



Regional Development Theories and Formalised Economic Approaches: An Evolving Relationship

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Abstract

This paper revisits, in a diachronic perspective, the evolution of the relationship between regional development theories, on the one hand, and formalised economic models on the other. The initial intuition is that in order to interpret the complexity of the real world there is a need for a stronger integration and cross-fertilization between the qualitative/conceptual approaches and formalised/analytical ones. The relationship between the two approaches has evolved over time, achieving however only a partial convergence. In fact, still required is a step forward which would produce an approach combining the economic laws and mechanisms which explain growth, on the one hand, with the territorial features that spring from the intrinsic relationality present at local level on the other. The paper ends by presenting the result of a research programme developed over 15 years by the author and her research group: a regional macroeconomic growth model, called MASST (macroeconomic, sectoral, social and territorial), able to merge the richness of the conceptual, qualitative, approaches interpreting the complexity of economic phenomena taking place at territorial (local) level with the rigour and the precision of the formalised, analytical, models. The interpretative power of such a tool, presented in the last part of the paper, testifies to the appropriateness of the initial intuition.

Keywords Formalised economic approaches · Regional development theories · Evolution in their relationship

1 Introduction

Despite the official status of an independent economic discipline achieved with the publication of the book “Space and the Economy” by Walter Isard in 1956 (Isard 1956), the relationships between regional economists and mainstream economists have always been complex. The main source of conflict has been the reluctance

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among mainstream economists to recognise as solid economic theories the qualitative/conceptual approaches developed by regional economists. Still today, mainstream economists do not seem to grasp the advantages and richness of interpretations provided by some qualitative approaches to local development. In their turn, regional economists seem to put excessive emphasis on local economic dynamics, in general denying all sorts of aggregate, macroeconomic causes of regional economic trends.

This paper has the aim to revisit, in a diachronic perspective, the way in which the relationship between regional development theories, on the one hand, and formalised economic approaches on the other, has evolved over time, highlighting the causes that induced the change in the interaction between the two streams of thought, and the conceptual steps forward that have been achieved by the evolution of that relationship. Different “phases” in the relationship can be identified; since the beginning of the 1950s in which an overlap existed between regional development theories and formalised models, to the 1970s and 1980s representing a period of drastic divergence, followed in the 1990s by a partial convergence, until the recent attempts at partial integration (2010s). Each phase enlarges and enriches the interpretative power of local economic growth; however, as we shall see, each step towards a more formalised approach to regional development has been made at the expense of the interpretation of space as a source of growth on its own, as a production factor and an independent resource.

My personal conviction is that if one’s intention is to interpret the complexity of local dynamics, it is necessary to adopt an approach combining the economic laws and mechanisms which explain growth, on the one hand, with the territorial features that spring from the intrinsic relationality present at local level on the other. In the past 15 years, my research programme—and that of my research group—has been devoted to the creation of a regional growth model, labelled MASST (Macroeconomic, Sectoral, Social, Territorial), able to merge the richness of the conceptual, qualitative, approaches interpreting the complexity of economic phenomena taking place at territorial (local) level with the rigour and the precision of the formalised, analytical, models. The interpretative power of such a model, presented in the last part of the paper, confirms the appropriateness of the intuition.

The paper starts by providing a definition of regional economics, which is often interpreted in trivial terms by mainstream economists (Sect. 2). The study proceeds by suggesting a (personal) interpretation of the evolution in the relationship between regional development theories and formalised economic models, seeking to determine the causes of change in the relationships and highlighting conceptual steps forward (and sometimes backward) in the development of economic thought accompanying the evolution of that relationship (Sects. 3 and 4). In the last part (Sect. 5), the paper presents the regional growth model developed by the author and her research group¹ with the purpose of integrating the richness of the qualitative approaches into

¹ For the MASST (Macroeconomic, Sectoral, Social, Territorial) model, see (Capello 2007a; Capello et al. 2008, 2017; Capello and Fratessi 2012).

formalised macroeconomic models, and it presents examples of the strong interpretative power of such an integrated model. Section 6 concludes.

2 What is Regional Economics About?

Regional economics is often given a trivial definition. It is usually associated with a discipline conceptualising economic phenomena at sub-national, administrative, regional unit level. Or it is often identified as the discipline studying economic processes empirically with data at administrative levels. Or, finally, it is interpreted as a discipline primarily dealing with phenomena of spatial clustering of economic activities, like industrial districts; this is especially the case of the Italian context, where the industrial district theory was initially formulated (Becattini 1979, 1989).

Regional economics is much more than what is superficially believed, and when the right definition is provided, its richness clearly emerges. Regional economics is the branch of economics which incorporates the dimension 'space' into analysis of the workings of the market. "It does so by including space in logical schemes, laws and models which regulate and interpret the formation of prices, demand, productive capacity, levels of output and development, growth rates, and the distribution of income in conditions of unequal regional endowments of resources. Furthermore, regional economics moves from 'space' to 'territory' as the main focus of analysis when local growth models include space as an economic resource and as an independent production factor, a generator of static and dynamic advantages for the firms situated within it—or, in other words, an element of fundamental importance in determining the competitiveness of a local production system" (Capello 2007b, p. 2).

It may seem somewhat banal to emphasise the importance of space for economic activities. Firms choose their location, as they choose their input factors, since the location may even become an economic resource and, as an independent production factor, a generator of static and dynamic advantages for the firms situated within it—becoming a strategic element in determining the competitiveness of a local production system. And yet, economists have always devoted their attention to the quantities of resources to be used for various purposes; only in the recent past have they concerned themselves with where those resources and activities are located or where they will be located. In economics the temporal dimension has always superseded the spatial one.

Regional economics can be split in two main branches:

- location theory, the oldest branch of regional economics, first developed in the early 1900s, which deals with the economic mechanisms that distribute activities in space;
- regional growth (and development) theory, which focuses on spatial aspects of economic growth and the territorial distribution of income.

Location theory gives regional economics its scientific-disciplinary identity and constitutes its theoretical-methodological core. It has typically microeconomic foundations and it adopts a traditionally static approach. It deals with the location choices of firms and households. Linked with it are a variety of metaphors, cross-fertilizations, and theoretical inputs (from macroeconomics, inter-regional trade theory, development theory, mathematical ecology, systems theory) which have refined the tools of regional economics and extended its range of inquiry. Location theory uses the concepts of externalities and agglomeration economies to shed light on such macro-territorial phenomena as disparities in the spatial distribution of activities, thereby laying the territorial bases for dynamic approaches.

Regional growth theory is instead intrinsically macroeconomic. However, it differs from the purely macroeconomic approaches of political economy in its concern with territorial features. In particular, regional development theories represent the point of maximum cross-fertilization between the two traditional branches of regional economics: regional growth on the one hand, and location theory on the other. Just as we speak of the micro-foundations of macroeconomics, so we may speak of the locational foundations of regional growth theory. However, as we shall see later, the merging of location theories in regional development models has always been possible through theories that were qualitative in nature.

By analysing the evolution of regional growth and development theories, in the remainder of this paper the evolution of the relationships with formalised economic models is highlighted. Four phases are identified, according to the different linkages between mainstream economics and regional economics that emerged over time. As we shall see, starting from an “overlapping phase, and moving through phases of ‘divergence’ and ‘partial convergence’, a ‘partial integration phase’ has now been reached, enriching the interpretative power of the models.

3 The ‘Overlapping Phase’: the 1950s and 1960s

In the 1950s and 1960s, ‘growth’ referred either to a Keynesian view of short-term increase in employment and income level, or to a long term neoclassical view of increase in individual well-being. The export base theory of North (1955) adopted a short-term view of growth and concentrated on the exploitation of given and unused capital resources and of large labour reserves. These growth theories assumed the presence of idle production capacity (capital stock) and large labour reserves. In these conditions, local economic growth did not depend on the structure and dynamic of supply (which by definition is able to expand and respond rapidly to market requirements); rather, it was driven by growing demand for locally produced goods which exerts an income multiplier effect through increases in consumption and employment.

The classical (and neoclassical) economic approaches, instead, conceptualised the growth process in terms of productive efficiency, of the division of labour in a Smithian sense, and of production factor productivity, and hence examined the dynamics of wages, incomes, and individual well-being. Regional growth dealt with

individual well-being, which was to be addressed in two ways: by acting upon factor productivity, thereby obtaining increases in real per capita wages and incomes (Borts and Stein 1964), and by fostering processes of production specialization which yielded advantages deriving from the purchase of goods on interregional markets at prices lower than they would be if the goods were produced internally to the region (Ohlin 1933). These theories also comprised the notion of relative growth—of divergence/convergence in levels and rates of growth among regions—in that they measured the magnitude and trend of disparities among per capita incomes. Growth was interpreted in this way by most of the theories developed in the 1960s. Problems of poverty, underdevelopment, and inequalities in the spatial distribution of income were the normative aspects of concern to these models.

In both approaches, regions were interpreted as ‘small countries’ in the terminology of international trade but, unlike nations, they were characterized by marked external openness to the movement of production factors.² Geographic space was therefore divided into ‘regions’, areas of limited physical-geographical size (largely matching administrative units) considered to be internally uniform and therefore synthesisable into vectors of aggregate social-economic and demographic features.

It is not by chance that regions were given a similar definition. The advantage of this conception of space was that it enabled the use of macroeconomic models to interpret local growth trajectories, marking an overlapping phase between regional growth models and formalised economic approaches. But although these models were characterised by a rigorously formalised economic logic, they nevertheless called for the exclusion of any mechanism of interregional agglomeration, to discarded location theory, and ignored the advantages of local proximity. They assumed unequal endowments of resources and production factors, unequal demand conditions, and interregional disparities in productive structures as the determinants of local development. Inevitably simplified to “homogenous regions”, space was conceived as a physical container of growth, performing a purely passive role in economic growth paths, while some macroeconomic theories reduced regional growth to the simple regional allocation of aggregate national growth. The elegant analytical structure of regional growth models was therefore obtained by renouncing a role of space in the development process.

4 The ‘Divergence Phase’: The 1970s and 1980s

In the mid-1950s, the first doubts about the interpretation of the region as an administrative unit, a “homogeneous region”, were expressed by the French economist François Perroux, who claimed in his “growth pole” theory that development manifested itself as “a selective, cumulative process which does not appear everywhere at the same time but becomes manifest at certain points in space with variable intensity” (Perroux 1955, p. 308).

² The definition provided by Ohlin of a ‘region’ is that of a territory characterized by perfect mobility of production factors. See Ohlin (1933).

However, it was not until the 1970s that these ideas were put forward and a drastic change in the interpretation of space took place. Space was no longer conceptualised as an administrative region and the idea that agglomeration forces were behind development trajectories of local areas was strongly asserted by regional growth theories. The conceptual 'leap' of theories like the industrial districts theory (Becattini 1979; 1989) and local *milieu* theory (Aydalot 1986; Aydalot and Keeble 1988; Camagni 1991) consisted in interpreting space as 'territory', or in economic terms, as a system of localized technological externalities. In fact, thanks to proximity and reduced transaction costs, a set of tangible and intangible factors were expected to act upon the productivity and innovativeness of firms (Camagni 1980). Moreover, the territory was conceived as a system of local governance which united a community, a set of private actors, and a set of local institutions. Finally, the territory was interpreted as a system of economic and social relations constituting the relational or social capital of a particular geographical space (Camagni 2002).

Territory became a source of increasing returns, of positive externalities taking the form of agglomeration and localization economies. Higher growth rates were achieved by local production systems thanks to increasing returns that acted upon local productive efficiency to reduce production and transaction costs, enhance the efficiency of the production factors, and increase innovative capacity. Regional development consequently depended upon the efficiency of a concentrated territorial organization of production, and not only on the availability of economic resources or their more efficient spatial allocation.

This new conception of space brought with it several new aspects. Space became a *diversified* space in which it is easy to distinguish, even internally to a region, the uneven distribution of activities. As suggested by Perroux (1955), development came about selectively in areas where the concentrated organization of production exerted its positive effects on static and dynamic efficiency. During the 1970s and 1980s neo-Marshallian schools of thought explained firms' productivity through territorial externalities: industrial districts (Becattini 1979), development from below (Stöhr 1990), indigenous potential (Ciciotti and Wettmann 1981), local context (Johannisson and Spilling 1983), system areas (Garofoli 1981), localised industrial systems (Courlet and Pecqueur 1992). All of them adopted the idea that development depends 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.

These notions were relaunched with a dynamic perspective by neo-Schumpeterian schools of thought. The milieu innovateur theory (Aydalot 1985; Camagni 1991), the learning regions theory (Lundvall 1992), the regional innovation systems approach (Asheim 1996), the concept of related variety (Boschma 2005) expanded and consolidated the idea that local growth is the result of externalities

acting upon dynamic efficiency of firms. For these approaches, innovation was fuelled by processes of collective learning, of exchange of knowledge stemming from physical, cognitive, institutional, social proximities. Space assumed a new aspect, a *relational* one, in that economic and social relations were analysed as performing crucial functions in various respects. They ensured the smoother operation of market mechanisms, more efficient and less costly production processes, the accumulation of knowledge in the local market, and a more rapid pace of innovation—all of which are factors that foster local development. For the first time in the history of economic thought, soft elements, of a social nature, were cited as drivers of growth; trust, cooperation, synergies, sense of belonging, identity were all elements characterising a socio-economic environment and distinguishing it from others. These socio-economic conditions were interpreted as sources of externalities for local firms, explaining the development trajectories of local areas.

Territory, and not simple space, assumed an active role in the interpretation of the evolution of an area. Any interpretation of abstract or administrative space was obviously abandoned, and instead a new interpretation of space emerged which—by focusing on the economic and social relations among actors in a territorial area—was able to tackle more complex phenomena which arose in local economic systems.

Precisely because the theories of the 1970s and 1980s viewed development as depending decisively on territorial externalities in the form of location and spatial proximity economies, they stressed (for the first time in the history of economic thought) the role of endogenous conditions and factors in local development. These theories adopted a micro-territorial and micro-behavioural approach; they can be called *theories of development* because their purpose was not to explain the aggregate growth rate of income and employment—as in the case of the above-mentioned uniform-abstract space theories—but instead to identify all the tangible and intangible elements of the growth process.

In these development theories, location theory was inextricably linked with local development theory. By pointing out that concentration generated locational advantages, which in their turn created development and attracted new firms whose presence further boosted the advantages of agglomeration, these theories elegantly revealed the genuinely 'spatial' nature of the development mechanism.

Local development theories thus form the core of regional economics, the heart of a discipline where maximum cross-fertilization between location theory and development theory permits analysis of regional development as *generative* development: the national growth rate is the sum of the growth rates achieved by individual regions—as opposed to the *competitive* development envisaged by the theories of the 1950s and 1960s, where regional development was nothing but the simple regional allocation of aggregate national development.

The objective of these theories was to explain the competitiveness of territorial systems, the local determinants of development, and the capacity of an area to achieve and maintain a role in the international division of labour. They thus tried to identify the local conditions that enabled an economic system to achieve and maintain high rates of development. They did so by neglecting the formalised nature

of the previous regional growth theories, and by maintaining that no role was performed by the macroeconomic environment in which a region lies.

Inevitably, in this phase a *radical divergence* arose between formalised growth models and regional *development* models. In Italy, this methodological conflict was very profound and stemmed from the provocative and idiosyncratic attitude of one of the main Italian economists at that time, Giacomo Becattini, towards abstract and formalised approaches.

5 The 'Partial Convergence Phase': The 1990s and 2000s

Until the end of the 1980s the conflict between formalised and qualitative approaches to economic growth developed without the slightest convergence between them, and already in the mid-1970s, regional economics was recognised to be in front of the impasse: "either a 'pure and exact' regional theory without agglomeration economies, or an 'applied regional theory', which is inexact but takes agglomeration factors into account" (Von Böventer 1975, p. 3).

At the beginning of the 1980s, the necessity of a formalised, quantitative approach to the interpretation of regional and urban phenomena induced regional economists to focus their attention on the rise of advanced mathematical tools for analysis of the qualitative behaviour of dynamic non-linear systems (bifurcation, catastrophe, and chaos theory) (Prigogine 1979). Ecological-biological models, self-organising and catastrophe theories were for the first time applied to the interpretation of urban life cycles and urban and regional growth: the Volterra-Lotka prey-predator model was applied to urban life cycles (Dendrinos and Mullally 1985; Nijkamp and Reggiani 1992, 1993; Camagni 1992), chaos and catastrophe theories (May 1976; Papageorgiou 1980; Wilson 1981) were used to interpret urban and regional growth (Miyao 1987), spatial auto-organisation models were at the basis of urban dynamics (Allen 1982; Camagni et al. 1986). Regional economists were the first to discover the usefulness of such mathematical tools: only some years later did economists (Medio 1992; Puu 1993) and environmental economists (Cazzavillan and Musu 1998; Weitzmann 2009) discover such interpretative tools and applied them to their respective fields of inquiry.

The development of advanced mathematical tools opened the way also to formalized economic models able to abandon the assumptions of constant returns and perfect competition. Thanks to Dixit and Stiglitz's formalized model of imperfect competition, agglomeration economies—stylized in the form of increasing returns—were inserted into elegant models of a strictly economic nature (Dixit and Stiglitz 1977).

It was in this period that the 'new economic geography' (Krugman 1991a, b) and the 'endogenous growth' theories (Romer 1986; Lucas 1988), were conceptualised. The important innovative characteristics of such formalized theories was that they enabled elegant growth models of a strictly economic nature to include agglomeration economies, in the form of increasing returns, as determinants of local development. Moreover, they were able to demonstrate that it was possible to conceptualise

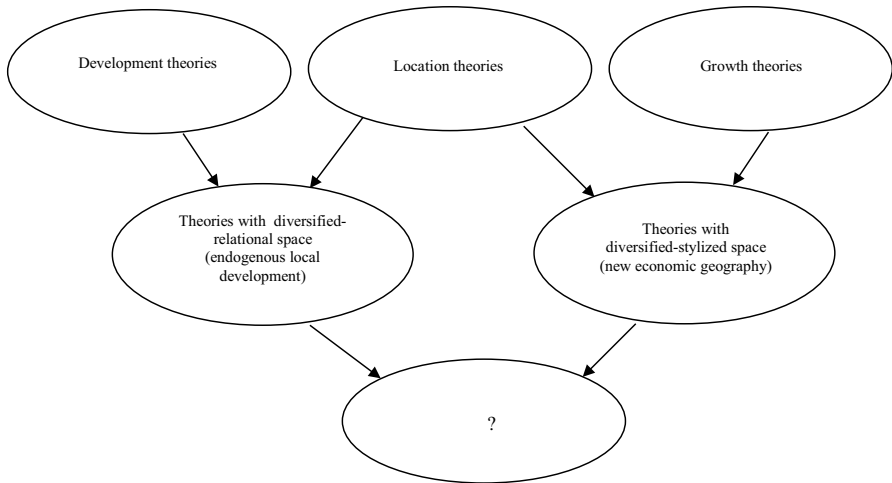


Fig. 1 Convergence among theoretical approaches. Source: Capello 2004

agglomeration economies as a source of regional growth using the traditional tools of economic theory (optimizing choices for firms and individuals) (Capello 2016).

The result of such effort was that orthodox economists were induced to (re-)discover the spatial dimension of economic phenomena. Thanks to the new theories, a ‘*partial convergence phase*’ started. These theories, in fact, conceived growth as generated by the advantages of the spatial concentration of activities, and by the agglomeration economies. They counterposed dynamic growth trajectories with increasing returns and transportation costs, thus reprising the economic-locational processes analysed by location theory.

These achievements were obtained, however, at the expenses of a return to a simpler conception of space than the one of territory. As I argued sometimes ago, “The new economic geography and the endogenous growth theories envisaged in fact the existence of polarities in space where development insisted, diversifying the level and rate of income growth even among areas of the same region. However, although diversified, space was stylized into points with no socio-economic dimension. Localized technological externalities did not exist in this space; nor did a set of tangible and intangible assets which act upon firms’ productivity and innovative capacity because of physical, cognitive, relational proximity and limited transaction costs; nor a system of economic and social relations constituting the relational or social capital of a certain geographical space” (Capello 2007b, p. 9). These approaches thus reprised the simple, and trivial, view of space as the simple container of development; the economic mechanisms in the ‘new economic geography models’ were the same whatever type of space and location (cities, regions, districts...) they were called upon to interpret. Space inevitably lost its interesting and intriguing role as a source of growth on its own, as a production factor and an independent resource.

6 The 'Partial Integration Phase': The 2010s

In 2004, I concluded my regional economics textbook with the idea that important integration phases had taken place over time (Capello, 2004). Regional development theories were the result of a merging of ideas put forward by the theories of development and of location. New economic geography theory found its roots in growth and location theories (Fig. 1). Nevertheless, I was claiming that: “still required is the further step forward which would produce an approach combining the economic laws and mechanisms which explain growth, on the one hand, with the territorial features that spring from the intrinsic relationality present at local level on the other. Such an approach would represent the maximum of cross-fertilization among location theory, development theory, and growth macroeconomics; a synthesis which would bring out the territorial micro-foundations of macroeconomic growth models (Fig. 1). An undertaking of this kind, though, would require analysis of variables besides the cost of transport, which annuls the territory’s role in the development process. Also necessary would be variables that give the territory prime place—even in purely economic models—among local growth mechanisms. This is the challenge that awaits regional economists in the years to come” (Capello 2007b, p. 9).

Since that time, together with my research group on regional economics at the Politecnico di Milano, I have developed a research programme with the aim of building a regional macroeconomic growth model able to integrate the qualitative aspects of regional development theories, capturing the territorial complexity, within a formalised economic growth model. The MASST (MAcroeconomic, Sectorial, Social and Territorial) model (Capello 2007a; Capello et al. 2008, 2017; Capello and Fratesi 2012) was produced, moving towards a partial integration of qualitative elements into a formalised model in two directions:

- by developing quantitative measures of all soft elements constituting *territorial capital*, defined as the set of tangible and intangible, public and private resources that form the growth potential of a region (Camagni 2009);
- by *integrating territorial complexity* into formalised economic growth models, through the concept of territorial capital, and its laws of accumulation and depreciation that differ in space, and represent the complexity of a territory.

As regards the first direction, already at the end of the 1990s several studies tried to make quantitative measurement of soft elements, like trust, social capital, sense of belonging, relationality, district economies, and prove their effects on firms’ productivity and innovativeness, using statistical tools and cross-section econometric analyses. For the time they were developed, these studies had the indubitable merit of removing the anecdotal content typical of the industrial district theory from empirical analysis and of furnishing quantitative measures of phenomena difficult to gauge (Pietrobelli 1998; Rabellotti 1997; Signorini 2000; Capello 1999; Capello et al. 2008; Rodríguez-Pose 2013). More recently, also mainstream economists have followed the same path, focusing especially on intangible aspects like trust and

social capital (Tabellini 2005; Guiso et al. 2008), arriving to state that “one quarter of GDP is persuasion” (McCloskey and Klammer 1995).

More complex and new is the integration of territorial complexity into a formalised economic growth model. The research group of Politecnico of Milano bases the model on a logical and consistent theoretical framework able to link together all crucial macroeconomic aspects and the endogenous territorial ones. The internal logic of the model, in fact, is an elegant merger of two different approaches:

(a) The theory of endogenous development, explaining competitiveness as the regional driver (supply), made dependent on:

- single elements of territorial capital: differentiated urban structures of regions, differentiated patterns of innovation;
- territorial complexity: differentiated territorial patterns of innovation; urban growth potential (urban equilibrium size); urban structural dynamics.

(b) Macroeconomic Keynesian growth theory as regards national growth. Macroeconomic conditions as a national/global demand framework.

Structured in this way, the model overcomes the distinction between macroeconomic growth, without differentiated regional effects and regional growth, with no macroeconomic effects. The model consists of a series of equations, represented in the flow chart that summarises the cause/effect chain and all feedbacks conceived in the model (Fig. 2).

The model explains national growth through demand elements, each of which finds its determinants in the Keynesian theory. Thanks to this sub-model, the macroeconomic trends and policies influence regional growth, making the evolution of a region linked to that of its nation. Devaluation, increase in the spread, decrease of public expenditure, just to cite some of the recent important macroeconomic trends strongly impact in fact on the economic trajectories of each nation and its regions. Added to this aggregate, macroeconomic element is a second one, which interprets the regional growth differential through supply elements that generate differentiated effects at the regional level; through these elements, the above-mentioned policies and macroeconomic processes impact in different ways on the single regions. The sum of the national growth rate and of the differential growth rate gives rise to the regional growth rate.

The territorial structures present in MASST represent both the propulsive forces of regional growth and the factors that explain local responses to exogenous aggregate trends. The model in fact includes tangible and intangible elements of territorial capital that, on their own or through their integration, explain local growth (element A in Fig. 2). The model includes the advantages stemming from an industrial specialisation—the source of localization economies, or district economies; and industrial specialization, in its turn, defines the industrial employment growth patterns (element C in Fig. 2). The model also considers the advantages that stem from the integration among regions, i.e. from the possibility of taking advantage from proximity to tangible and intangible factors present in a neighbouring region in the form of technological externalities or growth spillovers (element D in Fig. 2).

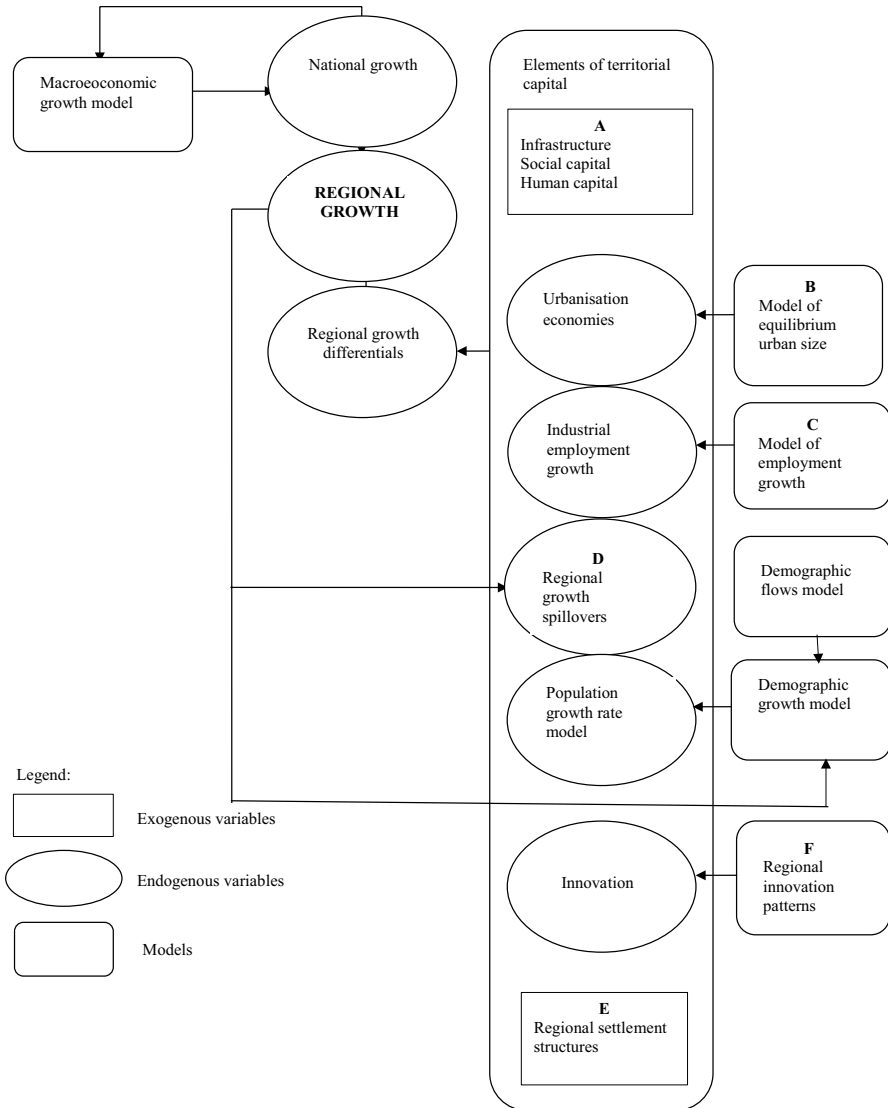


Fig. 2 The intrinsic logic of the MASST model: interaction between macroeconomic and regional elements. Source: Capello 2016

Territorial complexity is taken into consideration through: i) the way in which a region’s trajectory depends on its urban structure, and on how its cities grow, and ii) how regions innovate. For what concerns the first one, the model attributes a distinctive role to advantages stemming from an urban environment; advantages which, in their turn, depend on the specificities of single cities, and of the urban system as a whole (element B of Fig. 2) (Camagni et al. 2016). For what concerns the innovative aspect, the model conceives the fact that regions have differentiated innovative

modes (patterns) that determine their innovative trajectories (element F in Fig. 2) (Capello and Lenzi 2013).

As said, exogenous macroeconomic trends, at both European and national level, have differentiated regional effects captured through specificities in the settlement structure of a region (urban, rural or agglomerated region), influencing industrial dynamics, regional differential growth, migration flows, and indirectly population growth (element E in Fig. 2).

Through this logical structure and its theoretical bases, the model is able to overcome the distinction between a regional growth exclusively dependent on endogenous elements, and a regional growth dependent on the pure top-down distribution of an aggregate national growth rate. Given this intrinsic structure, the MASST model is distributive and generative at the same time thanks to horizontal feedbacks (among regions, in the form of growth spillovers) and vertical ones (between nations and their regions, and vice versa). A macroeconomic effect propagates in different manner among the regions according to the different structural characteristics of the local economy, and it retro-acts both on the other regions and on the nation in an aggregate manner. Likewise, changes at the local level (generated for example by regional policies) influence the regional growth trend, and through it the national growth and the growth of all other regions belonging to the same nation, in a cumulative circular process.

But, more importantly, the MASST model opens to what can be labelled “a partial integration phase”. It is in fact a model that conceptualises the merging between the rigour and precision of formalized macroeconomic growth models with the richness and depth of thought of the qualitative approaches.

The initial intuition about the necessary and possible convergence between formalized/analytic and qualitative/conceptual approaches to regional science (or between regional development and regional growth studies) proved viable and fruitful (Camagni and Capello 2018). In fact, when the MASST model was applied to produce quali-quantitative scenarios, it proved to be a powerful interpretative tool of the complex economic reality. In 2012, when the MASST model was applied to build a scenario in which the emerging structural changes brought about by the crisis were assumed to remain for a period of 15 years, the model anticipated what then became a reality: the interruption of the convergence trends among European regions, in a period in which macroeconomic forces were imposing superior (but regionally differentiated) constraints on all regions (national fiscal crises, austerity measures, exchange rate devaluations and ‘internal’ devaluations). Moreover, when two scenarios driven respectively by mega-cities and by medium and medium-large cities were built, the latter scenario proved at the same time the most expanding and the most cohesive, anticipating the idea that cohesion is not by definition in contrast with competitiveness (Camagni et al. 2015).

7 Conclusions

The history of thought in regional economic growth modelling has shown a succession of phases in which formalized models have been at the basis of the explanation of regional growth trajectories, and phases in which qualitative elements and the complexity of territorial phenomena have overcome the rigour of economic formal models. The difference between the two approaches strongly lies in the way space is conceived, in the role space assumes in explaining growth trajectories. Traditionally, qualitative approaches are able to express the richness and the complexity of territorial phenomena, and are able to give space an active role in the explanation of regional growth trajectories. Formal approaches are rigorous in interpreting economic cause-effect chains and are therefore based on solid economic reasoning. This rigour, however, is achieved by reducing space to a geographical container of economic phenomena.

The long-term belief of the author has always been that the convergence between formalized/analytic and qualitative/conceptual approaches to regional science (or between regional development and regional growth studies) is the way to provide a rich understanding of the complexity of the reality. The last 15 years of research have been devoted by the author and her research group to the creation of a regional growth forecasting model, called MASST. The model embraces macroeconomic elements and territorial aspects, the latter through both quantitative measures of soft elements constituting the territorial capital and the integration of territorial complexity into formalized economic growth models. The results of the scenarios built through MASST have proved that the initial intuition was viable and fruitful, given the strong interpretative power demonstrated by the model.

Much more can still be done: for example, determination of the *territorial* micro-foundations of macroeconomic growth models, which is still an open research avenue for those scientists who strongly believe in methodological individualism. Also in this case, the integration of the qualitative elements influencing location choices will represent a step forward in the capacity to interpret the complexity and diversity of the evolutionary trajectories of our territories.

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