Handbook of Regional Growth and Development Theories

Edited by Roberta Capello and Peter Nijkamp

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HANDBOOK OF REGIONAL GROWTH AND DEVELOPMENT THEORIES

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Contents

Introduction: regional growth and development theories in the twenty-first century – recent theoretical advances and future challenges

Roberta Capello and Peter Nijkamp

I.1 The resurgence of regional economics

Regional economics is back on the stage. Regional development is not only an efficiency issue in economic policy, it is also an equity issue due to the fact that economic development normally exhibits a significant degree of spatial variability. Over the past decades this empirical fact has prompted various strands of research literature, in particular the measurement of interregional disparity, the causal explanation for the emergence or persistent presence of spatial variability in economic development, and the impact assessment of policy measures aimed at coping with undesirable spatial inequity conditions. The study of socio-economic processes and inequalities at meso and regional levels positions regions at the core places of policy action and hence warrants intensive conceptual and applied research efforts.

For decades, the unequal distribution of welfare among regions and/or cities has been a source of concern for both policy-makers and researchers. 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 thereof) as a statistical approximation (see Stimson et al., 2006). Sometimes alternative or complementary measures are also used, such as per capita consumption, poverty rates, unemployment rates, labour 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) (see for example Cameron, 2005). In all cases, however, spatial disparity indicators show much variability.

Regional disparities may have significant negative socio-economic cost consequences, for instance, because of social welfare transfers, inefficient production systems (for example due to an inefficient allocation of resources) and undesirable social conditions (see Gilles, 1998). Given a neoclassical framework of analysis, these disparities (for example in terms of per capita income) are assumed to vanish in the long run, because of the spatial mobility of production factors which causes at the end an equalization of factor productivity in all regions. Clearly, long-range factors such as education, research and development (R&D) and technology play a critical structural role in this context. In the short run, however, regional disparities may show rather persistent trends (see also Patuelli, 2007).

Disparities can be measured in various relevant categories, such as (un)employment, income, investment, growth, and so on. Clearly, such indicators are not entirely independent, as is, for instance, illustrated in Okun's law, which assumes a relationship between economic output and unemployment (see Okun, 1970; Paldam, 1987). Convergence of regional disparities is clearly a complex phenomenon which refers to the mechanisms through which differences in welfare between regions may vanish (see Armstrong, 1995). In the convergence debate, we observe increasingly more attention for the openness of spatial systems, reflected *inter alia* in trade, labour mobility, commuting, and so on (see for example, Magrini, 2004). In a comparative static sense, convergence may have varying meanings in a discussion on a possible reduction in spatial disparities among regions, in particular (see also Barro and Sala-i-Martin, 1992; Baumol, 1986; Bernard and Durlauf, 1996; Boldrin and Canova, 2001):

- β-convergence: a negative relationship between per capita income growth and the level of per capita income in the initial period (for example, poor regions grow faster than initially rich regions);
- σ-convergence: a decline in the dispersion of per capita income between regions over time.

The convergence hypothesis in neoclassical economics has been widely accepted in the literature, but is critically dependent on two hypotheses (see Cheshire and Carbonaro, 1995; Dewhurst and Mutis-Gaitan, 1995):

- diminishing returns to scale, which means that output growth will be less than proportional with respect to capital growth;
- technological progress will generate benefits that also decrease with its accumulation (that is, diminishing returns).

Many studies have been carried out to estimate the degree of β-convergence and σ-convergence (see for example Barro and Sala-i-Martin, 1991, 1992). The general findings are that the rate of β-convergence is in the order of magnitude of 2 per cent annually, while the degree of σ-convergence tends to decline over time, for both US states and European regions. Clearly, there is still an ongoing debate worldwide on the type of convergence, its speed, its multidimensional conceptualization, and its causal significance in the context of regional policy measures (see for example Fagerberg and Verspagen, 1996; Fingleton, 1999; Galor, 1996). Important research topics in the current literature appear to be: the role of knowledge and entrepreneurship, spatial heterogeneity in locational or socio-cultural conditions, and institutional and physical barriers. An important new topic in the field has become group convergence (or club convergence) (see for example Islam, 2003; Fischer and Stirbock, 2006; Baumont et al., 2003; Chatterji, 1992; Chatterji and Dewhurst, 1996; López-Bazo et al., 1999; Quah, 1996; Rey and Montouri, 1999; Sala-i-Martin, 1996). Thus we may conclude that the research field of spatial disparities is still developing and is prompting fascinating policy issues.

In the light of the previous observations, it is no surprise that over the last decade a resurgence of interest in regional science has taken place, from both theoretical and policy perspectives. This is particularly evident in the case of Europe. One of the main reasons

for such a renewed interest also relates to recent institutional agreements: in May 2004 and in January 2007 the European Union recorded two important historic enlargements, achieving respectively 25 and 27 EU member states. Most of the Eastern European countries joined the European Union, with the consequence of a drastic increase in regional disparities. In May 2004 the enlargement added 5 per cent to the GDP of the EU and 20 per cent to its population; as a consequence, however, the per capita GDP dropped by 12.5 per cent on the day of the enlargement. In January 2007, with the entrance of Romania and Bulgaria, the situation became even worse. Social, economic and demographic disparities call nowadays for sound regional policies.

Clearly, old issues, like regional disparities and convergence, are not the only reasons explaining the resurgence of regional science. Interestingly enough, in recent times, new normative principles in relation to regional development in the European Union have been proposed in official documents; 'territorial cohesion' is quoted in the official EU policy documents as a strategic principle, as strategic as the Lisbon and Gothenburg principles (Luxembourg Presidency, 2005a, 2005b): 'In practical terms territorial cohesion implies: *focusing regional and national territorial development policies* on better exploiting regional potentials and territorial capital – Europe's territorial and cultural diversity; *better positioning of regions in Europe* . . . facilitating their connectivity and territorial integration; and *promoting the coherence of EU policies with a territorial impact*' (p. I). Given the strong attention given by policy-makers to territorial aspects, regional science (and within it, regional economics) has to provide solid theoretical and methodological tools upon which normative policies can be built.

The interest of policy-makers for territorial and regional issues partly explains the resurgence of interest in regional science, and regional economics. Besides policy issues, in the academic arena much interest over the 1990s has also arisen in spatial phenomena: the role of space, highly neglected by mainstream economists, has now become a source of scientific thinking within traditional macroeconomic, international and industrial economic disciplines, giving rise to partly new and partly revisited theories. The degree of convergence and cross-fertilization of ideas between regional economists and the mainstream economists is still an open debate.

Moreover, in a period of globalization like the present one, and the creation of broad single-currency areas, regions (and also nations) must closely concern themselves with the competitiveness of their production systems, because no spontaneous or automatic adjustment mechanism is at work to counterbalance a lack (or an insufficient growth rate) of productivity. Local specificities and local material and non-material assets become strategic elements upon which the competitiveness of regions is based. Theories of regional growth and development need to be able to interpret, more than ever, the way in which regions achieve a role in the international division of labour and, more importantly, the way in which regions can maintain this role over time.

The focus of this volume is to collect the most advanced theories explaining regional growth and local development, with the intention to highlight: (1) the recent advances in theories; (2) the normative potentialities of these theories; (3) the cross-fertilization of ideas among regional economists and mainstream economists.

The aim of this introductory chapter is to summarize the main messages emerging from a package of 25 chapters present in the book, leaving each single chapter to present underlying theories and principles in more detail. Section I.2 will now present the

Table I.1 Main tendencies in theories of regional economics

Tendencies in theories	Regional growth theories	Regional development theories
More realism in theoretical approaches	Endogenous growth determinants A role in growth models of the complex non-linear and interactive behaviours and processes that take place in space Imperfect market conditions in growth models Growth as a long-term competitiveness issue Technological progress as an endogenous factor of growth	Reasons of success and failure of SME cluster areas, local districts, milieux Non-material resources as sources of regional competitiveness An active role of space in knowledge creation
Dynamic rather than static approaches	Evolutionary trajectories of non-linear interdependencies of complex systems	Dynamic rather than static agglomeration economies

Source: Capello (2008).

theoretical progress recently achieved in different parts of the world; section I.3 will then deal with future challenges in this field; while section I.4 will present the main structure of the book.

I.2 Recent theoretical directions

The great number of relatively new and advanced contributions in the fields of regional development and growth theories does not allow for a detailed review on all individual achievements made; in addition, a disaggregated analysis of all novelties would probably not be so stimulating. Our impression is that an attempt to highlight general theoretical trends will turn out to be more fruitful for a debate on present weaknesses and on possible future directions of regional economics. Inevitably, the set of 'tendencies' that follows is both selective and incomplete, primarily reflecting personal views and research interests (Table I.1) (Capello, 2008).

By looking at the theoretical trajectories followed in regional economics, one of the major tendencies which has accompanied the theoretical development in the field is the need for more realism in sometimes rather abstract conceptual approaches, by relaxing most of the glaring unrealistic assumptions of the basic theoretical models, a tendency common also in urban economics (Capello and Nijkamp, 2004). This tendency is justified by the need to broaden the interpretative capacity of the theoretical toolbox in this research field by searching for theories that are better able to reflect the real world.

In regional growth theories, more realism has required the insertion of the complex non-linear and interactive behaviours and processes that take place in space into growth models, and the understanding of regional competitiveness in terms of endogenous factors. The question of whether a region is intrinsically capable of growing as a result of endogenous forces has been a source of debate for decades; industrial specialization, infrastructure endowment, central location, production factor endowment or agglomeration

economies have alternatively been emphasized in the academic arena as driving forces of local economic success.

The decisive step forward in this field has been the focus on economies of scale in production which, together with non-linear transportation costs, are introduced into a (quantitative) interregional growth model; the final spatial distribution of activities critically depends on initial conditions including the starting distribution of activities and the nature of the non-linearities embedded in the activity–transportation interactions, which give rise to multiple equilibria (Krugman, 1991). The additional value of this approach – known as the 'new economic geography' – resides in skilfully modelling the interaction between transportation costs and economies of scale in production, although the determinants of endogenous growth have already long since been emphasized, starting from the Myrdal–Kaldor model (increasing returns, cumulative self-reinforcing growth patterns). The aim to incorporate agglomeration economies – in the form of increasing returns – into elegant models of a strictly macroeconomic nature was made possible by advances in more sophisticated mathematical tools for analysis of the qualitative behaviour of dynamic non-linear systems (bifurcation, catastrophe and chaos theory) together with the advent of formalized economic models which abandoned the hypotheses of constant returns and perfect competition (Fujita and Thisse, 1996, 2002).

These new theoretical advances required a new conceptualization of space, that of a diversified-stylized space (see Capello, this volume). Space is, in these new theories of local growth, a diversified space, since the existence of polarities in space is envisaged where development takes place, diversifying the level and rate of income growth even among areas of the same region. However, it is a stylized space, since polarities are treated as points devoid of any territorial dimension. This approach moves away from the concept of a uniform-abstract space of growth theories developed in the 1950s and 1960s; the label 'uniform' stems from the fact that in these theories supply conditions (factor endowment, sectoral and productive structure) and demand conditions (consumer tastes and preferences) are identical everywhere in the region; abstract, since simplifying assumptions are inserted so as to cope with place-specific conditions (see Capello, 2007a and Chapter 2 in this volume).

In parallel with Krugman's efforts, in the field of endogenous determinants great emphasis has recently been put on knowledge as a driving force to development, and, what is really new, on the endogenous self-reinforcing mechanisms of knowledge creation. Macroeconomic models of endogenous growth, where knowledge is generally embedded in human capital (Romer, 1986; Lucas, 1988), have widely dominated the academic arena in the 1990s. Their main aim was to insert more realism into growth models by relaxing the unrealistic assumption that technological progress is an exogenous process in an economic system; in the new growth theories, instead, technological progress is an endogenous response of economic actors in a competitive environment. More specifically, increasing returns in factor productivity stemming from endogenous factors – such as innovation, scale economies and learning processes – are included in a neoclassical production function, where they offset the effect of the marginal productivity of the individual factors, which the traditional neoclassical approach assumes to be decreasing.

The identification of endogenous determinants of growth was the crucial scientific issue that explained the birth of regional development theories. Development is in fact by definition endogenous. It is fundamentally dependent on a concentrated organization of

the territory, embedded in which is a socio-economic and cultural system whose components determine the success of the local economy: entrepreneurial ability, local production factors (labour and capital), relational skills of local actors generating cumulative knowledge-acquisition and, moreover, a decision-making capacity which enables local economic and social actors to guide the development process, support it when undergoing change and innovation, and enrich it with the external information and knowledge required to harness it to the general process of growth, and to the social, technological and cultural transformation of the world economy. The micro-behavioural nature of these approaches allows a deep understanding of the sources of territorial externalities, of increasing returns in the form of agglomeration economies, at the basis of industrial cluster formation. Within this approach, much emphasis is given to the role of entrepreneurship in regional development (Nijkamp and Stough, 2004).

More realism in the study of clusters and their determinants called for a better understanding of successes and failures of local productive systems, hardly explained in the first theories proposed. Dynamic agglomeration economies – defined as territorial advantages that act on the capacity of firms and regions to innovate – become the centre of most recent theoretical reflections in this field, giving rise to neo-Schumpeterian approaches in regional development. A major debate dominates the academic arena, with the aim to identify the role of space in innovative processes.

In the vast literature created in this field, the endogenous determinants of innovation are increasing returns in the form of dynamic location advantages deriving from:[1] (1) spatial, geographical proximity among firms, which facilitates the exchange of tacit knowledge: this characterizes reflection by economic geographers concerned to explain the concentration of innovative activities; (2) relational proximity among firms, defined as interaction and cooperativeness among local agents, the source of collective learning processes and socialization to the risk of innovation (that is, territorialized relations among subjects operating in geographical and social proximity): this was the approach taken by territorial economists in explaining the dynamic of local systems in terms of local innovative capacity; (3) institutional proximity taking the form of rules, codes and norms of behaviour which facilitate cooperation among actors and therefore the socialization of knowledge and assist economic actors (individual people, firms and local institutions) to develop organizational forms which support interactive learning processes: this aspect was emphasized by more systemic approaches seeking to understand the evolution of complex systems like the innovative system.

A second clear tendency in theoretical developments – typical of regional development and growth theories only – has been the attempts to move towards dynamic approaches. Time matters as well as space in regional science, and this also holds in regional economics. The effort to encapsulate time in spatial analyses has taken place in two different ways, according to two different meanings of time applied in the two fields of analysis: a more traditional chronological time, and time as rhythm of innovative phenomena which occur in the territory which has been applied in regional growth models.

The introduction of a chronological time within spatial analysis is not at all a simple task, since it requires a mathematical and methodological toolbox, only recently available to regional scientists. Theories on non-linear regional dynamics – framed in the context of chaos theory, synergetics theory or predator–prey analysis – may be mentioned here (see Nijkamp and Reggiani, 1999). In growth models, until a few years ago, the large

majority of experiments and applications has taken for granted the existence of linear – and thus regular – growth processes. Linear models are certainly able to generate unstable solutions, but the solutions of such models are restricted to certain regular standard types. Such models may provide approximate replications of short- and medium-run changes, but fail to encapsulate long-term developments characterized by structural shifts of an irregular nature. This limit has recently been overcome with the adoption of non-linear models, which allow for a change in the dynamics of a system generated even by small perturbations in structural forms; structural instability means the possible existence of significant qualitative changes in the behaviour of the system (that is, in the state variables) that are closely connected with bifurcation and catastrophe phenomena that can occur if the parameter values (that is, the control variable) are changing (see Fujita and Thisse, 1996, 2002). The application of non-linear models to the well-known neoclassical and Keynesian models has shown that the deterministic and unique results achieved by the dynamic linear models are no longer guaranteed: interregional income convergence determined by the traditional neoclassical model collapses and opens the way to alternative possible trajectories, and equilibria solutions; non-linear Keynesian Myrdal–Kaldor models substitute the deterministic result of continuous growth or decline with new and opposite development trajectories, after catastrophe phenomena occur (Miyao, 1984, 1987a, 1987b).

Such a theoretical improvement has also been useful in achieving a greater realism of these models, able to incorporate the dynamic interactions between the components of a spatial system. Dynamic interactions are functionally determined by interdependencies between the behaviour of actors and distance frictions. Such spatial interactions may be stable in nature (that is, operating under fixed external conditions) or subject to change as a result of dissipative evolutionary processes in the external world. In the latter case, model parameters become time-dependent, so that non-linear complex dynamics may emerge (see Puu, 1991; Nijkamp and Reggiani, 1993, 1999; Nijkamp, 2006).

In the field of regional development, conceptually speaking a different concept of time has been developed and applied; time à la Bergson–Heidegger is interpreted as duration and a continuous process of creation, characterized by discontinuity, irreversibility, sequentiality and cumulativity. Time has thus been conceived by an important part of regional studies as the pace of learning, innovation and creation processes. Local clusters (and industrial districts) are by definition the loci where learning and cumulative learning processes take place; the identification of the sources and of the endogenous determinants of such processes, besides simple physical proximity, represents a great challenge for regional economists. Knowledge spillovers, collective learning, learning regions (or learning space) and knowledge-based regions are all theories that embrace the most advanced perspectives in this direction. In these theoretical approaches, therefore, innovation has become the critical survival factor in a competitive space-economy and determines the direction and pace of regional development (Nijkamp and Abreu, 2008).

I.3 Future challenges

Fascinating new theoretical challenges are nowadays faced by regional scientists, and have to be addressed. A first challenge is proposed by the attempt to obtain advantages by a future convergence in different theoretical approaches, a convergence only partially obtained by the new regional growth theories. New growth theories make a commendable