open mind, public support systems, and so forth.

The literature on regional development has usually centered around two dominant issues: how is regional welfare created and how can we cope with undesirable interregional welfare discrepancies? The first question is normally referred to as

‘allocative efficiency’ and addresses the economic issue of an optimal spatial-economic use of scarce resources (i.e., inputs such as capital, labor, physical resources, knowledge etc.) so as to generate a maximum value of output. The second question is more of a socio-political equity nature and addresses the mechanisms and conditions (economic, policy interventions) that may help to alleviate undesirable development disparities in the space-economy. Normally, efficiently operating regions tend to grow faster than regions with less favorable development conditions, so that there is an in-built tension between efficiency and equity among a system of regions, at least in the short run. It goes without saying that the efficiency-equity dilemma is one of the most intriguing issues in regional development policy which has extensively been discussed in the literature.

The present contribution aims to shed light on the complexity of regional development. It will start off from the heart of regional economics, viz. location and allocation theory, and will include an exposition on neo-classical factor endowment and infrastructure theory (Section 2). Next, a more contemporaneous contribution will be offered on the modern drivers of regional development, viz. knowledge and entrepreneurship, while also paying attention to recent advances in endogenous growth and the new economic geography (Section 3). In a subsequent section (Section 4) we will address more explicitly the so-called convergence debate and the role of governments in regional development policy. We will conclude with some retrospective and prospective remarks.

## **2. Location of Human Activity and Regional Development**

The history of mankind has exhibited an interesting geographic pattern, where accessibility (e.g., river banks, coastal areas) and favorable physical-geographical conditions (e.g., climate) were decisive factors for settlement. These areas created the foundations for large agglomerations (such as New York, London, Tokyo or Venice). Regional development appeared to be contingent upon the existence of large economic attraction poles. Thus, location of economic activity created the foundations for regional welfare. Even nowadays, persistent discrepancies in regional welfare have historical roots in locational conditions of these high-potential areas. The present figures of our world are still striking: approx. 1 billion people live on less than a dollar per day, while more than 2 billion people have no access to adequate sanitation. And the gap between poor and rich is formidable and even increasing. For example, the top 20% of the world’s population consumes about 85% of the world’s income, while the bottom 20% lives on approx. 1.5% of the world’s income. And things get worse: a generation ago, people in the top 20% were 30 times as rich as those in the bottom 20%; nowadays, they are more than 70 times as rich!

The location patterns of people and economic activity in our world show apparently a great variation. And hence, location theory has played a central role in explaining not

only the dispersion of economic activity, but also the dispersion of welfare among regions. Consequently, regional development theory is deeply rooted in location theory.

Location theory has already a long history in regional economics and economic geography. Starting off from path-breaking ideas set forth by Von Thünen, Christaller, Lösch, Isard, Hoover and many others, modern location theory has moved into a strong analytical framework for regional economics and economic geography. Cost minimization and profit maximization principles are integrated in a solid economic setting, in which both partial and general spatial equilibrium studies on the space-economy can be found that highlight the geographical patterns of industrial and residential behavior. Furthermore, the theory is also able to encapsulate the impact of public actors (e.g., regional development policy).

Thus, the fundamentals of classical location theory are made up of a blend of physical geography (determining the accessibility of a location and the availability of resources) and smart economic behavior (through a clever combination of production factors and market potentials in space).

However, location patterns are never static, but have an endogenous impact on newcomers. Thus, incumbent firms may attract others through scale, localization and urbanization advantages (e.g., in the form of spatial-economic externalities in a Marshallian district). Consequently, agglomerations tend to become self-reinforcing spatial magnets impacting on the entire space-economy. Such concentrations of economic activity create welfare spin-offs for a broader regional system and thus determine the geographic patterns of welfare and regional development. In this context, we may also observe a blend between location theory and urban economics or urban geography.

In recent years, we have witnessed the emergence of the digital economy through which actors could be networked world-wide. As a consequence, the interaction between industrial networks and location as well as the access to telecommunication networks has gained much interest. Locations that offer the best available network services are the proper candidates for many firms in the ICT, high-tech and high-services sectors and are able to generate a high value added to regional development.

The availability of and access to infrastructure is another critical success factor for regional development. In addition to the presence of labor as capital on traditional factor inputs, we observe an increasing interest in measuring the impact of infrastructure on regional development. Especially in a world with shrinking distances, space-time accessibility of regions becomes a critical determinant of relative regional-economic positions. Transport economics and transport geography have offered an abundance of theoretical and empirical evidence on the importance of physical infrastructure for regional growth. The uneven provision of infrastructure have also been identified as a key determinant of regional income disparities in less developed countries, as is witnessed in various World Bank studies.

### **3. Entrepreneurship, Innovation and the Knowledge Economy**

Since Marshall, Schumpeter and Kirzner we know that innovation and entrepreneurship are the driving factors behind economic growth. There is an avalanche of literature on the importance of entrepreneurship for enhancing the innovative capacity and growth potential of regions.

Entrepreneurship is a complex and multi-faceted phenomenon that finds its roots in risk-taking behavior of profit-seeking individuals in a competitive economy. But its determinants have also clear correlations with gender, age, education, financial support systems, administrative regulations, risk tolerance and market structures. Entrepreneurship lies at the heart of innovation as the art of doing creative things for the sake of competitive advantage. The debate on entrepreneurship and innovation has – from a geographical perspective – prompted the emergence of new concepts such as innovative regions, innovative milieus learning regions, or knowledge-based regions. Innovation has become the critical survival factor in a competitive space-economy and determines the direction and pace of regional development. A key aspect of innovation in a modern space-economy is the use of and access to the information and communication technology (ICT) sector. Consequently, ICT infrastructure is increasingly seen as a necessary resource endowment for regional development.

It goes almost without saying that ICT is a necessary ingredient of a modern knowledge-based economy. And that also holds for regions. Clearly, knowledge is a composite good with many facets, but from an economic perspective knowledge serves to enhance productivity and to induce innovations. There is indeed an ongoing debate on the unidirectional or circular relationship between knowledge and development, and this forms one of the central issues in endogenous growth theory (see Section 4).

Endogenous growth theory has played a central role in the growth debate since the 1990's. The main idea of these new contributions is that technological progress is not exogenously given, but an endogenous response of economic actors in a competitive business environment. Consequently, in contrast to earlier macro-economic explanatory frameworks, the emphasis is much more on individual economic behavior of firms. In this way, it can be demonstrated that regional growth is not the result of exogenous productivity-enhancing factors, but rather the outcome of deliberate choices of individual actors (firms and policy-makers).

The importance of knowledge for innovation and entrepreneurship is thus increasingly recognized. The spatial distribution of knowledge and its spill-overs are considered as an important success factor for regional development in an open competitive economic system. Thus, the geographical patterns of knowledge diffusion as well as the barriers to access to knowledge are decisive for regional development in a modern global and

open space-economy. Consequently, knowledge policy – often instigated by ICT advances – is a critical success factor for regional welfare creation.

Regional development policy appears to move increasingly towards knowledge and innovation policy. In recent years, it is also convincingly demonstrated that leadership and institutional qualities have a great impact on regional welfare, in particular, when the role of leadership is linked with innovation and knowledge-creation. To the same extent that innovative entrepreneurship is critical for long-term regional welfare growth, governance and leadership are essential for a balanced regional development. Leadership presupposes proactive behavior, visions for future development, awareness of institutional and behavioral processes, responses and bottlenecks, as well as acceptance by the population. The awareness of the importance of leadership and entrepreneurship lies in with the recognition of creative actions and learning actors. Studies on regional leadership are rare, but this is certainly a promising and important new field of research.

In recent years, we have also witnessed the emergence of a new strand of literature, coined the ‘new economic geography’, in the vein of endogenous growth theory. Although the term ‘new economic geography’ is arguably not appropriate (most concepts can already be found in the regional economics and regional science literature since the 1950s), this seemingly new approach has attracted quite some attention within the neoclassical economics literature. It marries the increasing-returns monopolistic competition model with the micro-foundations of spatial-economic behavior, including interregional trade. This recent approach emphasizes the importance of agglomeration externalities (caused by increasing returns to scale) for regional welfare creation, in the context of global competitive forces where trade (between regions or countries) plays a critical role. This, regions are then part of a global competitive network system. Recent contributions within this literature have found that agglomeration can be a welfare-improving outcome for workers in both core and periphery regions, for instance, if agglomeration raises the innovation rate. This result provides theoretical support for regional development policies destined to support and enhance existing clusters of specialization.

#### **4. The Convergence Debate**

Regions and nations in our world show complex development patterns. Textbook economics would teach us that under conditions of free competition, homogeneity of preference and technology parameters, and mobility of production factors all regions in the space-economy would tend to converge to the same per-capita income growth rate. In neoclassical economic growth models, convergence between regions takes place through capital accumulation. Regions that are further away from their state states grow faster in the short run, but in the long run diminishing returns to capital set in and the growth rate drops to the exogenous growth rate of technological progress. This tends towards a situation where the growth rate of GDP per capita falls and becomes

constant (i.e., it becomes equal to the exogenously-determined technological growth rate). The neo-classical growth models therefore predict that in the long run countries and regions will converge in terms of per-capita income levels, if one controls for the effects of differences in initial conditions.

A basic problem in the above neo-classical explanation of the world is that technological progress is not exogenous ‘manna from heaven’. It is part of the complex architecture of a regional economy and is determined by both internal and external R&D investments, on-the-job training, learning by doing and spillovers from university research. Spillovers resulting from R&D expenditures and other activities generate increasing returns to scale for reproducible production factors, the existence of which implies the possibility of long-run divergence in per-capita income levels.

The conflicting predictions of the neoclassical and endogenous growth models have generated intense scrutiny and a plethora of empirical studies, known collectively as the ‘convergence debate’. The literature has generally found that while per-capita income levels between the poorest countries (of Sub-Saharan Africa) and the richest countries (Europe and the United States) have diverged over the past few decades, there is convergence among countries that are similar in terms of initial conditions and policies, for instance, among the countries of the European Union or the fast-growing East Asian economies (a phenomenon known as ‘conditional convergence’). The evidence also suggests that per-capita income levels among regions within countries have diverged markedly in recent years, particularly in large, diverse countries such as India and China. An increase in regional disparities in fast growing regions such as India and China is not necessarily bad news, however. Improvements in living standards in vast countries such as these implies that global inequality as a whole may be decreasing (in tandem with improvement in living standards in these countries), and economic theory suggests that an increase in agglomeration may lead to further improvements in the long run, as knowledge spills-over into other regions and sectors of the economy. The findings of the convergence literature therefore highlight the key role of regional development policies in promoting economic growth and human development.

## **5. Regional Development Policy in Perspective**

The policy response to regional inequality or spatial disparity is characterized by a great variety all over the years. Several strands of literature can be distinguished, in particular:

- supply-side policy of a Keynesian nature with a pronounced interest in public spending in less privileged regions;
- growth pole strategies, with a clear emphasis on a concentrated growth impulse in a few designated place or areas;

- infrastructure policy with the aim to create the necessary physical conditions (e.g., improvement of accessibility) in order to enhance the competitive capabilities of regions;
- self-organizing policy where regions are encouraged to get their acts together on the basis of indigenous strength with a limited role of governments;
- suprastructure policy in which regions are provided with favorable R&D conditions, educational facilities, knowledge centers and the like in order to create the conditions for a self-sustained development.

Regional policy has played an important role in shaping the European Union, as the vast differences in regional development among European regions would weaken social cohesion in Europe. The Structural Funds administered by the European Union, and in particular, the Regional Development Fund, have been strategic vehicles to cope with spatial disparities in Europe. It is noteworthy that the various above mentioned explanatory frameworks for regional development differences have often been incorporated in the policy responses on spatial disparities in Europe, including the current interest in entrepreneurship and technological innovation.

An important contributor to regional development is technological progress, an extensively studied topic in the recent economic growth literature. From a geographic (regional, urban, or local) perspective, much attention has been paid to the spatial conditions that induce technological progress (e.g., entrepreneurial climate, availability of venture capital, incubator facilities etc.). Furthermore, also the spatial diffusion of technology has obtained much attention, in particular in the geography literature. A particular case of knowledge and technology diffusion can be found in foreign direct investment (FDI). Several studies have demonstrated that FDI offers access to foreign production processes, so interregional or multinational technology spillovers may occur. These studies demonstrate clearly that the region is a dynamic player in an intricate web of spatial-economic interactions. Regional development is not a static phenomenon, but exhibits a dynamic pattern based on the interplay of various stakeholders (the business sector, households/workers and governmental bodies), who have to face the challenge put forward by an open space-economy.

## Glossary

<b>Endogenous growth:</b>	Growth of output in the economy that is driven by long-run improvement of productivity of the production factors, with this improvement being sensitive to various aspects of the economy.
<b>New economic geography:</b>	Axiomatic approach to formal mathematical modeling of economic behavior of households and firms across



space, allowing for imperfect competition and resources required for spatial interaction.

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Peter Nijkamp is Professor of Regional Economics, Faculty of Economics and Business Administration, VU University Amsterdam, since 1973. He has been Visiting Professor in several universities in Europe, North-America and Asia. He is a fellow of the Royal Netherlands Academy of Arts and Sciences (KNAW) and of the Belgian Academy of Sciences. At present, he is President of the Governing Board of the Netherlands Organization for Scientific Research (NWO).

Peter Nijkamp's main research interests cover plan evaluation, multicriteria analysis, regional and urban planning, transport systems analysis, mathematical modeling, technological innovation, and resource management. In the past years he has focused his research in particular on quantitative methods for policy analysis, as well as on behavioral analysis of economic agents. He has a broad expertise in the area of public policy, services planning infrastructure management and environmental protection. In all these fields he has published many book and numerous articles.

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Maria Abreu is Research Associate at the Centre for Business Research (CBR) of the University of Cambridge, and Research Fellow of the Cambridge-MIT Institute. Since completing her PhD she briefly worked for the World Bank, before joining the Programme on Regional Innovation of the Cambridge-MIT Institute in 2006. Her research interests include regional economic growth, regional development policies, spatial modelling of growth processes and the drivers of regional innovation.

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