THEORIES OF REGIONAL ECONOMIC DEVELOPMENT: A BRIEF SURVEY

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Abstract

The purpose of this paper is to provide a survey of the major theories of regional economic development that have guided the strategies and programs of regional economic development put in place over the last decades.

The goal of this survey is fourfold. The first is to identify the major features of each theory. The second is to highlight similarities and contrasts among them.

The third is to assess their major strengths and weaknesses with a view to underline the regional context where such theories can provide a better framework for regional analysis.

The fourth is to discuss the factors missing in the mainstream theories of regional development that recent empirical evidence has demonstrated to play a crucial role in regional development in an era of economic globalization. Among them, and of particular relevance for regions located in developed economies, are: institutional framework, local innovative milieu and technological competitiveness, and local entrepreneurial capacity.

Sumário

Este artigo oferece uma síntese das principais teorias de desenvolvimento regional que têm servido de orientação a estratégias e programas de desenvolvimento regional e local levadas a cabo ao longo das últimas décadas.

Quatro objectivos principais estão subjacentes a esta síntese. O primeiro é apresentar as principais características das várias

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teorias de desenvolvimento regional. O segundo é destacar as semelhanças e contrastes entre elas.

O terceiro é avaliar os seus principais pontos fortes e pontos fracos tendo em vista salientar o contexto regional em que cada teoria oferece um melhor enquadramento de análise.

O quarto é discutir os factores ignorados pelas principais teorias de desenvolvimento regional que a evidência empírica recente tem demonstrado terem um papel fundamental no desenvolvimento regional numa era de globalização económica. Entre eles, e com particular relevância para regiões localizadas em economias desenvolvidas, estão o enquadramento institucional, a existência de um "milieu" local propício à inovação e à competitividade tecnológica, e a capacidade empresarial local.

Introduction

Stretching back at least 50 years, research on regional economic development has generated many different theories, some borrowed from the nation-level development theories, others focused particularly on the regional context.

It is possible to identify nine main theoretical frameworks, each one giving rise to different theories and models of regional development: (1) firm location theory; (2) traditional neoclassical theories; (3) Keynesian theories; (4) core-periphery theories; (5) functional development theory; (6) stage theory; (7) disequilibrium theories; (8) endogenous growth theory; and (9) new economic geography theory.

As a rule, the models and theories of regional development are rooted in a combination of both economies and diseconomies of agglomeration. Agglomeration economies refer to the economic benefits of size and diversity – either decrease in production costs, increase in production efficiency, or increase in productivity – brought about by the spatial concentration of economic activity and population. On the other hand, the spatial concentration of people and economic activity can bring about diseconomies of agglomeration – e.g., price increase of less mobile and scarcer factors such as land and labor and congestion problems such as noise, air pollution, crime, social malaise – pushing for dispersion and de-concentration of economic activity, employment, and population to less congested places (Capello 2007a, Castells 1996, Massey *et al*. 1999).

The several theories of regional development differ in the assumptions they make with respect to the balance between agglomerating and dispersing forces and the development forces other than agglomerating/dispersing forces they emphasize.

What follows is a summary of the major principles and concepts of these theories as well as an assessment of their major strengths and weaknesses. It is also discussed the variables missing in the theories reviewed that recent empirical studies and regional development experiences have demonstrated to play a crucial role in regional development.

Firm Location Theory

Models of regional development inspired by firm location theory assume that regional development is largely dependent upon the existence of firms in the region. In such models, regional development is, therefore, a function of the factors firms consider when choosing where to locate.

In its traditional formulation – largely influenced by the pioneer works of Alfred Weber in the 1910s, Andreas Predohl in the 1920s, and August Losch in the 1940s – the firm's location decision problem is modeled as a simple transportation costs minimization problem. Therefore, the distance to customers, the distance to inputs, and transportation costs are central elements of a firm's decision location model. The firm's location, then, is the place where total transportation costs are minimized. Most of the regional development models, inspired by location theory and developed prior to 1960, adopted a transportation cost minimization framework (Isard 1949, Izard 1975, Hoover 1948).

In regional economics location theory evolved from simple transportation cost minimization models to more realistic location decision models incorporating a myriad of additional factors that empirical evidence has demonstrated to be significant locational factors. The extensions have included, among others, spatial variations in market size, production cost differentials, availability (and cost) of labor, technical competence of the labor force, technological capabilities, regional amenities and quality of life, regional business climate, and local taxes. As the realism of location theory increased so too did the complexity of the location decision models, which are increasingly less theoretical deterministic models of

where firms decide to locate. More recent models of regional development inspired by firm location theory admit that other factors such as inertia, agglomeration economies, chance, and institutional framework can play a role in where firms choose to locate as well (Blair and Premus 1993, Diken 2007, Gordon and McCann 2000).

Traditional Neoclassical Theories

Broadly speaking, the theories of regional development rooted in a traditional neoclassical framework assume that the key determinants of regional development are factors endowment and productivity because these are the determinants of long-run growth of the supply capacity. These models also assume free trade among regions, perfect competition, perfect information, technological progress exogenously determined, and an equilibrium growth path leading to a convergence of growth rates among regions (Cheshire and Malecki 2004). Among the theories of regional development emerging from this framework are (1) the Borts and Stein model and (2) the factor price equalization theory.

Borts and Stein Model

The model of regional development developed by George Borts and Jerome Stein in the 1960s is a simple adaptation of Solow's (1956) neoclassical growth model to a regional context by allowing for production factors mobility. According to this model regional development is determined by the long-run growth rate of the supply capacity which, in turn, is determined by the combined growth of the capital stock, labor supply, and productivity which depends on technical progress. Technical progress is considered exogenous to the development process and determined largely by non-economic forces. The production factors labor and capital are mobile among regions. Therefore, investment from outside and migration are the only inducing factors that can stimulate regional development since technical progress, the source of productivity growth, is determined by exogenous factors (Borts and Stein 1964, Cheshire and Malecki 2004).

Factor Price Equalization Theory

The regional development theory of factor price equalization derived from the works of Eli Heckscher (in the 1910s), Bertil Ohlin (in the 1930s), and Bela Balassa (in the 1960s) suggests that regional development occurs as a process of factor prices equalization among regions.[1] According to this theory, investment tends to flow from leading to lagging regions where the lower prices of production factors (e.g., labor, land, or energy) allow greater returns on investment. As investment in lagging regions increases, so does the competition for production factors, which results in increasing factor prices and decreasing returns on investments. Over time, factor prices and return on investments tend to equalize over regions (NELSON 1993).

The major strength of the regional development theories grounded in a traditional neoclassical approach is the emphasis on productivity and technological progress as major sources of economic development. Their major limitations derive from the strong hypotheses these models are built upon which are not verifiable in most regional economies. Of particular relevance for regional development are the (unrealistic) assumptions of (1) the exogenous nature of technological progress and (2) constant returns to scale, which imply that agglomeration economies and economies of scale are assumed not to exist or not to matter for regional development.

Keynesian Theories

By contrast to the neoclassical view, which puts the emphasis on factors affecting supply capacity as the major determinants of regional development, Keynesian theories assume that regional development is largely demand driven. Two main regional development theories fall into this framework: (1) export-base theory and (2) input-output theory.

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[1] These models were originally developed to explain international development patterns but they have been used as a framework to explain the development of regions within a nation as well.

Export-Base Theory

The export-base theory, developed by John Alexander, Douglass North, and Charles Tiebout in the 1950s, assumes that regional economic activity can be divided between activities producing goods and services for export to other regions (basic activities or export base) and activities producing goods and services for local consumption (non-basic activities). The key feature of this theory is that it considers exports the major driver of regional development because exports have a regional multiplying effect. The expansion of the regional export base means that funds flow into the regional economy from the sale of locally produced goods and services to customers outside the region. These externally generated funds boost local demand for local-oriented (non-basic) activities. The initial and subsequent rounds of spending (indirect and induced effects) derived from the initial expansion in the export base have a multiplier effect on the non-basic activities thereby creating economic development (Kriklas 1992, Tiebout 1956, Stimson *et al*. 2006).

Therefore, according to this theory the economic development of a region depends on the region's ability to develop and sustain an export base capable of producing goods and services in demand outside the region. Non-basic activities are largely dependent on export activities and thereby play a minor role in regional development.

The major strength of the economic-base theory is the emphasis given to regional competitive advantages as the ultimate fundamental source of regional development. The profit opportunities offered by the region's competitive advantages in activities capable of producing goods and services in demand outside the region attract capital and labor into the region from outside which, in turn, boost the economic development of the region (North 1956).

The export-base theory has some limitations as well. First, as a demand-driven theory it pays little, if any, attention to the supply-side conditions a region must offer in order to be able to fully exploit its competitive advantages and/or to create new competitive advantages. Such supply-side conditions include, among others, physical infrastructure, accessibility to external markets, financial resources, labor force skills, entrepreneurial capacity, local amenities, and institutional framework. Second, it assumes that all export activities are equally important in boosting regional development because they all have similar multiplier effects on non-basic activities.

Input-Output Theory

The demand-driven input-output theory, developed by Wassily Leontief in the 1940s, differs from the export-base theory by assuming that different activities have different multiplier effects in the local economy. This implies that not all export-oriented activities have the same effect on regional development. The distinct local multiplier effects depend, according to the input-output theory, on the local industrial mix and on the local inter-industry linkages. Therefore, regional economic development depends on the region's ability to develop and sustain (1) export activities with dense local inter-industry linkages, and/or (2) import substitution activities that limit the income leakage to other regions and simultaneously strengthen the local inter industry-linkages, and/or (3) intermediate activities with backward and forward linkages to both export-oriented and local-oriented activities (HOOVER 1975, STIMSON *et al*. 2006).

The input-output theory has the major advantage of highlighting that regional development can be enhanced if, in parallel with developing an export base, the regional economy is able to develop local intermediate suppliers which may or may not be export-oriented per se. This will generate stronger and more complex backward and forward intra-industry linkages thereby expanding the local multiplier effect of exports.

Like the export-base theory, the major drawback of the input-output theory is that it is not concerned with the supply-side conditions a region must have in place to be able to develop and sustain a dense network of local activities that includes export-oriented activities, local-oriented activities, and intermediate suppliers to both exports and local activities.

Core-Periphery Theories

The core-periphery theories of regional development depart from the assumption that there are advanced (leading) regions and underdeveloped (lagging) regions. In a clear contrast with traditional neoclassical approach which assumes that regions tend to converge to similar long-run growth rates, core-periphery theories see regional development as inherently uneven. The several core-periphery theories differ in the assumptions they make with respect to the linkages between leading and

lagging regions. It is possible to identify three major theories within this approach: (1) theory of cumulative causation, (2) growth pole/growth center theory, and (3) central place theory.

Theory of Cumulative Causation

The theory of cumulative causation, developed by Gunnar Myrdal in the 1950s, emphasizes the polarizing effects of leading regions over lagging regions. Some places (leading regions) possess initial comparative advantages due to, for example, location, infrastructure, and size. Agglomeration economies reinforce these comparative advantages and pull in capital, skills and expertise, with backward effects preventing the lagging regions from developing the internal capacity to compete and prosper. Skilled workers, educated people, business leaders, and capital that may emerge in lagging regions will flow to leading regions where the returns are higher. Little investment moves from leading regions to lagging regions. Investment that occurs is controlled by leading region elites to assure economic dominance. In addition, goods and services produced in the leading regions are sold to the lagging regions at such low prices that local industries cannot compete. This theory also concedes that leading regions can spread out into lagging regions that have some comparative advantage. Lagging regions can have some comparative advantage, e.g., natural resources or a large labor pool, which can cause a positive investment flow into the region. The lagging region will develop when the spread effects become stronger than the polarizing effects (Myrdal 1957, Nelson 1993, Stimson *et al.* 2006).

The theory of cumulative causation has the merit of offering one possible explanation why regional convergence is far from being a natural long run outcome of the development process. As the theory suggests, agglomeration economies can reinforce the competitive advantages of leading regions and the polarizing effects can inhibit the development of lagging regions. One of the shortcomings of this theory is the limited role given to the spillover effects of leading regions into lagging regions. They seem to occur just through investments seeking to exploit a comparative advantage the lagging region might have.

Growth Pole/Growth Center Theory

The growth pole theory, first introduced in regional economics by Perroux in the 1950s, argues that by concentrating its efforts on a specific

sector or a limited number of sectors with high potential for growth, the growth pole, a region can initiate propulsive development. As the "pole" expands, the local inter-industry linkages are intensified through import substitution thereby causing regional economic development. Usually, the selected growth pole is a region's leading export industry because it has larger spillover and multiplier effects on other industries.

Largely as a result of the works of Albert Hirschman also in the 1950s, the growth pole theory has also been applied to urban nodes, which is termed in the literature as growth center theory. In this context, the theory argues that regional development efforts should be concentrated in a few urban nodes, those with greater growth potential. As these urban nodes expand, economic growth spills over to adjacent regions through a process of de-concentration of economic activity and/or population from the growth center to the peripheries (DARWENT 1969, HANSEN 1975, RICHARDSON 1979).

The growth pole/growth center theory has the merit of highlighting that scarce resources have the potential of generating greater returns in terms of economic development if concentrated in sectors/urban nodes that have greater growth potential.

Like the theory of cumulative causation, the growth pole/growth center theory assumes that growth and development can be unbalanced, either over region or over sectors. By targeting particular poles (sectors or urban centers) this theory is assuming that the benefits accrue initially to that pole enhanced by polarizing effects. The trickling-down benefits come later to the other sectors or parts of the region. Although the theory assumes that the trickling-down effects will occur later and eventually will surpass the polarizing effects, in practice nothing guarantees that this is the case. Polarizing effects can be stronger than the trickling-down effects over time and, as a result, the initial unbalanced growth can become the norm or be even aggravated.

Central Place Theory

The central place theory, developed by Walter Christaller and August Losch in the 1930s and 1940s, argues that the development efforts and investments should be concentrated in a limited number of growth points organized in a hierarchical and functionally integrated way. In this view, regional development occurs in a matrix of growth points which are the

building blocks around which the regional economic base will cluster. In identifying a hierarchical system of growth points three things are necessary. One is to define the minimum population size an urban region must have to qualify as a candidate for a growth point. The second is to select as major growth points those candidates having the greatest potential for future economic growth. The third is to establish a hierarchy among the selected growth points based on their different sizes and thereby different areas of influence. Higher-order growth points should be assigned a higher number and order of critical service functions and thereby higher developmental efforts and investments on the basis of estimated population-service ratios. Critical services may include: (1) secondary schools, (2) vocational training schools, (3) technical research facilities, (4) health facilities, (5) housing, (6) utilities (e.g., sewerage and water supply system, energy system, and telecommunications system), and (7) information and communication services, and (8) recreational and cultural facilities. The several hierarchical levels of growth points must be connected by a transportation network to provide for the maximum access of population to the different growth point levels and thereby different levels of critical services (Getis and Getis 1970, King 1984).

The central place theory shares with the growth pole/growth center theory the principle that some urban agglomerations are the engine of development and this development impacts surrounding lagging regions through a combination of trickling-down and polarizing effects. It adds to the growth pole/growth center theory the important notion that not all growth points are equally important in promoting regional development. Regional development is maximized if the developmental efforts, functions, and services provided by the growth points are hierarchically organized.

Functional Development Theory

The functional development theory suggested by John Friedmann, Clyde Weaver, and Walter Stohr, in the 1970s departs from the assumption that regional development can be achieved by harnessing selected regional resources to create generative growth. This theory assumes that it is possible to move a region to higher stages of development by organizing it around a principal function closely related with its resources

endowment. For that, the lagging region relies on investments funds originated in leading regions. In addition, several efforts should be made to reduce imports of goods and services and to reinvest locally the regionally created savings. This theory envisages the existence of a decentralized regional administrative organization to coordinate such efforts. This organization should be supported by local and state governments and by local business groups. The Tennessee Valley Authority and the Bonneville Power Administration are considered two U.S. examples of regional development strategies based on the functional development theory (FRIEDMAN and WEAVER 1979, NELSON 1993).

One of the strongest points of this theory is the idea that regions themselves must play an important role in influencing the character of their own development. The functional development theory assumes that regional development should fit regional character. For that, regional communities must be involved in both defining social and economic goals and objectives and tailoring the development patterns. One of its weaknesses is that it is just applicable in regions that have at least one resource endowment economically relevant enough to become the engine of local development. Such a resource can be (1) a natural resource (e.g., land, water, oil, or wood), (2) a strategic geographic location, (3) climate, (4) a pool of cheap labor, (5) a pool of skilled labor, (6) a knowledge pool (e.g., a pool of universities and research facilities), or (7) a pool of specialized skills and expertise on a particular industry that can be leveraged to higher value added activities (for example, expertise in the clock industry can be leveraged to high-precision surgical instruments).

Stage Theory

The stage theory developed by Walter Rostow in the 1960s assumes that regional development occurs through stages of growth. According to this theory, there are five stages of regional development: (1) traditional, (2) preconditions for takeoff, (3) takeoff, (4) maturity, and (5) mass consumption. A region develops by evolving from lower stages to higher stages of development. The progression from one stage to another is not automatic. It may be delayed or rendered unachievable for a variety of reasons.

A region in the traditional stage of development is one in which there is limited availability of technology relative to other regions and probably a

rigid and hierarchical social structure. The region enters the second stage of development when investments flow into the region for the purpose of exploiting its natural resources. Industrial investments are accompanied by investments in basic physical infrastructure such as transportation and communication. In addition, managers and skilled labor are transferred to the region to lead the new industrial investments. As a result, the region's economic and social structure begins to change and a new social and political elite emerges. Takeoff occurs when an external stimulus, such as a development program or a major private investment, brings investment into the region and the new local social and political order is able to sustain that investment. A region enters the maturity stage when it achieves a diversified economic base and complex local inter-industry linkages. As a result, the region is able to produce locally many formerly imported goods and services. Finally, the mass consumption stage occurs when a region exports many goods and services that it formerly imported. In this stage the local economic base has to be both diversified and sophisticated enough in order to produce goods and services that can compete in the external markets (Nelson 1993, Rostow 1960).

The stage theory has the important advantage of making clear that the magnitude of the multiplier and spillover effects predicted by other theories of regional development depends upon the region's stage of development. One corollary of the stage theory is that in lower stages of development the regional industrial mix is less diversified and sophisticated and the local inter-industry linkages are weaker. As a result, the magnitude of the multiplier effects predicted by the export-base and input-output theories, as well as the multiplier and spillover effects predicted by the growth pole/growth center theory and central place theory, are likely to be smaller in lower stages than in higher stages of development. Ultimately, the stage theory suggests that strategies and programs seeking to promote regional development should be tailored to fit the region's stage of development.

One important limitation of the stage theory is its deterministic nature. This theory assumes that the process of regional development always follows the five stages identified above. It does not consider the possibility that some regions can skip some stages and, for example, move from the traditional stage to the takeoff stage without experiencing the takeoff preconditions stage. A second limitation of this theory is its non-reverse nature. The stage theory provides a framework explaining

how regions progress. It assumes that a region can either progress from lower stages to higher stages or stagnate in one stage of development. It fails to explain declining regional economies as a result, for example, of an obsolete economic structure.

Disequilibrium Theories

The disequilibrium theories of regional development depart from the assumption that regional development is boosted by disequilibrating forces. Three major theories of regional development fit within this approach: (1) Schumpeterian dynamic disequilibrium, (2) regional life cycle theory, and (3) product life-cycle theory.

Schumpeterian Dynamic Disequilibrium Theory

The Schumpeterian dynamic disequilibrium theory of regional development builds upon Joseph Schumpeter's view of the market system as a process of "creative destruction" where old systems are destroyed and replaced by new ones. This theory, set forth in the 1930s and 1940s, assumes that regional development is the result of dynamic disequilibrating forces that render obsolete the productive structure of leading regions and favor the competitive advantages of lagging regions. Market dynamics cause obsolete products and processes to be replaced by more timely and efficient ones. Technological developments may render the existing infrastructure of leading regions obsolete. On the other hand, investment in new industries may be more profitable in lagging regions. In addition, building new infrastructures may be more efficient in the lagging regions relative to tearing down and rebuilding new ones in leading regions. This dynamic process of "creative destruction" explains the development of regions over time (Nelson 1993, Schumpeter 1939).

Regional Life-Cycle Theory

Following a rather similar perspective, the regional life-cycle theory offered by Bernard Weinstein, Harold Gross and John Rees in the 1980s assumes that the development of any region evolves in waves of boom and bust in a way resembling Nikolai Kondratieff's long waves of develop-

ment. New enterprises emerge in lagging regions because leading regions are strapped with obsolete and unprofitable infrastructure and productive structure. Over time, newly developed regions will themselves decline and by that time bypassed regions will have reemerged (HALL 1990, REES 1979, WEINSTEIN *et al*. 1985).

Product Life-Cycle Theory

The product life-cycle theory introduced in the 1960s by Raymond Vernon and Seev Hirsch assumes that the different patterns of development among regions can be explained by the different stages of the product life-cycle in which they are specialized. According to the product life-cycle, a concept borrowed from marketing and international trade literature, a typical product evolves through three distinct stages in its life cycle: innovation, growth, and standardization. During the innovation stage the new product is both developed and manufactured in its home region since incremental innovations in the characteristics of the product are frequent and the production processes have not yet been standardized. The growth stage is characterized by significant growth in sales, the use of larger production facilities, and the occurrence of some incremental process innovations. The standardized stage is when the production process becomes standardized, no innovations take place either in the product or in the production process, and the sales either stabilize or start to decline. At this stage the production can be shifted to lower cost locations.

Using the product life-cycle framework regions can be designated as innovation-phase, growth-phase, or standardized-product regions corresponding to their tendency toward a particular phase in the product cycle. The innovation stage needs a high input of R&D and specialized skills. It is usually carried out in large urban areas of developed countries. The standardized production phase of the product life cycle can be transferred to low cost locations abroad or down the urban hierarchy to rural areas.

According to the product life-cycle theory of regional development, regions can change their roles over time. As production concentrates in lagging regions, human capital accumulation through learning by doing, personnel mobility, the development of local linkages and other external economies can build up there. As the region expands, regional demand

can increase to a critical threshold where an industrial seed bed effect can develop rapidly with the spin-off of small firms or through the immigration of entrepreneurs. This will cause lagging regions to develop and eventually to become an innovation-stage region (CAPELLO 2007a, MALECKI 1981, REES 2000).

These three disequilibrium theories of regional development aim at explaining why regions prosper and decline over time. In contrast with other theories of regional development, which implicitly or explicitly assume that leading regions will either develop or stagnate, e.g. the stage theory, the disequilibrium theories set forth the idea that over time lagging regions can bypass leading regions. The major flaw of disequilibrium theories is that they do not provide insights on what prerequisites lagging regions should have in place to become leading regions. These theories seem to assume that moving away from lagging to leading and vice-versa is a deterministic process that any region sooner or later will face and little if anything can be done to change this process.

Neoclassical Endogenous Growth Theories

In the late 1980s and early 1990s a large body of theoretical developments emerged in the literature as an attempt to introduce more realism in the traditional neoclassical theories. Many theorists have contributed to these developments, termed in the literature as "endogenous growth," namely Paul Romer, Gene Grossman, Elhanan Helpman, Robert Barro, and Robert Lucas. As expected, there have also been attempts to introduce endogenous growth concepts into the neoclassical-inspired theories of regional development. One of the first steps in that direction was the work of Stefano Magrini in the late 1990s.

The neoclassical endogenous growth theories of regional development modify the traditional neoclassical theories by making technical progress (and thereby productivity growth) endogenous to the economic process. Several models have been developed many substantially altering the traditional neoclassical framework by assuming imperfect competition and increasing returns to scale. They have also relied on distinct mathematical formulations and have assumed different simplifying hypothesis in an attempt to conceptualize the regional characteristics that can cause

technological change. Such conceptualization has included modeling technological change as a function of (1) human capital – stock and/or accumulation over time, (2) R&D, (3) innovation, (4) knowledge spillovers, and (5) technological spillovers.

In short, the endogenous growth theories of regional development see long-term regional growth as a result of accumulation of capital and labor (traditional neoclassical view) but also as a result of the regional characteristics in terms of human capital, R&D, innovation, knowledge, and some sort of knowledge and technological spillover effects (Grossman and Helpman 1994, Magrini 1997, OCDE 2009, Romer 1990, Romer 1994, Solow 1994).

One of the major contributions of these theories to regional development is the emphasis given to human capital, knowledge, and innovation as important drivers of long-term growth and development. A second important contribution is the acknowledgement that technology and knowledge generate spillover effects which, in turn, are important determinants of regional development by themselves. Their major shortcomings stem from the underlying assumption that regions always have in place the necessary conditions for the translation of human capital and R&D into productive innovations and productivity gains, as well as the conditions for the diffusion of knowledge and technology to occur.

New Economic Geography Theories

The new economic geography theories of regional development originated in the 1990s with the works of Paul Krugman and Anthony Venables integrate within a formal (mathematical) neoclassical framework the concepts of cumulative causation and agglomeration economies developed by the core-peripheries theories in the 1950s (Fujita and Thisse 2009). In so doing, the new economic geography theories of regional development change the traditional neoclassical model by assuming increasing returns to scale and imperfect competition in a context of interregional trade (Martin 1999).

The new economic geography approach focuses upon the balance between centripetal (agglomerating) and centrifugal (dispersing) forces in determining the extent and form of regional concentration of economic activities. Centripetal (agglomerating) forces, which tend toward spatial

concentration, include, according to these theories, (1) market size, (2) transportation costs, (3) cooperative and functional linkages between firms, (4) dense labor markets with a diversity of skills, and (5) external economies of scale such as knowledge spillover. Centrifugal (spillover) forces, those that tend toward spatial de-concentration, include (1) labor immobility, (2) lower land costs, (3) and external diseconomies of various sorts such as congestion (Hudson 2009, Martin 1999).

Among the range of centripetal and centrifugal forces, many of the models developed within this approach emphasize economies of agglomeration (modeled as increasing returns to scale) and transport costs – variables easy to measure and as such consistent with the mathematical formulation approach followed by these models. According to these theories, the tendency for spatial clustering of economic activities is positively correlated with agglomeration economies and negatively correlated with transport costs. In this view, growing regional divergence and a core-periphery pattern of economic development is a result of agglomeration. Cumulative growth in "core" regions occurs because firms benefit from cost savings and/or revenue increases there as a result of mutual interaction and interdependencies which leads to increased efficiency and comparative advantages.

More sophisticated models alter the traditional neoclassical framework by including more complex agglomerating (centripetal) forces such as labor market pooling, technological spillovers, intermediate goods supply and demand linkages, and market size. As centrifugal (dispersing) forces they consider product-market and factor-market competition.

Recent variants of the new economic geography models incorporate elements of the endogenous growth theory into the neoclassical model with increasing returns to scale. In so doing, they focus either on inter-regional transfers of human capital or localized technological progress as the mechanisms underlying the agglomeration of economic activity and the unequal development among cores and peripheries (Fujita and Thisse 2009, Hudson 2009, Martin 1999, Krugman 1991, Krugman 1996, Krugman and Venables 1996).

Though many of the concepts introduced by the new economic geography theories are not entirely new in the regional development realm, this approach has the advantage of refocusing the attention of mainstream neoclassical economics to a different (and more realistic) set of determinants of regional development. Instead of relying exclusively

on the accumulation of production factors capital and labor and exogenously-determined productivity growth (traditional neoclassical view), this approach emphasizes the importance of agglomeration and cumulative causation for regional economic development. As a result, it contributes to an explanation, under a formal neoclassical framework, of why regions have different patterns of development over time instead of converging to similar long-term growth rates as predicted by the traditional neoclassical theories of regional development.

One important limitation of the new economic geography theories is that they have relied extensively on mathematical modeling but are short on empirical testing and empirical application. These models are mathematically very complex, typically quite abstract and over simplified leaving several aspects held constant or simply ignored. Therefore, a meaningful application of these theories to or test against the real world is a very challenging task (Brakman and Garretsen 2006).

The Missing Variables in Mainstream Regional Development Theories

Both recent empirical evidence and the lessons learned from major past regional development programs suggest that several factors playing a crucial role in regional development have been ignored by mainstream theories of regional development. Among them are: institutional framework, local innovative milieu and technological competitiveness, and local entrepreneurial capacity.

Such factors are particularly important when businesses have to choose among locations in higher stages of economic development that already possess dense and sophisticated inter-industrial linkages, a relatively skilled labor force, and a good level of physical and social overhead capital. In addition, such locational factors are of particular relevance for the locational decisions of high-value, sophisticated, and knowledge-intensive services and industrial activities– those with higher productivity levels able to sustain high and increasing standards of living for their populations.

Some regional development researchers have claimed that a business-friendly institutional framework play a determinant role in explaining different development patterns among regions. In their view, successful regions are those that possess: (1) stable, predictable, and transparent

laws and regulations, (2) political stability, and (3) a favorable business climate (Gertler 2010, Hudson 2009, Pack 2004, Stimson *et al.* 2006).

Empirical studies highlighting the importance of an innovative milieu and local technological capacity have stressed the relevance of factors such as: (1) untraded interdependencies (2) management capacity, (3) organizational ability, (4) pro-market oriented technological and innovative capacity, (5) knowledge and technology absorptive capacity, and (6) some sort of "social capital" that creates rich patterns of supportive social relationships beyond the workplace and the boundaries of the company that facilitate informal exchange of both codified and tacit knowledge (Yglesias 2003, Rees 2001).

The role of entrepreneurial capacity in the process of regional development and how entrepreneurial capacity might be cultivated at the regional level is a research area of growing interest. Many regional development researchers argue that entrepreneurship plays a crucial role in regional development, and substantial empirical research has been conducted in recent years seeking to find evidence of such a role and the mechanism through which it operates. However, to date researchers have been unable to set forth a theory of regional development that clearly explains the role of entrepreneurship in regional development (Rees 2001, Malecki 1997 chap. 5, Nijkamp and Abreu 2009).

Concluding Remarks

The mainstream theories of regional economic development differ in (1) the assumptions they make with respect to the balance between agglomerating and dispersing forces and (2) the forces other than agglomerating/dispersing forces influencing regional economic development they emphasize.

With respect to the balance between agglomerating and dispersing forces it is possible to group the theories reviewed in this paper into three major groups. One group of theories assume that agglomerating forces will ensure that dynamic places over a certain threshold will continue to growth and that this positive dynamic does not necessarily spill over into surrounding and less dynamic areas. Among such theories are: the theory of cumulative causation, export-base theory, input-output theory, and endogenous growth theories. Other theories consider that, at least in the

long-term, the spread effects over surrounding areas tend to be stronger than the agglomerating effects. Such is the case of growth center theory and central place theory. A third group includes, among others, the firm location theories and the new economic geography theories which consider that the balance between agglomerating and dispersing forces is unclear depending on the strength of the several distinct forces in place.

Different theories of regional development emphasize distinct factors other than agglomerating/dispersing forces influencing regional economic development. For instance, the traditional neoclassical theories emphasize the roles of local endowment (and relative prices) of the factors of production (capital, labor, and land) and total factors productivity – viewed as a function of technological progress which, in turn, is exogenous to the local development process. The recent neoclassical endogenous growth-inspired models emphasize knowledge and technological spillovers, two of the sources of technological progress (and thereby productivity growth) identified by such theories. Other theories emphasize local competitive advantages based on local characteristics as important factors influencing regional development besides the agglomerating/dispersing forces. Among these theories are: export-base theory, theory of cumulative causation, new economic geography theories, functional development theory, and product life-cycle theory. Others emphasize the local industrial mix and the local inter-industry linkages as relevant as well (input-output theory). Both the Schumpeterian dynamic disequilibrium theory and the region life-cycle theory add the notion that technological developments and time might create incentives for businesses, employment, and people to locate in lagging and less dense places where investment in new industries and new infrastructures may be more efficient compared to tearing down and rebuilding the obsolete productive structure and/or basic infrastructure of some dense regions.

More recent empirical research suggests that several factors playing a crucial role in regional development among regions already in higher stages of economic development have been ignored by the mainstream theories of regional development. Among them are: institutional framework, local entrepreneurial capacity, and local innovative milieu and technological competitiveness.

The fact that these important intangible factors of regional development have been largely ignored by mainstream theories of regional development suggests that such theories have some limitations in explaining

the regional development process of developed and sophisticated regions in knowledge-intensive and innovation-driven economies. However, this does not necessarily mean that such theories are rendered useless. Many of them, namely the firm location theory, the core-periphery theories, export-base theory, input-output theory, and new economic geography theories, still offer a valuable framework of analysis in the face of the rising importance of such factors. The drawback of these frameworks is that they lack the consideration of variables that properly account for such factors. Since these factors are highly intangible in nature, the challenge is, therefore, to find appropriate methods and indicators to assess them.

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