
Regional Competitiveness, Territory and the City: The Research Programme of an Impressive Mind

1

Roberta Capello

1.1 Introduction

Sixty years since the publication of the seminal work “Location and the Space Economy” by Walter Isard (Isard 1956), regional and urban economics has achieved full recognition as a stand-alone economic discipline able to incorporate the dimension ‘space’ into analysis of the workings of the market 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 (Capello 2007a). Urban economics today embraces rich and complex theories and tools able to produce general powerful representations and conceptual pictures of the city and of urban systems, of their formation and evolution (Camagni 1992a). The knowledge accumulated in these 60 years is ample, rich, and stimulating, and it is able to open a scientific mind to the interpretation of spatial phenomena.

The discipline owes its evolution to impressive minds which have sometimes courageously contested general beliefs by introducing innovative counter-intuitive definitions, concepts, theories, methods, and interpretations to move the knowledge frontier further forward. One of these minds is certainly that of Roberto Camagni, who spent all of his working life in search of new approaches, theories and methods to explain the “unexplainable”, to measure the “unmeasurable”, to know the “unknown”. He never denied the importance of what colleagues and friends had discovered, but he was never satisfied with what was already present in the literature. Always using others’ new publications as the basis on which to provide his own contribution, and always with an eye to normative debates, Roberto provided an impressive number of new theories, concepts, and methods. He thus enriched the

R. Capello (✉)
Politecnico di Milano, Milano, Italy
e-mail: roberta.capello@polimi.it

discipline with theoretical tools to interpret the role of space in different economic phenomena ranging from regional competitiveness to the interpretation of the city and of urban systems, their formation and their evolution. He furnished useful suggestions on what he considered to be the most efficient design and implementation of regional policies and spatial planning. Roberto's retirement in November 2017 gave me an excuse to revisit his contribution to Regional and Urban Economics. From his efforts, only partially presented in this book, there emerges an impressive life-long research programme, the product of an outstanding scientific mind.¹

This book contains examples of Roberto's creativity. It gives an interested reader the opportunity to discover other ideas or to explore those presented here more deeply by reading the large number original publications that he produced in his career.²

The aim of this introductory chapter is to guide the reader through Roberto's seminal ideas, linking one to another so as to provide the general framework of his extended research programme. I had the great fortune to work with this inspiring mind for more than thirty years, and to build my own research programme on its products. At some stages of Roberto's professional life, I had the chance to help his ample research programme to grow, become richer, and form a particular "school of thought", now known as the "school of Regional and Urban Economics of the Politecnico di Milano". I am sure that Roberto's retirement is only a formal step in his life, which cannot limit a vivid mind like his. His presence will continue, and it will guide our research group for many years to come.

1.2 Specificities and Phases of a Rich and Comprehensive Research Programme

Roberto Camagni's research programme covers a vast number of issues and themes in regional and urban economics. They range from the definition, formation and determinants of regional competitiveness to the economic justifications of the existence of the city (and urban systems) and the economic laws of their growth. Despite the extent of the studies treated, Roberto's contributions are marked by specific features which characterise his research programme:

- his constant effort to reject the trivial concept of space and to embrace that of territory, with the constant endeavour to highlight the active role of space in economic phenomena. No longer a simple geographical container, space was conceived in Roberto's research programme as an economic resource in itself, as a reducer of uncertainty and risks, of dynamic increasing returns and externalities reinforcing innovation processes at local level. With this idea,

¹Annex 1 to this book reports the impressive curriculum vitae of Roberto Camagni.

²Annex 2 to this book contains a long list of Roberto Camagni's publications, organized by his main themes of research which will be presented in details in this introduction.

Roberto enriched the best tradition of Italian seminal works on industrial districts (Becattini 1975, 1990) with the interpretation of space as the generator of dynamic advantages for firms, and as a key determinant of a local production system's competitiveness and growth;

- his belief in a multidisciplinary approach to interpreting urban phenomena. Roberto has always been fascinated by the explanatory power of pioneering models of urban growth *à la* Tiebout and Czamanski of the 1960s and 1970s, of spatial interaction models, and of more recent self-organisation and multi-agent approaches. Roberto particularly appreciated these models for their capacity to produce general powerful representations and conceptual pictures of the city that a pure economic approach was unable to provide;
- his merging of mainstream, mainly neoclassical, economic approaches with more heterodox, evolutionary but also classical economic ones. In Roberto's approach, the city (like the territory) is frequently considered to be a sort of collective economic concept, or even a collective agent, extending beyond the traditional methodological individualism of mainstream economics which considers individual agents alone: "if individual firms and individual people undertake collective activities, facilitated by (and creators of) trust and local social capital; and if significant cognitive synergies, readily apparent in the local *milieu*, result from their various interactions; and, finally, if these actions and these processes draw additional vitality from cooperation with local administrations; then it appears justifiable to go beyond methodological individualism—which regards only single firms and individuals as operating and competing—and to argue for the logical validity of a 'collective' concept such as that of *territory* (and city), and to affirm that territories (and cities) compete among themselves, using the creation of collective strategies as their instrument" (Camagni 2002, pp. 2406; Chap. 5);
- his scientific deductive research method, which imposed as the starting point of the analysis clear definitions of the concepts treated. This way of proceeding was at the basis of his constant attention to clear, linear and measurable interpretations of concepts, which were often confused and fuzzy in the literature. Concepts like regional competitiveness, territorial cohesion, urban sustainability, territorial capital, to mention only some of them, found in Roberto's definitions an interpretation which became a source of inspiration for many scholars, and a way out of confused and mainly inconclusive debates around them;
- his attention to overcoming the limitations of well-known theories by identifying (mis-)interpretation of concepts, by (re-)formulating them, obtaining a clearer idea of what was meant, by adding often a dynamic perspective, requiring himself to achieve new "paradigms" in the interpretation of well-known or even new phenomena, accepting the risk of being criticised and rejected by traditional schools of thought;
- his tendency to apply a dynamic perspective to interpret the reality, with the strong belief that the interpretation of the evolution of territorial processes is the basis for sound regional policies and spatial planning;

- his search for sound and methodologically rooted empirical analyses that could prove the validity of his new and innovative theoretical concepts, theories and models.

Roberto's long research programme emerged smoothly. It went through natural phases of a mental evolution: from an early stage, in which Roberto already showed an outstanding capacity to produce new ideas, followed by a period of exponential growth of ideas, theories, concepts and definitions in different fields of regional and urban economics, until full maturity where he merged his knowledge with his arts of leadership and diplomacy in guiding his research group in the strong international competition in scientific research, with a high degree of success. All these phases were characterized by an impressive and admirable scientific creativity (Table 1.1).

The early phase took place between the mid-1970s and 1980s, when Roberto's interests were mostly focused on Regional Economics; it is, however, in this period that his passion for urban issues started to emerge. Seminal ideas—like the definition and measurement of regional competitiveness, the role of territory in local knowledge creation (the milieu innovateur theory) (Camagni 1991a; Chap. 4), the “efficient, rather than optimal, urban size” contained in the Soudy model (Camagni et al., 1986; Chap. 9), the formation of urban rent (and income distribution) between the city and the countryside (Aydalot and Camagni 1986) (Table 1.1)—were developed in those early years. The influence of the French school of Philippe Aydalot, of the GREMI (Groupe de Recherche sur les Milieux Innovateurs) group, the cooperation with Italian colleagues (Riccardo Cappellin for the regional competitiveness analyses, and Lidia Diappi and Giorgio Leonardi, two eminent system analysts, for urban studies), were crucial in that early period.

The 1990s and 2000s were Roberto's most active period, in which he produced an unbelievable and admirable number of seminal works in all fields of Regional and Urban Economics (Table 1.1). In 1992, he published his Urban Economics textbook (later translated into French and Spanish, but unfortunately, to my great regret, never into English!), the first (and to date only) textbook in that discipline published by an Italian (Camagni 1992a). In regional economics, it was in this rich and active phase of his life that Roberto published a constructive criticism of Paul Krugman's provocative statement that regions and cities compete on the basis of relative comparative advantage *à la* Ricardo, with the rather dangerous consequence that regional policies have no reason to exist (Chap. 5). It was also in those years that Roberto provided evidence of the importance of national (macro-economic) effects on regional development. He demonstrated a clever scientific balance between macro-economists, who neglected all sorts of regional effects of national policies, and regional economists, at that time concentrated on reinforcement of the “endogenous regional growth model” launched in the 1970s by the industrial districts theory, and who therefore obsessively denied any kind of role of national economic phenomena in regional growth (Camagni and Capello 1990). It was in that period that Roberto became interested in urban planning. Under the influence of his wife, Maria Cristina Gibelli, Roberto's interest centred on what was

Table 1.1 Roberto Camagni's seminal concepts, theories and methods: a diacronic perspective

	Phases		
Research areas	The early phase (mid-1970s–1980s)	The exponential phase (1990s–mid-2000s)	The maturity phase (mid-2000s–onward)
<i>Regional economics</i>			
Definition and measurement of local competitiveness	Measurement of productivity gains	Regional competitiveness: definition and measurement	Macro-econometric regional growth forecasting model (MASST model)
Sources of local competitiveness	Intra and inter-sectoral productivity gains	Regional impacts of national effects Absolute vs. relative comparative advantages	Territorial capital as a new concept
Sources of endogenous innovation	Context conditions in spatial diffusion processes of innovation Milieu innovateur theory		Regional innovation patterns
<i>Urban Economics</i>			
Urban economic theory		Five principles governing a city	
Optimal city size and agglomeration economies	The Soudy model	Beyond optimal city size theory	Dynamic agglomeration economies
Urban crisis and urban success	Income distribution between city and non-city	Income distribution between two types of remuneration (through a prey-predator model) The city as a milieu	
Urban rent		Absolute vs. differential urban rent	
Urban systems		City networks theory	
Urban sustainability and urban form		Urban sustainability: definition and measurement	
<i>Regional policies and spatial planning</i>			
Regional policies		Regional development policies through the milieu innovateur concept The regional impact of macroeconomic policies	The overcoming of the traditional efficiency vs. equity trade-off Smart innovation policies
Spatial planning		Strategic planning Spatial planning: modern principles and goals	Territorial cohesion: definition and measurement Territorial impact assessment (TEQUILA model)

then a new approach to urban planning, known as “strategic planning”, and soon became an advisor to most of the Italian municipalities interested in launching a strategic plan for their city (Gibelli 1996; Camagni 1996a). It was in that period that Roberto entered the field of “urban sustainability”. He provided a measurable definition of this concept, and launched a large research programme, leading a multidisciplinary group of economists and planners. The result was a rich interpretation of urban sustainability from both the economic and territorial perspectives (Camagni 1996b, 1998; Chap. 13).

From the mid-2000s onwards, Roberto reached full maturity, guiding his research group in many innovative research projects won through tough competition at international level. One of the most interesting projects—which became a research programme for more than 10 years—was the implementation of a macro-econometric regional growth forecasting model whose acronym contained the various dimensions—Macroeconomic, Sectoral, Social and Territorial (MASST)—on which it was based (Capello 2007b; Capello et al. 2008, Capello and Fratesi 2012; Capello et al. 2011a, b, 2014; Camagni and Capello 2012; Chap. 7). The MASST model is now very well known at the international level, and it is considered a useful and powerful tool with which to build scenarios for European regions under different assumptions of future European, national, and regional economic trends. A second extraordinary achievement in his maturity was to guide his research group to the interpretation of regional innovation patterns, which proved to be a conceptual framework extremely useful for achieving a balanced approach with respect to the two extreme general beliefs on which innovation policies were developed: the former inclined to interpret R&D as the only tool with which to increase regional innovativeness; the latter calling for the opposite situation of leaving each region to identify its own innovation (smart) specialization (Camagni and Capello 2013; Chap. 16). It was in this phase that Roberto took up the challenge issued by the European Union to define “territorial cohesion”. He did so by developing a clear and measurable definition of this fuzzy concept, and he launched a simple and effective method to assess the impact of programmes and projects on territorial cohesion (Camagni 2006; Chap. 20) which was applied in many studies and cited by several authors. It was also in those years that Roberto developed the concept of “territorial capital”. This notion synthesised all potential assets for regional growth, by underlining the economic nature of each of them, and especially each single law of accumulation and depreciation, on which to base appropriate regional policies (Camagni 2009a; Chap. 6).

The richness of Roberto’s ideas and the *fil rouge* linking them emerge from the more in-depth analyses of his works presented in the following sections.

1.3 On Regional Economics

1.3.1 On the Definition and Measurement of Regional Competitiveness

In the mid-1980s regional competitiveness was interpreted as the result of a sectoral composition. It was a source of productivity gains because it affected the regional aggregate pace of technical progress. In his studies together with Riccardo Cappellin on sectoral productivity and regional growth for the European Union, Roberto explained for the first time that sectoral productivity is only part of the story; region-specific, intersectoral factors were interpreted as determinants of the mobility of resources, horizontally affecting all sectors located in an area. Local tangible and intangible resources (the latter comprising trust, sense of belonging, cooperation) were analysed as sources of local firms' productivity despite their sectoral belonging (Camagni and Cappellin 1981, 1985). In this way, for the first time, the definition of regional competitiveness was based on productivity gains achieved through inter-sectoral factors and through a process of sectoral reallocation.

In the 1990s, regional competitiveness was seen as an elusive concept given the two different definitions provided of it: (i) an increase in the export-base of the region, focusing on export performance (Storper 1997; European Commission 1999; Rowthorn 1975); (ii) an increase in factor productivity (Krugman 1998; Porter and Ketels 2003). The two approaches seemed even contradictory. The former required an increase in the ratio between the general level of import prices and the level of export prices expressed in a common currency; competitiveness, in fact, increased when the denominator was reduced (due to a devaluation or a reduction in export prices) and tended to generate growth in exports (in volume) and employment. The latter was based on the opposite relationship (export prices on import prices), i.e. the terms-of-trade, since the basic idea that increasing the efficiency of the export sector meant being able to import the same amount of goods employing a lower quantity of local resources (this is mainly the case of process innovation), or to import more with equal utilization of local resources. In this case a reduction of export prices, and therefore an increase in competitiveness, resulted in a reduction of welfare.

Within this debate, Roberto offered a way out of this apparent unsolvable antithesis by claiming that: "the conflicting situation can be resolved by turning to a different measure of competitiveness: if it is true that 'it is better to sell with prices rising rather than falling' and that the problem consists in dealing with the expected fall in demand in a situation of rising prices, the answer, both conceptual and operative, is of increasing the attractiveness of local products by taking action on innovation, thereby breaking the static context, both conceptual and operative, of price competition. We thus come up in favour of a concept of non-price competitiveness" (Camagni 2002, p. 2399; Chap. 5).

In the field of statistical methods for the measurement of productivity gains, Roberto provided innovative approaches. In his 1985 study for the European

Commission with Riccardo Cappellin, he proposed a decomposition of the Theil index of disparities in productivity so as to capture different effects behind productivity disparities. With a simple decomposition of labour productivity levels at current prices in purchasing power parity into the multiplicative form of three indicators—labour productivity at constant prices, the relative evolution of internal prices relative to foreign prices, and the purchasing power parities index—the various effects explaining the evolution of productivity index could be disaggregated into: (i) effects due to technological factors, (ii) those determined by the market power of the various economies, such as the evolution of prices expressed in common currency, and (iii) the effects due to the relative evolution of internal prices relative to foreign prices, such as the evolution of the purchasing power parity index (Camagni and Cappellin 1985).

But this was not all that Roberto produced in the field of regional competitiveness measurement. Starting from the idea that productivity increases can take place within different structural processes, which affect the general performance of regional economies in rather different ways, Roberto suggested a statistical methodology with which to determine whether productivity gains are the outcome of growth of new and efficient firms, or rather of reconversion processes, the restructuring of existing production through process innovation, and abandonment of non-efficient productions (Camagni 1991b). To depict the various situations, Roberto suggested a method able to analyse three indicators at the same time on a chart: relative industrial employment growth, relative industrial productivity growth, and relative industrial GDP growth. In fact, when the first two indicators were plotted on two axes, a 45° negatively sloped line passing through the origin reflected a condition of GDP growth rate equal to the national average. A region might develop at the same rate as the national GDP either if both productivity and employment grew at the same rate as the national average, or if productivity increased at a lower rate but employment at a higher than average rate, and vice versa. Plotting these three indicators on the same chart identified six possible different structural situations, six *patterns of regional growth* (Camagni 1991b):

1. *virtuous cycle*, when higher-than-average productivity growth generates good performance in both employment and output;
2. *restructuring*, when a higher-than-average productivity growth is achieved through severe employment cuts, leading nevertheless to good output performance;
3. *dropping-out*, when productivity growth is achieved by closing down inefficient production units generating lower-than-average production growth;
4. *de-industrialization*, defined as a vicious cycle in which employment cuts are unable to restore competitiveness, a condition that perpetuates job losses and low output growth;
5. *industrial conservatism*, when poor productivity growth is accompanied (and sometimes explained) by a better-than-average employment growth, generally due to public assistance and industrial rescues;

6. *sheltered development*, when explicit or implicit assistance policies spur the initial development of the area, notwithstanding low productivity performance.

This methodology therefore made it possible to distinguish among very different situations hidden behind productivity gains: new and efficient firms, reconversion processes restructuring production through process innovation, dropping out of inefficient productions.

1.3.2 On the Sources of Regional Competitiveness

Given Roberto's interest in the definition and measurement of regional competitiveness, he could not avoid being attracted by the interpretation of the sources of productivity gains.

In this field, a first seminal contribution by Roberto was the idea that, in order to explain regional (local) competitiveness, emphasis must be placed on both endogenous elements (entrepreneurial capability) and external (macroeconomic and macro-territorial) conditions (Cappellin 1983; Camagni and Capello 1990, 2010). In the second part of the 1980s, when endogenous regional development theories were at their peak, especially in Italy, with their bottom-up perspective on regional growth (Becattini 1975; Dei Ottati 2003), Roberto entered the debate by signalling the limitations (refused and denied by its theoreticians) of such an approach. Roberto provided an interpretation that made it possible to overcome what he thought was a circular reasoning of the endogenous approach ("there is industrial development because there is entrepreneurship") and to reply to the question "why now and not before was development occurring in some areas?". He did so by refusing to put a pronounced and unique emphasis on endogenous aspects. He highlighted instead the importance of the contextual, inter-regional, and objective elements that accompany a development path.

According to Roberto, macroeconomic conditions exert an undeniable influence on the birth, development, and crisis of local areas. To prove this assertion, Roberto built a theoretical model in which both spatial interdependence and feedbacks taking place over time were summarised in the concept of a region's 'relative locational advantage'. This was measured by means of two indicators—productivity defined in the broad sense as the overall efficiency of the local social-productive system, and the cost of labour, also defined in the broad sense as the cost of 'labour force reproduction'—which were used to determine all the socio-environmental factors that affect the real purchasing power of wages in each region. Applied to the Italian case, relative locational advantages of the three Italian macro-regions very clearly evidenced the favourable conditions enjoyed by the North-East-Central (NEC) regions during the 1970s, and the contemporaneous loss of competitiveness by the North-West. These results were due to the manufacturing and exporting difficulties of the large industrial areas in Italy that led to general medium-period exchange rate weakness, and to a decrease in the cost of labour (expressed in international currency). The latter worked mainly to the advantage of the North-East and

Central (NEC) regions because of their specialization in labour-intensive ‘tradable’ manufactures with greater elasticity to price. Comparison between productivity and cost of labour evidenced the economic revival of the ‘central’ regions in the 1980s and—more interestingly—the crisis of relative competitiveness that hit some regions, especially those of central Italy: a crisis which was neither foreseen nor explained by industrial district theory (Camagni and Capello 1990).

In the 1990s the economist Paul Krugman launched the provocative argument in favour of the general validity of the Ricardian comparative advantage principle of countries also for regions and cities; Krugman’s conclusion was that regional policies had no reason to exist since they played no role in local competitiveness (Krugman 1998). In front of this statement, Roberto could not resist reacting with a sound, solid and scientifically rooted critique of this statement.

In regard to the economic mechanisms behind regional competitiveness, Roberto stated that an appropriate reply to Krugman’s position had not been found because different territorial levels of analysis had been mixed up, as if the same economic “laws” could apply equally to cities, regions and nations. Starting from these premises, Roberto highlighted that regions differ from countries in that they compete on the basis of an absolute advantage in the presence of exogenous shocks. The adjustment processes which restore equilibrium in international trade, at the basis of the principle of comparative advantages, in fact, do not work in the same way at national and regional level: at regional level, wages and prices are not sufficiently flexible, and exchange rate movements are not applicable by definition. Roberto’s starting-point was the idea that, although Ricardo’s model yielded the result that trade was always in the interest of a country, it actually occurred only if there were absolute advantages in commerce between economic actors which compared the (absolute) prices of a good in the two countries, given a certain exchange rate. In the higher-productivity country, wages were necessarily higher than in the less efficient country, where factor remunerations were defined on the basis of lower levels of productivity and overall output. It was logically likely that productivity gaps would be on average perfectly off-set by wage gaps (calculated in the same currency)—which demonstrated that comparative advantages are also absolute advantages (Camagni 2002; Chap. 5).

Roberto has recently taken up the challenge of identifying sources of productivity gains once again by offering a new and fruitful concept able to summarise all different potential sources of total productivity differentials among regions, and consequently of regional growth differentials: the concept of territorial capital defined as all the local, tangible and intangible, endogenous and exogenous, assets, of public and private nature, that constitute the development potential of an area (Camagni 2008, 2009a, b, c; Chap. 6). Also in this case, Roberto was stimulated by a challenge. This one was raised by the OECD and by DG Regio of the Commission of the European Union, which launched in some of their official documents the concept of ‘territorial capital’, providing a very fuzzy definition of what it meant: “Each region has a specific ‘territorial capital’ that is distinct from that of other areas and generates a higher return for specific kinds of investments than for others, since these are better suited to the area and use its assets and potential more

effectively. Territorial development policies (policies with a territorial approach to development) should first and foremost help areas to develop their territorial capital” (European Commission 2005, p. 1). Roberto took up the challenge by providing a measurable definition of territorial capital through a taxonomy built upon two main dimensions (materiality and rivalry), which enabled direct consideration to be made of a wide variety of territorial assets, both tangible and intangible, and of a private, public or mixed nature, and chosen so as to identify the economic nature of each component of territorial capital and, consequently, the laws of accumulation and depreciation of each component. These assets can in fact be physically produced (public and private goods), supplied by history (cultural and natural resources, both implying maintenance and control costs), intentionally produced despite their non-material nature (coordination or governance networks) or unintentionally produced by social interaction undertaken for goals wider than direct production. The proposed taxonomy allowed identification to be made of the specific economic nature of each component, and the consequent accumulation and depreciation processes that accompany the life cycle of each asset. This was an aspect fundamental for defining the appropriate strategies for the use of these resources, ensuring their protection and their valorization in the long run (Camagni 2009a, b, c; Chap. 5). Supported by empirical analyses, Roberto and his research group (Perucca 2013, 2014; Capello et al. 2011a, b) demonstrated that it is not the endowment of single assets that make the difference for regional growth differentials, but the interaction of specific elements that generate their higher efficiency. Econometric analyses showed that the mere existence of knowledge did not explain regional growth trajectories; on the contrary, knowledge played an important role in those European regions characterized by the high endowments of social and relational capital that were fundamental for the exploitation of local knowledge (Capello et al. 2011a, b).

The synthesis of territorial capital allowed Roberto to highlight different conceptual approaches that characterise the rise of regional competitiveness. Without denying the importance of the traditional functional approach—also termed a “positivist and cognitive approach”—which interpreted the reality on the basis of deterministic, mechanical, cause-effect relationships, Roberto embraced a more modern approach which suggested inter-subjective relationships more complex than the deterministic ones. This approach was based on the ways in which economic actors interpret the reality, react to external stimuli, and are capable of synergic and cooperative behaviours. Roberto underlined and actively participated in defining local competitiveness as linked more to trust and a sense of belonging than to a simple endowment of capital; more to creativity than to the pure presence of skilled labour; more to relational capital than to accessibility; more to local identity than to the presence of important elements like quality of life and efficiency of the economic system (Camagni 2009a; Chap. 18).

Roberto launched the territorial capital concept in the conviction that such a rich concept would be of great normative value, especially in a period when regional policies were expected to be conceptualised on the basis of differentiated strategies specific to the local context. As the “Barca Report” of the European Union

suggested, regional policy had to be a place-based policy built on the basis of the specificities and elements of competitiveness of each single area through participatory and inclusive processes (Barca 2009). A conception of territorial capital embracing and systematizing all the elements on which competitiveness could rely—and highlighting the laws of accumulation and depreciation—was therefore crucial for the appropriate design of these policies.

Roberto's scientific interest in the sources of regional competitiveness culminated in the implementation of an innovative and new macroeconomic regional growth forecasting model (called MASST), which was built by his group on all the ideas that Roberto had previously developed on the sources of regional competitiveness: (1) the crucial role of macroeconomic elements and conditions in interpreting regional growth; (2) the importance of local conditions, understood as territorial localised externalities, behind both the propulsive forces of regional growth and local responses to exogenous aggregate trends; (3) the importance of the right mix of asset endowments, and of their interactions, for competitive growth.

The internal logic of the model allowed all crucial macroeconomic aspects and endogenous territorial assets to find a role. The structure of the model was, in fact, an elegant merger of two different approaches: macroeconomic Keynesian growth theory as regards national growth, and the theory of endogenous development as regards the regional growth differential. With this structure, the model allowed endogenous differentiated regional feedbacks of national policies and trends to take place, as well as to be distributed differently among regions, according to each region's capacity to capture national growth potentialities, following a distributive logic. In their turn, regional shocks, and regional feedbacks, propagated regional GDP growth on the basis of structural elements explaining regional capacity to react to shocks. Regional shocks propagated to the national level through the sum of the regional GDP levels, giving the model a generative nature (Capello 2007b; Capello et al. 2008; Capello and Fratesi 2008; Capello et al. 2011a, b, 2014; Camagni and Capello 2012; Chap. 7).

The MASST model now competes with other well-known regional growth models like GMR (Varga 2015), REMI (Treyz 1993) and RHOMOLO (Brandsma et al. 2015). However, it remains unique for its capacity to merge macroeconomic factors with territorial, local, endogenous ones (Capello 2009).

Roberto applied the MASST model to develop scenarios. Once again, his originality brought his research group to identify a particular methodology in scenario building, now known as “quantitative foresight”. The intention of Roberto's methodology was not to provide precise estimates of future GDP levels (forecasts), but rather to highlight the main tendencies, major adjustments to change, relative behavioural paths that will be at work, given some conditional assumptions about the influence of the main driving forces (conditional foresights). Moreover, the intention was not to identify desirable, positive, ideological or most probable scenarios. Instead, the goal was to combine in a strictly logical way the different trajectories, or different bifurcations, that can be envisaged in the main economic, institutional and social driving forces of change and consequently to

build a small number of alternative, likely, and ‘conditional’ scenarios. The methodology was as neutral as possible *vis-à-vis* the results, letting the forecasting MASST model produce the outcome associated with a particular set of assumptions about the future. With this scenario-building methodology, the research group produced representations on what the future of the European territory would look like under alternative assumptions concerning: (i) after-crisis territorial development paths (Camagni and Capello 2011, 2012; Camagni et al. 2015); (ii) structural industrial changes in Eastern and Western countries (Capello et al. 2015); (iii) European policy strategies (place-based vs. social cohesion policies; Capello and Caragliu 2016).

1.3.3 On the Role of Territory in Innovation Processes

Roberto’s studies on sources of regional competitiveness have always given particular emphasis to innovation processes. Since his first studies on the spatial diffusion of innovation (Camagni 1985; Chap. 3), Roberto has always been attracted by interpretation of the role of territory in innovation diffusion processes and knowledge creation (Camagni 1991a; Chap. 4). Roberto had a clear idea of what he meant by territory: “(i) a system of localised externalities, both pecuniary (where advantages are appropriated through market transactions) and technological (when advantages are exploited by simple proximity to the source); (ii) a system of localised production activities, traditions, skills and know-hows; (iii) a system of localised proximity relationships which constitute a ‘capital’—of a social psychological and political nature—in that they enhance the static and dynamic productivity of local factors; (iv) a system of cultural elements and values which attribute sense and meaning to local practices and structures and define local identities; they acquire an economic value whenever they can be transformed into marketable products—goods, services and assets—or they boost the internal capacity to exploit local potentials; (v) a system of rules, practices and institutions defining a local governance model” (Camagni 2002, pp. 2396; Chap. 5).

With this definition of territory in mind, Roberto developed his theories on the role of space in innovation processes and knowledge creation. Attracted by the pioneering work of Torsten Hägerstrand (Hägerstrand 1966), in the mid-1980s Roberto became interested in the spatial diffusion of innovation, and worked on the idea of an S-shaped pattern as the correct representation of an innovation diffusion process over time. Roberto was particularly interested in the main criticism of Hägerstrand’s model: that it can explain adoption processes only through a simple epidemic process, where the pure likelihood of contact between people who have already adopted an innovation and its potential adopters is used as an explanation of innovation diffusion. This approach contained the implicit assumption that every potential adopter has the same opportunity to adopt, and that spatial variations in adoption are due solely to information flows that spread territorially at different times. Following the pioneering studies of Griliches (1957) and Mansfield (1961), Roberto found a way to conceptualise and empirically prove the role of

local features in explaining the adoption time, as well as the speed and saturation level, of innovation diffusion processes (Camagni 1985; Chap. 3). In particular, Roberto suggested that three preconditions are necessary for faster technological diffusion to come about: availability of information in the territorial context, depending closely on its receptiveness and endowment with advanced human capital; relative profitability with respect to existing technologies; and low adjustment cost from the old to the new technologies. For a new technology to be adopted, it is not sufficient that it demonstrates economic superiority with respect to existing technologies; it is also necessary that the present values of differential earnings are expected to be higher than the costs which have to be met to bring the internal structure of the firm into line. And this last element is also linked to the characteristics of the regional environment (Camagni and Cappellin 1985). This was the period when I met Roberto, and my first degree dissertation was a study on the economic interpretation *à la* Griliches of the spatial diffusion of telecommunications services in the Italian regions (Capello 1988).

Roberto applied the concept of territory also to identify local conditions for the generation of new knowledge. The theoretical interpretation of space as territory had been present since the early inquiries on the backwardness of the Italian *Mezzogiorno* in terms of institutional, political and socio-cultural factors (Nitti 1903; Gramsci 1934). It later opened the way to the huge theoretical advancements of the endogenous development literature—industrial districts, production clusters—through the Italian regional scholars' attention given to intangible, atmosphere-type, local synergy and governance factors (Bagnasco 1977; Becattini 1975; Brusco 1982). Within this stream of thought, Roberto re-interpreted the role of space as the generator of dynamic external economies—that is, all those advantages which favour not only the productive efficiency of firms but also their innovative efficiency. In this perspective, space reduces the uncertainty associated with every innovative process (Camagni 1991a; Chap. 4). Relational capital, defined as a set of proximity relations which brings together and integrates a local production system, a system of actors and representations and an industrial culture, and which generates a localised dynamic process of collective learning, is at the basis of evolutionary processes of local areas, defined as *milieux innovateurs*.

While in the literature of the mid-1970s geographic proximity had already been associated with socio-cultural proximity—the presence of shared patterns of behaviour, mutual trust, common language and representations, common moral and cognitive codes—to explain static advantages for firms, thanks to Roberto and the GREMI group that he co-chaired for more than 15 years, non-spatial proximity became the conceptual tool to interpret dynamic efficiency and endogenous innovation processes (Camagni 1991a; Chap. 3; Camagni and Capello 2002; Camagni and Maillat 2006), opening the way to many studies that later elaborated on the concept of a-spatial proximity to innovation processes (Boschma 2005; Torre and Rallet 2005). On critically examining the value added of the most recent theories in this field, it is striking how Roberto's milieu innovateur theory remains an unsurpassed approach, being the only one in which local elements are at the centre

of the sources of local innovative capabilities of local areas through processes of collective learning.

Roberto played an active role in the debate on intangible, social elements behind economic phenomena. It is always the case when new concepts are launched that they risk being over-emphasised; this is what happened in the 1980s to social elements interpreted as facilitators and supporters of economic interactions, to the point that the concept of social capitalism was suggested to interpret an economic system which avoided market competition thanks to the presence of social cohesion, trust, and sense of belonging (Nanetti 1988). Roberto clearly rejected this approach, stating that, despite the impression that might be given by industrial district theory's constant emphasis on cooperation, firms operating in a district engage in aggressive competition with each other, being obliged to do so by the ready substitutability of the goods which they produce.

Roberto's most recent ideas on innovation adoption and knowledge creation were stimulated by the request of the ESPON programme for a description of "the territorial dimension of the knowledge economy in Europe" on which to build sound innovation policies to re-launch the competitiveness of Europe as a whole. In this endeavour, together with his research group, Roberto developed the concept of regional innovation patterns. These were defined as different modes of performing the different phases of the innovation process, built on the presence/absence of the context conditions that support knowledge creation, knowledge attraction, and innovation. Roberto's idea was that the various components of the cognitivist, linear model of innovation—knowledge, invention, ideation, innovation, development—had to be broken down, separated, differently allocated in time and space, and finally recomposed following a relational logic of inter-regional cooperation and exchange. The way in which the various components were recomposed depended once again on the structural features of each regional context; the local conditions—interpreted both as material elements, in the form of functions for the creation of knowledge (R&D laboratories and universities), and non-material ones in the form of the relational capacity of local actors—became in this way integral part of the innovation mode of a region (Camagni and Capello 2013; Capello and Lenzi 2013; Chap. 16).

With the concept of regional innovation patterns, Roberto and his school broke with the traditional idea that the pure existence of knowledge creation functions is sufficient to guarantee the occurrence of an innovation process.³ Moreover, in Roberto's approach, innovation assumes a *relative* connotation—as a localised novelty in products, in technological or commercial processes, in organisation *with respect to the past*, not with respect to some best practice realised elsewhere—and, interestingly, it does not empirically exhibit a hierarchical sequence among the different patterns in terms of economic outcomes (productivity or GDP increases, innovation density). As we shall see later, this pioneering way to

³I refer here to the project entitled "KIT—Knowledge-Innovation-Territory" for the ESPON 2013 Programme, Luxembourg, 2010–2013.

conceptualise regional innovation was an important input for the design of modern smart innovation policies (Camagni and Capello 2013; Capello and Lenzi 2013; Chap. 16).

1.4 On Urban Economics

1.4.1 On the Five Principles in Urban Economics

During his scientific career, Roberto became fascinated by the phenomenon of the city, its complex nature, structure, evolution, the formation of urban systems and of their dynamics. His interest started after his first years of scientific studies, and it grew rapidly until the moment when he began the major *opus* of his life, the textbook on Urban Economics, published in Italian (1992a), French (Camagni 1996c) and Spanish (Camagni 2005a), and which took 5 years of his life (mostly during his winter and summer holidays) to complete. Thanks to the publication of his textbook, Roberto became the best-known urban economist in Italy, the only one in the country to hold a chair as full professor in urban economics, and his reputation as an urban economist also grew rapidly worldwide.

The uniqueness of Roberto's textbook lays in two main aspects. The first was the structure of the book, which organised the discipline around five main principles, replying to five main questions: the agglomeration principle, related to why a city exists; the accessibility principle, devoted to explanation of how economic and residential activities are organised within a city; the spatial interaction principle, aimed at interpreting the relationships among different parts of the city and among different activities within the city; the urban hierarchy principle, devoted to explanation of the economic laws behind the formation of urban systems; the competitiveness principle, which replies to the question: what are the economic sources of a city's growth? In this logical structure, the reader finds a link between theories and methods of different types (like pure economic models, both neoclassical and Keynesian in nature, spatial interaction models *à la* Wilson, geographic models *à la* Christaller and Lösch) that apparently do not have any shared feature and explanation to justify their existence in the same discipline. In Roberto's book, different theories and models were presented in systematic manner with a common aim: to explain the formation of urban rent. In fact, each of the first five chapters is devoted to provide the reader with the theoretical and interpretative tools to understand a subsequent fascinating chapter concentrated on urban rent (see Sect. 1.4.4 of this introduction).

The second characteristic of the textbook was that it did not only critically present all economic theories and models useful for understanding the city; it also contained new concepts and ideas that Roberto developed while writing the book. Some of them had never been published elsewhere, so that the textbook became a source of inspiration and novelty not only for students but also for scholars and experts of all levels. Being myself the author of a textbook (in my case on regional economics)—a decision I made certainly influenced by the knowledge, reputation

and self-confidence that Roberto acquired from writing his opus—I can confidently claim that Roberto’s textbook remains a magnificent scientific work with a unique value.

Roberto’s seminal ideas in urban economics were numerous (probably more than in regional economics). They are now briefly presented to guide the reader through the second part of the book.

1.4.2 On Optimal City Size and Agglomeration Economies

From the mid-1970s to the end of the 1980s, urban growth was conceived as dependent on urban size. In that period, a large number of econometric studies measured the importance of size as a source of agglomeration economies (see among others, Carlino 1980; Henderson 1974; Hoch 1972; Shefer 1973; Sweikauskas 1975) with no consideration of the fact that, despite their size, cities continue to grow, raising doubts as to the real existence of an “optimal city size” equal for all cities.

In the mid-1980s, together with two colleagues (Lidia Diappi and Giorgio Leonardi), Roberto entered the debate on the optimal city size by insisting on the importance of economic functions, each characterised by a specific demand threshold and a minimum production size. Starting from this consideration, Roberto and colleagues built a “supply side urban dynamic model”, called Soudy, and showed that there exists a minimum and a maximum city size beyond which urban location diseconomies outweigh the production benefits typical of that function (Camagni et al. 1986, 1994; Camagni and Diappi 1991; Diappi and Pompili 1990; Chap. 10). As each centre grows, approaching the maximum size compatible with its rank (‘constrained dynamics’), it enters an instability area where it becomes a potentially suitable location for higher-order functions thanks to the achievement of a critical demand size for them. In dynamic terms, each city’s long-term growth possibilities depend on its ability to move to higher urban ranks, developing or attracting new and higher-order functions (‘structural dynamics’). This ‘jump’ is not mechanically attained: it represents a true urban innovation, and it was treated as a stochastic process in the dynamic model. The city could stop growing if it did not innovate, and it could continue to grow if it innovated in the function that it hosted.

By reasoning in this way, the Soudy model overcame some of the limitations of the ‘optimal’ city size theory by suggesting:

- the need to replace ‘optimal’ size with an ‘interval’ within which the city’s size is ‘efficient’, i.e. where average production benefits exceed average location costs;
- the need to allow for different ‘efficient’ urban intervals according to the functions actually performed by cities;
- the possibility of separating urban ranks from urban size. Differently from Christaller’s approach, two cities of the same size can belong to two different ranks, depending on their capacity to attract/develop higher functions.

Solid econometric analyses by Roberto and his school demonstrated that when urban functions are taken into consideration, urban costs and benefits show a different shape with respect to the optimal city size theory; by increasing value added functions, the benefits of being located in a city (*ceteris paribus*) increase, as the SOUDY model suggested (Capello and Camagni 2000).

More recently, Roberto and his school have once again become theoretically interested in the explanation and empirical validation of the idea that agglomeration economies are not linked merely to the size of the city (Camagni et al. 2013). Criticising the neoclassical simplified approach that cities (like all places of agglomeration) enjoy pecuniary externalities generated by market interaction among firms which individually exploit internal economies of scale when a new firm enters the market (Krugman 1991), Roberto and his school once again highlighted the importance of the territorial characteristics of an area. In the absence of these conditional factors—like specific urban functions and the capacity of the city to cooperate with other cities—cities may experience a halt in their growth path and even a decline irrespective of their size class. These factors are not really quantitative in nature, but rather qualitative, and some quantum jumps in their endowment are needed at specific intervals if agglomeration economies are to fully generate their beneficial effects. The quality of activities hosted, the quality of production factors, the density of external linkages and cooperation networks, the quality of urban infrastructure—in internal and external mobility, in education, in public services—are all enabling factors allowing a long-term ‘structural dynamics’ process (in the language of dynamic modeling) through what could easily be called a process of urban innovation in each urban category (Camagni et al. 2013).

More recently, together with his school, Roberto has addressed another limitation of the neoclassical approach to agglomeration economies and city size, which claimed the superior efficiency level of larger vs. smaller cities (Krugman 1991 followed by all the new economic geography school); a claim largely contradicted in the real world by the fact that in certain periods of time smaller cities grow more than larger ones.

Roberto and his school suggested that the explanation for this apparent contradiction is the fact that what matters for interpreting urban growth is the crucial distinction between a static and a dynamic definition of urban advantage/productivity. In the former case, a comparison among cities across space, in the absence of a time dimension, highlights the superior efficiency *levels*; in the latter case, a comparison among cities in terms of time performance indicates the possible drivers of efficiency *increases* for each city size, especially in terms of the capacity to change some of the city’s internal characteristics which may act as structural constraints on its growth (Camagni et al. 2014, 2016; Chap. 12). Through an empirical econometric analysis on urban growth, Roberto and his group demonstrated for the first time that if urban productivity is linked to the size of cities (larger cities are more productive), this is not the case in dynamic terms: what explains urban dynamics is the increase of high-value functions more than the size of cities (Camagni et al. 2016; Chap. 12).

Again in regard to urban size, Roberto highlighted the limitations of the Von Thünen-Alonso-Fujita neoclassical approach to urban dynamics. In the neoclassical city, location benefits and costs are by definition equal. Roberto's intuition was that this is true in an intra-urban equilibrium logic, according to which, in the Alonso-Fujita model (Alonso 1964; Fujita 1985), the residential and production location equilibrium of, for example, a sub-urban location was achieved via a compensation mechanism between accessibility and urban rent. The result of the model was an indifferent location choice among all possible locations, i.e. lower accessibility to the centre was compensated for by lower rents and higher environmental quality. When the same reasoning was applied at an inter-urban equilibrium—the only possible result was that in an equilibrium solution, the same profits and utility levels had to be guaranteed by each city. In fact, if this were not the case, *ceteris paribus*, a city offering higher rents but lower agglomeration benefits (with the hypothesis of non-existent transport costs) would lose both residents and firms (Camagni 1992a). Urban size was in this case the result of market forces pushing towards the maximisation of utility levels for residents and profits for firms. On this reasoning, however, the use of the same production function for all cities inevitably generated cities of the same size (Camagni 1992a).

1.4.3 On Urban Crisis and Urban Success

With his passion for the city, Roberto could not resist entering the debate on the economic sources of urban crisis and urban success, an issue brought to the attention of scholars by famous economists. One of them was Baumol, whose model (1967) of the anatomy of urban crisis linked to stagnant productivity in services compared with the rise of salaries was well-known. However, this model was criticised because if activities of the stagnant sector influence the growth rate of labour productivity in the progressive sector, the aggregate growth rate of the city may be positive over time in conditions of balanced growth. Hence the “stagnant” sector, and the city, assume a propulsive role rather than the parasitic one emerging from the original model (Cusinato 2007).

Roberto found an original way out of this apparently endless debate by assuming, together with his French colleague and friend Philippe Aydalot, a partially different perspective: that of analysing income distribution between the city and the non-city, i.e. the countryside (Aydalot and Camagni 1986). Starting from the idea that the city cannot be interpreted as a closed system, as in Baumol's model, because it is inherently an element in the social (and spatial) division of labour, the reasoning of urban success and crisis enlarged. If urban services, considered as intermediate goods for industrial production, are able in their trade with the industrial countryside to transfer cost increases into prices, even in the presence of stagnation of total service production in the long run, the real value of these services in terms of agricultural and industrial goods increases. Thanks to a favourable trend in the terms-of-trade between the city and the countryside, the city may benefit from an increase in its income and purchasing power, avoiding its

crisis in spite of the stagnation of its real contribution to total GDP. This was what was meant in Marxian economics by the “contradiction between city and countryside” or in modern terms, by the inflationary nature of the city. Aydalot and Camagni tested three hypotheses: perfect specialization of the two territories and labour mobility (the city grows in size and appropriates the entire GDP in monetary terms); imperfect specialization and labour immobility (the city does not grow in size by definition and postpones its stagnation in time); and comparative advantage of the city in the production of services (the city may exploit this advantage by imposing prices and terms-of-trade even higher than in the previous competitive cases) (Camagni 2009a).

Roberto studied urban crisis and success also from a different perspective, that of the relationship between profits and rents. This was once again a perspective of income distribution, this time between two types of remuneration, a long-standing leitmotif in classical economic thought: land rent appropriates profits in the long term, determining a generalized trend towards a general crisis. In cities, a growth in profits (as a consequence of the launching of a new wave of innovations *à la* Schumpeter) is soon captured by an increase in urban land rent, giving rise to a consequent crisis (in profits, employment and urban income) until rents decrease again. Roberto theorized and modelled this mechanism in a prey/predator dynamic model in which profits were the prey and rents were the predator (Camagni 1992a). The model was successfully estimated in the case of Italian cities by his school (Capello 2002; Capello and Faggian 2002).

Again in his constant endeavour to explain growth dynamics, Roberto elegantly provided a convincing and rich interpretation of the city as a milieu oriented to continuous innovation: an operator which, by virtue not only of geographical but also of cognitive proximity, enhances dynamic efficiency and innovation through the (socialized) reduction of uncertainty and collective learning processes (Camagni 1991a; Camagni et al. 2004; Camagni and Capello 2005; Chap. 11). According to Roberto, even if the city is a much more complex system, pursuing major social goals which are not relevant to the milieu, it shares some characteristics with the latter: elements of proximity, strong internal integration, synergy, and psychological and cultural identity, that feed processes of collective and socialized production and the capacity to develop a common “vision” for the evolution of the local milieu (Camagni 1999). Moreover, the urban milieu is characterised by a network of informal or selected linkages developed around a specialisation sector or *filière* which grows within the urban context or the urban production system: “Empirical evidence suggests that many cases exist of such milieux or innovative milieux which characteristically exploit an urban atmosphere (and therefore an urban location), without implying that the entire city behaves like a milieu. The cases of the financial milieu in cities like Zurich, Geneva, Frankfurt; the innovative milieux developing around the fashion creation *filière* in Milan or Paris; the media or the communication milieux in Hamburg and Milan are important examples” (Camagni and Capello 2002, p. 257; Chap. 11). It is in terms of these intangible, relational aspects that urban competitiveness can be partially explained.

1.4.4 On Urban Rent

As said, the main purpose of the textbook on urban economics written by Roberto was to explain urban rent, even if in Italy this theme had always received little attention, with the exception of two seminal books by Erik Silva (1964) and Italo Magnani (1971), and of some radical reflections by leading urban planners interested more in the management of land rent than its interpretation (Campos-Venuti 1967). Roberto filled this gap in a chapter in his textbook devoted to urban land rent (Camagni 1992a, Chap. 9) and proposed a general theoretical synthesis in which two main subjects were given innovative treatment: the theorization of absolute land rent, and the profits/rent relationship, already mentioned above.

On absolute rent, Roberto started from Marx's intuition, which was not followed by a proper and acceptable theorization. It emerged from some inconsistencies in the standard von Thünen–Alonso model and some insufficient interpretations of the real world, namely (Camagni 2009a):

- why should a landlord on the edge of a city lend its property for a rent equal to zero? (this was mainly Marx's argument);
- what if total demand for urban land suddenly increases?;
- what if a city is able to provide perfect and costless transport modes in all directions so that each place becomes equally and perfectly accessible? Differential rent should go to zero but actual rent would rise because everybody would want to live and work in such a city!

Roberto took up the challenge of answering these questions by conceiving absolute rent as the effect of a generalized, macro-territorial “demand for city”, always compared with the scarcity of urban(-ized) land and its slow supply process and determined by the presence of generalized agglomeration advantages. The theoretical consequence was that it is not possible to build a complete theorization of urban rent by working on the accessibility principle alone (and differential advantage); the agglomeration principle providing an “absolute” advantage to all urban sites must be considered and added to the theoretical frame (Camagni 1992a, Chap. 9; Chap. 14).

1.4.5 On Urban Systems

At the beginning of the 1990s, a pioneering idea on “city networks” was launched by the Turin geographical school (Dematteis 1985, 1990; Emanuel and Dematteis 1990), which started to question the hierarchical, mainly vertical, relationships behind the Christaller approach to urban systems, and showed instead the existence of relationships different from the vertical, spatial ones among cities of different rank.

Descriptive rather than interpretative analyses of the phenomenon were provided by the geography school, which stimulated in Roberto's mind the intent to provide a

solid economic explanation for the existence of those horizontal, a-spatial relationships among cities even of the same size that occurred in reality, and which could not find any rational explanation in Christaller's theory.

Inspired by industrial economics in which the concept of network behaviour was studied, Roberto efficiently transferred this concept to urban economics. He interpreted city networks as systems of relationships and flows of a mainly horizontal and non-hierarchical nature among complementary or similar centres; their economic rationale consisted in the provision of externalities or economies of respectively a specialisation/complementarity/spatial division of labour and synergy/cooperation/innovation. In the former case one could speak of "complementarity networks"; in the latter, of "synergy networks" (Camagni 1994; Chap. 10). In practical terms, the networking process came about through transport and logistics integration, cooperation in multiple fields, the single location of high-order functions or facilities without their being replicated on the small scale of the single city, organisational and informational integration (as for example in tourist cities organized into integrated itineraries). The twofold advantage provided by the network was that it enabled achievement of a larger market and critical mass—whereby some excellence functions become profitable—while maintaining the limited, and certainly more sustainable, size of the single centres (Camagni 1994; Chap. 10).

The city network concept recalled that of "borrowed size" propounded by Alonso (1973) to explain a disconnection between the size and function of smaller cities part of a megalopolitan urban complex: '*[t]he concept of a system of cities has many facets, but one of particular interest . . . is the concept of borrowed size, whereby a small city or metropolitan area exhibits some of the characteristics of a larger one if it is near other population concentrations*' (Alonso 1973, p. 200). However, the city network concept added to that of "borrowed size" the idea that size can be borrowed not only thanks to physical proximity to larger centres but also thanks to relationships and flows of a mainly horizontal and non-hierarchical nature among complementary or similar centres, located far from each other, intended to achieve network externalities (Camagni 1994; Capello 2000; Camagni and Capello 2004; Chap. 10).

Statistical-econometric analyses conducted by Roberto and his school corroborated the city network paradigm. The first type of empirical analysis allowed city networks to become visible when inter-city interaction (e.g. telephone calls) was far greater than that expected on the basis of an entropy spatial interaction model. This method made it possible to identify city networks in northern Italy in two main cases: in district areas characterized by close interaction and cooperation, and in the metro area of Milan, with an initial polycentric organization (Camagni et al. 1994). The second type of analysis was able to quantitatively measure the existence of network externalities in city networks. An international network of cities, namely the Healthy Cities network, was analyzed with econometric and clustering methodologies in order to identify forms of network externalities or network surplus. Different behavioural styles were found: opportunistic behaviour (only political legitimacy for local policy makers), exploratory

behaviour (with little learning or advantage), efficiency aiming behaviour (through information gathering and cooperation), and strategic behaviour (seeking shared innovative solutions) and a clear network surplus was identified (Capello 2000; Camagni and Capello 2004).

1.4.6 On Urban Sustainability and Urban Form

At the end of the 1990s, a wide-ranging debate began on how cities should grow in terms of physical structure in order to protect the environment. Urban sustainability and urban form became fashionable themes (see, among others, Breheny 1992; Haughton and Hunter 1994), on which planners and urban economists provided interesting ideas, even if the debate was soon taken over by ideological, rather than scientific, reasoning.

Roberto entered the debate by claiming that urban sustainability was “hindered until recently by some unresolved problems—of definition, methodology and epistemology—intrinsic in the more general concept, and also by some specificities of the urban case which have not been sufficiently borne in mind” (Camagni 1998, p. 6; Chap. 13).

Roberto assumed leadership of an extended research programme on urban sustainability developed by economists and planners at the Politecnico of Milano with the aim of defining the fuzzy concept of urban sustainability and specifying its various aspects. Roberto suggested that, given the artificial nature of the city and its historical role of facilitating human interaction, a definition arising from natural contexts was unsuitable, while one based on the co-evolution and positive interaction among the economic, social and physical subsystems seemed more appropriate and fruitful, particularly with reference to the complex environment/growth nexus (Camagni 1998). Sustainable urban development was therefore interpreted by Roberto as a process of synergetic integration and co-evolution among the great subsystems making up a city (economic, social, physical and environmental) which guaranteed the local population a non-decreasing level of well-being in the long term, without compromising the possibilities of development of surrounding areas and thereby contributing to reducing the harmful effects of development in the bio-sphere (Camagni 1998; Camagni et al. 1998; Capello 1998; Chap. 13). Efforts were made to measure urban form by Roberto and his research group, in both theoretical and empirical terms. Roberto’s work in 2002 (Camagni et al. 2002) was probably the first econometric analysis in Europe to link urban form with urban sustainability, showing the impact of sprawl and low density settlements on land consumption and mobility by private means and the advantage of compact, diversified and mixed urban tissues.

Testifying to the originality of Roberto’s analyses of urban sustainability is the prize that he received from the Fondazione Confalonieri of Milan, in 2008, for “innovative, creative and original studies in the field of urban sustainable development”.

1.5 On Regional Policies and Spatial Planning

1.5.1 On Justification, Design and Implementation of Regional Policies

The policy side of scientific research has always been the main scope and interest of Roberto's research activity. His passion for the normative side of his research found practical application when he was appointed Head of the Department of Urban Affairs at the Presidency of the Council of Ministers in Rome, under the Prodi Government, in 1997–1998. Moreover, Roberto found time and energy throughout his scientific career to act as a member of the scientific committees of various local administrations, in Italy and France, and as an expert for international agencies like OECD and DG Regio. It is therefore not by chance that, during his scientific life, Roberto put forward suggestions on policy structure, design and implementation, at regional and urban level, always from an innovative perspective with respect to the existing practices.

In the field of regional policies, Roberto worked on the justification of regional policies, as well as on their efficient design and implementation. During the 1990s, Roberto was concerned with the justification of regional policies when he entered the debate on the advantages and disadvantages of the constitution of a Single Market for lagging regions. Contrary to the general belief of that time, Roberto was convinced that “Objective 1 regions would not only benefit less from the creation of the Single Market, due to their weaker economic structure, but they will also suffer directly from some of the harmonization regulations implied by the 1992 program and from the consequences of the decision to move rapidly towards European Economic and Monetary Union” (Camagni 1992b, pp. 361–362), once again highlighting the importance of regional structural policies. This determination derived from Roberto's (at that time) embryonic idea that regions compete on the basis of absolute advantages (Chap. 5), an aspect in which Roberto found strong justification for structural funds, and for allocating them on the basis of efficiency principles. Within lagging regions, areas exhibiting a greater capacity to evolve, change, and adjust to novelties (the well-known milieu innovateurs) should be prioritized in terms of policy interventions; from their dynamics, development could start and spread to less dynamic areas (Camagni 1992b).

Another idea rooted in Roberto's approach to regional policy was his conviction that macroeconomic policies and trends exert a strong influence on regional growth. In a recent joint work, Roberto and myself argued that, as was the case in the 1992 devaluation of the lira in Italy, also the widening of the spread—the risk premium requested on public bonds with respect to riskless bonds—that hit many European countries during the 2011–2012 crisis period produced asymmetric regional shocks (Camagni and Capello 2015; Chap. 17). On applying the MASST model to forecast regional GDP growth in 2030 in all European regions of the 28 EU countries, a striking result was obtained from a baseline scenario built on the assumption of a “status quo” of the magnitude of intervention and allocation of regional funds: regional disparities would increase even under the assumption that the crisis would

end in late 2016. Roberto used this result once again to justify the importance of the necessity of structural funds in the period of economic downturn to counteract the increase in regional disparities caused by the recession period.

The above-mentioned 1992 work on regional policies contained some embryonic ideas on regional policy design and implementation, the most important one being that of the need to overcome the traditional efficiency vs. equity trade-off, Roberto relaunched and reinforced this idea when a robust scientific debate took place on the necessary “paradigm shift” of cohesion policies from a mainly redistributive logic, typical of the last century’s approach, to a development logic (OECD 2001; Bachtler and Yuill 2001) which called for endogenous development, continuous innovation, and a growth perspective.

The modern logic was accompanied by two opposite policy philosophies concerning its implementation. On the one hand, a more market-driven and institutional approach was proposed by two influential Reports (Sapir 2003; World Bank 2009; Gill 2011) which pointed out the superior efficiency of large metropolitan areas and the need to support them for the sake of aggregate well-being. On the other hand, a “place-based” regional policy philosophy was developed, under the influence of the OECD and the Barca report (Barca 2009), which based regional policies on place specificities and territorial assets. In a recent work, Roberto and myself have elaborated on these two opposite views by claiming that “what could be more productive in conceptual terms is demonstration that the long-standing supposed trade-off between ‘efficiency and equity’ or, in more recent terms, between competitiveness and cohesion goals, may be overcome and prove non-existent insofar as a renewed cohesion policy—addressing the development potential of almost all ‘places’ with new awareness and a new institutional sensitivity—could claim to achieve both goals at the same time” (Camagni and Capello 2015, p. 27; Chap. 17).

A recent regional policy debate at European level has focused on the innovation policy strategies most appropriate to help Europe overcome its knowledge creation gap with respect to the most dynamic, advanced and emerging, countries. Also in this field, Roberto could not be absent, and thanks to a large research project financed by ESPON (European Spatial Observation Network)⁴, he proposed a thorough interpretation of innovation policies that enriched the one proposed by the smart specialization strategy, the new regional innovation policy framework suggested at European level (Foray 2009, 2014; McCann and Ortega-Argilés 2014). According to Roberto, the recognition of the existence of different patterns of innovation for each region, developed by his school, paved the way towards a renewed, spatially sound inclusion of the smart specialization strategy into an appropriate regional innovation policy framework, along lines similar to the reform of the EU regional development funds (EC 2010). On the basis of regional innovation patterns, in fact, Roberto elaborated what he termed smart innovation

⁴I refer here to the above-mentioned “KIT—Knowledge-Innovation-Territory” project for ESPON 2013 Programme, Luxembourg, 2010.

policies, i.e. “those policies able to increase the innovation capability of an area by boosting effectiveness of accumulated knowledge, fostering new applications and diversification, enlarging and deepening the local knowledge base, starting from local specificities and the established innovation patterns in each region” (Camagni and Capello 2013, p. 357; Chap. 16).

While projects can easily emerge from a bottom-up approach, the general strategy of each region cannot be left to single administrative entities; rather, it has to be built according to the “type of innovative pattern” which characterizes a local economy. The advantage of this method is that it limits the risk of local lobbies and private interests pushing the strategy far away from social interests, and from the real needs of the region.

Roberto elaborated further on innovation policies. He was inspired by the recently developed hermeneutic approach (Cusinato and Philippopoulos-Mihalopoulos 2016), which “explores the sources of creativity and knowledge in depth, and it adds a symbolic and emotional dimension which links together places (‘landscapes’) and local collectivities, physical contexts and economic actors in a single process of knowledge creation” (Camagni 2016, p. 354; Chap. 18). In this regard Roberto analysed the conditions for renewed policy based “not just on traditional functional elements (human capital, externalities, or external linkages, although these maintain their importance), but mainly on symbolic and cognitive elements (codes, representations, languages, values) replicating the ways in which individuals, groups and communities fully develop their creative potential through synergy, associative thinking, interaction and cooperation in meaningful and recognized places” (Camagni 2016, p. 354; Chap. 16). In particular, “the process of policy design should have been inclusive, being based on the empowerment of a floor, as wide as possible, of local stakeholders, institutions, associations and individuals. Citizens’ participation in urban decision-making seemed crucial: diffused imagination and grass-roots experience can be more easily given voice and translated into actual projects (Camagni 2007, 2011). Urban strategic planning could also gain creativity and robustness when it abandons the old-fashioned corporate-like procedures typical of the 1990s and acquires an inclusive character by promoting citizens’ participation and public/private partnership (Healey 2001)” (Camagni 2016, p. 352; Chap. 16).

On reading this work, the interpretative power of Roberto’s mind is clearly apparent. The most theoretical, conceptual and abstract approach, at first glance totally detached from the reality, assumes a practical usefulness, fascinating the reader with the normative consequences reached.

1.5.2 On Spatial Planning and Territorial Cohesion

Roberto’s passion for the interpretation of spatial phenomena induced him to examine the most efficient design and implementation strategies in the field of spatial planning.

During the 1990s, under the influence of his wife Maria Cristina Gibelli, a professor of urban planning, Roberto became interested in strategic planning, and

started to work on it with his wife. They produced papers able to clarify the distinction between traditional, top-down, planning tools and the new strategic planning one, without neglecting some of its limitations, and suggesting how the correct design and implementation of strategic planning should yield the highest returns from its implementation (Camagni 1996a; Gibelli 1996). Roberto claimed that the new urban planning tools—based on negotiation between public and private actors, and transferable development rights—indubitably made it possible to deal with many problems that the previous regulatory planning tradition had failed to resolve. But by themselves the new tools were certainly not able to acquire additional resources. In fact, the full achievement of fiscal objectives depended on their implementation, on the political will in their regard, and on the determination to pursue public interests while ensuring a fair level of profitability for entrepreneurial initiative and rewards for private innovative capacity and strategic design. None of these were elements intrinsic to the new urban planning tools. The objectives of planning equity and efficacy could be achieved in practice through substantial innovations in administrative transparency and in the accountability of administrations to the community (Camagni 2003; Chap. 19).

Enlarging the field of urban planning to the spatial one, Roberto developed a research programme covering more than two decades, during which he started from a clear and measurable definition of what he thought should be the modern aims of spatial planning. Roberto's seminal idea in the field of spatial planning sprang from his consideration that the main goal of spatial planning should be indicated in "the achievement of territorial sustainability and that this goal defines the general and prospective role of spatial planning in a modern and aware society: spatial planning represents the appropriate institutional, technical and policy context for managing the territorial dimension of sustainability" (Camagni 2003, p. 25; Chap. 19). In fact, among the various dimensions of sustainable development—the technological, the behavioural (linked to life-styles in affluent societies) and the diplomatic one (referring to the international strategies to assure cooperation among countries at different development levels, with different development expectations)—Roberto highlighted a new one, the territorial dimension, referring to an ordered, resource-efficient and environmental-friendly spatial distribution of human activities.

With a strong rationality and logic, Roberto highlighted the bi-directional logical relationship between spatial planning and urban sustainability. Sustainability provided the general goal for spatial planning, while spatial planning provided the major institutional context and effective policy tools with which to attain territorial sustainability, thus strengthening the concept and allowing it to be translated into an effective action. The multisectoral nature of both elements was at the basis of this strong relationship; Roberto claimed that "sustainability derives from a positive, synergetic co-evolution of the economic, social, environmental and cultural dimensions of the society. On the other hand, spatial planning finds its *raison d'être* in the necessary integration of the different policy tools which have an impact on the territory" (Camagni 2003, p. 25; Chap. 19).

With these conceptual ideas in mind, when a fuzzy concept of territorial cohesion was launched in the policy field, and the engagement of European research and

institutions in the new field of Territorial Impact Assessment (TIA) (CMSP 1999; European Commission 2004) was required, Roberto was ready to take up the challenge by providing a definition of territorial cohesion on the basis of modern and advanced policy goals of spatial planning (Camagni 2006, 2009c; Chap. 20), on which to base a methodological tool for a territorial impact assessment. Resuming his seminal ideas on sustainability (Camagni 1998; Chap. 13), Roberto interpreted territorial cohesion as the territorial dimension of sustainability, with a positive and a normative connotation at the same time (i.e. it defines a condition and a policy goal). Territorial cohesion operates by integrating different dimensions: economic, social, and environmental (Camagni 2005b), with three main goals to achieve, namely (Camagni 2006, p. 139; Chap. 20): (i) territorial efficiency, interpreted as resource-efficiency with respect to energy, land and natural resources; competitiveness of the economic system and attractiveness of the local territory; internal and external accessibility; (ii) territorial quality, i.e. the quality of the living and working environment; comparable living standards across territories; similar access to services of general interest and to knowledge; (iii) territorial identity, defined as the presence of “social capital”; ability to develop shared visions of the future; local know-how and specificities, productive “vocations” and competitive advantage of each territory. Roberto elaborated on the idea that these three objectives can be achieved only through an integrated approach which ensures the virtuous integration and positive co-evolution of the three main territorial sub-systems—economic, social, and physical-natural—in their spatial manifestation or phenomenology, an idea that was already present, in embryonic form, in his urban sustainability definition.

Building the concept further, by directing two ESPON research projects on TIA⁵, Roberto developed an operational model (the TEQUILA—SIP model) able to assess the impact of programmes and projects on the different components of territorial cohesion (Camagni 2006; Chap. 20), which is still the only quantitative tool with which to assess the impact of programmes and projects on territorial cohesion.

1.6 Towards a Conclusion: A Life Spent in Search of the Unknown

Writing this introduction on Roberto’s seminal ideas made me once again aware of the richness of his work, but not only this. Before I began writing, I was worried about the difficulty of producing a coherent piece of scientific work, and not just a patchwork of ideas developed in more than 40 years of scientific life. I was impressed by the ease with which I could find a *fil rouge* in the development of

⁵I refer here to the ESPON projects “Territorial Impact Assessment of Transport and Agricultural Policies—TIPTAP”, 2008–2009 and “ARTS-Assessment of Regional and Territorial Sensitivity to EU Policies”, 2010.

Roberto's ideas over years of serious and constant work developed with passion, dedication and true intellectual curiosity, building through time a rich, innovative and attractive research programme.

I am convinced that Roberto is a unique example for young scholars, who in modern times are sometimes more attracted by fashionable theories and models. They often take an a-critical approach just to be accepted in fashionable scientific communities. They sacrifice their own interests or, even worse, they are convinced that being followers of fashionable and well-known ideas is more of interest than being pioneers in new fields.

Roberto has always been a pioneer in whatever field attracted his interest. He assumed all the risks of this behaviour. I still remember how difficult the publication of his "city network" theory was. It was rejected by colleagues editing international collected volumes, at that time the most prestigious scientific channel through which to publish. He did not get depressed, however, and waited until an open-minded scientist like Peter Nijkamp understood the richness of his contribution and published it. The reward for his pioneering behaviour was high personal satisfaction in moving the knowledge frontier in regional and urban economics forward, and in being a free mind in search of solid scientific explanations and tools to satisfy his hunger for novelty.

The international regional science scientific community, both students and scholars, all institutions dealing with territorial issues at all levels—European, national and local—and the discipline itself owe a great deal to Roberto. He devoted a great deal of time and passion to the international regional science community. He guaranteed the necessary creation and prosperous development of important associations. He was one of the founding fathers of the Italian section of the Regional Science Association International (AISRe) in the early 1980s, and he was President of the European Regional Science Association in a period of radical institutional change of that association beginning of the 2002. Together with his friend Antoine Bailly, at that time President of the Regional Science Association International, he supported the introduction of the universal membership rule, moving decisively towards a more inclusive membership system, and greatly enlarging the international community.

However, I am convinced that I am the person who owes Roberto the most. On many occasions I have thought how lucky I was to meet Roberto. He was not only my scientific guide; through his behaviour, he taught me to follow my interests, my instinct, my research plans, to bring my own ideas forward despite the difficulties, to face challenges that at a first glance seemed impossible (like writing a textbook!), to believe that what is worked on seriously always has a value, and to understand that working in a team and building a "school of thought" are the main goals for an academic. He taught me especially that all this has to be achieved with happiness, dedication, passion, and a high quality of life—the ingredients necessary for the development of an intriguing and long-lasting research programme. Thanks Roberto!

References

- Alonso W (1964) Location and land use: towards a general theory of land rent. Harvard University Press, Cambridge, MA
- Alonso W (1973) Urban zero population growth. *Daedalus* 102(4):191–206
- Aydalot P, Camagni R (1986) Tertiariation et Développement des Métropoles: un Modèle de Simulation du Développement Regional. *Rev Econ Rég Urbain* 2:171–186
- Bachtler J, Yuill D (2001) Policies and strategies for regional development: a shift in paradigm? Regional and industrial policy research paper, No 46, University of Strathclyde, Glasgow
- Bagnasco A (1977) *Tre Italie. La Problematika Territoriale dello Sviluppo Italiano*. Il Mulino, Bologna
- Barca F (2009) An agenda for the reformed cohesion policy. Report to the Commissioner for Regional Policy, Brussels, April
- Baumol WJ (1967) Macroeconomics of unbalanced growth: the anatomy of urban crisis. *Am Econ Rev* 57(3):415–426
- Becattini G (ed) (1975) *Lo Sviluppo Economico della Toscana con Particolare Riguardo all'Industrializzazione Leggera*. Guaraldi, Florenz
- Becattini G (1990) The Marshallian industrial district as a socio-economic notion. In: Pyke F, Becattini G, Sengenberger W (eds) *Industrial districts and interfirm cooperation in Italy*. International Institute of Labour Studies, Geneva, pp 37–51
- Boschma R (2005) Proximity and innovation. A critical assessment. *Reg Stud* 39(1):61–74
- Brandsma A, Kancs d'A, Persyn D (2015) Modelling agglomeration and dispersion in RHOMOLO. *Pap Reg Sci* 94(S1):S197–S222
- Breheny M (ed) (1992) *Sustainable development and urban form*. Pion, London
- Brusco S (1982) The Emilian model: productive decentralisation and social integration. *Camb J Econ* 6:167–184
- Camagni R (1985) Spatial diffusion of pervasive process innovation. *Pap Reg Sci Assoc* 58(1):83–95
- Camagni R (1991a) Local *Milieu*, uncertainty and innovation networks: towards a new dynamic theory of economic space. In: Camagni R (ed) *Innovation networks: spatial perspectives*. Belhaven-Pinter, London, pp 121–144
- Camagni R (1991b) Regional deindustrialization and revitalization processes in Italy. In: Rodwin L, Sazanami H (eds) *Industrial change and regional economic transformation*. Harper Collins, London, pp 137–167
- Camagni R (1992a) *Economia Urbana: Principi e Modelli Teorici*. La Nuova Italia, Rome. French version (1996) *Economie Urbaine*. Economica, Paris
- Camagni R (1992b) Development scenarios and policy guidelines for the lagging regions in the 1990s. *Reg Stud* 26(4):361–374
- Camagni R (1994) From city hierarchy to city networks: reflections about an emerging paradigm. In: Lakshmanan TR, Nijkamp P (eds) *Structure and change in the space economy: festschrift in honor of martin beckmann*. Springer, Berlin, pp 66–87
- Camagni R (1996a) *La Città come Impresa, l'Impresa come Piano, il Piano come Rete: Tre Metafore per Intendere il Significato del Piano in Condizioni di Incertezza*. Pianificazione Strategica e Gestione dello Sviluppo Urbano. Alinea, Florenz, pp 83–98
- Camagni R (ed) (1996b) *Economia e Pianificazione della Città Sostenibile*. Il Mulino, Bologna, pp 53–82
- Camagni R (1996c) *Principes et Modèles de l'économie Urbaine*. Economica, Paris
- Camagni R (1998) Sustainable urban development: definition and reasons for a research programme. *Int J Environ Pollut* 10(1):6–26
- Camagni R (1999) *La Ville comme Milieu: de l'Application de l'Approche GREMI à l'évolution Urbaine*. *Rev Econ Rég Urbain* (3):591–606
- Camagni R (2002) On the concept of territorial competitiveness: sound or misleading? *Urban Stud* 39(1):2395–2411

- Camagni R (2003) Integrated spatial planning: why and how? In: Sustainable spatial development: strengthening intersectoral relations. Proceedings of the conference, Budapest, Mar 2003
- Camagni R (2005a) *Economía Urbana*. Antoni Bosch, Barcelona
- Camagni R (2005b) The rationale for territorial cohesion: issues and possible policy strategies. In: Boscaino P (ed) Present and future of the European spatial development perspective. Ministero delle Infrastrutture e dei Trasporti, Alinea, Florenz, pp 121–138
- Camagni R (2006) Territorial impact assessment – TIA: a methodological proposal. *Sci Reg – Ital J Reg Sci* 5(2):135–146
- Camagni R (2007) Territorial development policies in the European model of society. In: Faludi A (ed) Territorial cohesion and the European model of society. Lincoln Institute of Land Policy, Cambridge, MA, pp 129–144
- Camagni R (2008) Regional competitiveness: towards a concept of territorial capital. In: Capello R, Camagni R, Fratesi U, Chizzolini B (eds) Modelling regional scenarios for the enlarged Europe. Springer, Berlin, pp 33–48
- Camagni R (2009a) Territorial capital and regional development. In: Capello R, Nijkamp P (eds) Handbook of regional growth and development theories. Edward Elgar, Cheltenham, pp 118–132
- Camagni R (2009b) Agglomeration, hierarchy, urban rent and the city. *Sci Reg – Ital J Reg Sci* 8(3):127–150
- Camagni R (2009c) Territorial impact assessment for European regions: a methodological proposal and an application to EU transport policy. *Eval Program Plann* 32(4):342–350
- Camagni R (2011) Creativity, culture and urban milieux. In: Fusco Girard L, Baycan T, Nijkamp P (eds) Sustainable city and creativity. Ashgate, Farnham, pp 183–198
- Camagni R (2016) Towards creativity-oriented innovation policies based on a hermeneutic approach to the knowledge-space nexus. In: Cusinato A, Philippopoulos-Mihalopoulos A (eds) Knowledge-creating milieus in Europe: firms, cities, territories. Springer, Berlin, pp 341–358
- Camagni R, Capello R (1990) Towards a definition of the manoeuvring space of local development initiatives: Italian success stories of local development – theoretical conditions and practical experiences. In: Stöhr W (ed) Global challenge and local responses. Mansell, London, pp 328–353
- Camagni R, Capello R (2002) Milieux innovateurs and collective learning: from concepts to measurement. In: Acs Z, de Groot H, Nijkamp P (eds) The emergence of the knowledge economy: a regional perspective. Springer, Berlin, pp 15–45
- Camagni R, Capello R (2004) The city network paradigm: theory and empirical evidence. In: Capello R, Nijkamp P (eds) Urban dynamics and growth: advances in urban economics. Elsevier, Amsterdam, pp 495–532
- Camagni R, Capello R (2005) Urban milieux: from theory to empirical findings. In: Boschma RA, Kloosterman RC (eds) Learning from clusters. Springer, Berlin, pp 249–274
- Camagni R, Capello R (2010) Macroeconomic and territorial policies for regional competitiveness: an EU perspective. *Reg Sci Policy Prac* 2(1):1–19
- Camagni R, Capello R (2011) Spatial scenarios in a global perspective: Europe and the Latin Arc countries. Edward Elgar, Cheltenham
- Camagni R, Capello R (2012) After-crisis scenarios for the European regions. *Stud Reg Sci* 42(1):3–24
- Camagni R, Capello R (2013) Regional innovation patterns and the EU regional policy reform: towards smart innovation policies. *Growth Chang* 44(2):355–389
- Camagni R, Capello R (2015) Rationale and design of EU cohesion policies in a period of crisis. *Reg Sci Policy Prac* 7(1):25–49
- Camagni R, Cappellin R (1981) European regional growth and policy issues for the 1980s. *Built Environ* 7(3/4):162–171
- Camagni R, Cappellin R (1985) Sectoral productivity and regional policy. Document, Commission of the European Communities, Bruxelles

- Camagni R, Diappi L (1991) Soudy 3: a supply oriented urban dynamics model with innovation and synergy effects. In: Boyce D, Nijkamp P, Shefer D (eds) *Regional science: retrospect and prospect*. Springer, Berlin, pp 339–358
- Camagni R, Maillat D (eds) (2006) *Milieux innovateurs: Théorie et politiques*. Economica, Paris
- Camagni R, Diappi L, Leonardi G (1986) Urban growth and decline in a hierarchical system: a supply-oriented urban dynamic approach. *Reg Sci Urban Econ* 16(1):145–160
- Camagni R, Diappi L, Stabilini S (1994) City networks: an analysis in the Lombardy region in terms of communication flows. In: Cuadrado J, Nijkamp P, Salva P (eds) *Moving frontiers: economic restructuring, regional development and emerging networks*. Avebury, Aldershot, pp 127–150
- Camagni R, Capello R, Nijkamp P (1998) Towards sustainable city policy: an economy-environment-technology nexus. *Ecol Econ* 24(1):103–118
- Camagni R, Gibelli MC, Rigamonti P (2002) Urban mobility and urban form: the social and environmental costs of different patterns of urban expansion. *Ecol Econ* 40(2):199–216
- Camagni R, Maillat D, Mattéaccioli A (eds) (2004) *Ressources Naturelles et Culturelles, Milieux et Développement Local*. EDES, Neuchatel
- Camagni R, Capello R, Caragliu A (2013) One or infinite optimal city sizes? In search of an equilibrium size for cities. *Ann Reg Sci* 51(2):309–341
- Camagni R, Capello R, Caragliu A (2014) The rise of second rank cities: what role for agglomeration economies? *Eur Plan Stud*. doi:[10.1080/09654313.2014.904999](https://doi.org/10.1080/09654313.2014.904999)
- Camagni R, Capello R, Caragliu A, Fratesi U (2015) Territorial scenarios in Europe: growth and disparities beyond the economic crisis. *Eur Reg* 21(4):190–209
- Camagni R, Capello R, Caragliu A (2016) Agglomeration economies and urban growth: spatial context and structural evolution behind urban growth. *Pap Reg Sci* 94(1):133–159
- Campos-Venuti G (1967) *Amministrare l'Urbanistica*. Einaudi, Torino
- Capello R (1988) *La Diffusione Spaziale dell'Innovazione: il Caso del Servizio Telefonico*. *Econ Pol Ind* 58:141–175
- Capello R (1998) *Economies d'Echelle et Taille Urbaine: Théorie et Etudes Empiriques Révisités*. *Rev Econ Rég Urbaine* 1:43–62
- Capello R (2000) The city-network paradigm: measuring urban network externalities. *Urban Stud* 37(11):1925–1945
- Capello R (2002) Urban rent and urban dynamics: the determinants of urban development in Italy. *Ann Reg Sci* 36(4):593–611
- Capello R (2007a) *Regional economics*, 2nd edn. Routledge, London
- Capello R (2007b) A forecasting territorial model of regional growth: the MASST model. *Ann Reg Sci* 41(4):753–787
- Capello R (2009) Macroeconomic regional growth models: theoretical, methodological and empirical contributions of Italian scholars. *Sci Reg – Ital J Reg Sci* 8(3):59–80
- Capello R, Camagni R (2000) Beyond optimal city size: an evaluation of alternative urban growth patterns. *Urban Stud* 37(9):1479–1497
- Capello R, Caragliu A (2016) After crisis scenarios for Europe: alternative evolutions of structural adjustments. *Camb J Reg Econ Soc* 9(1):81–101
- Capello R, Faggian A (2002) An economic-ecological model of urban growth and urban externalities: empirical evidence from Italy. *Ecol Econ* 40(2):181–198
- Capello R, Fratesi U (2012) Modelling regional growth: an advanced MASST model. *Spat Econ Anal* 7(3):293–318
- Capello R, Lenzi C (eds) (2013) *Territorial patterns of innovation: an inquiry of the knowledge economy in European regions*. Routledge, London
- Capello R, Camagni R, Chizzolini B, Fratesi U (2008) *Modelling regional scenarios for the enlarged Europe: European competitiveness and global strategies*. Springer, Berlin
- Capello R, Caragliu A, Nijkamp P (2011a) Knowledge and social capital: increasing returns in regional growth. *Stud Reg Sci* 41(1):95–116

- Capello R, Fratesi U, Resmini L (2011b) Globalisation and regional growth in Europe: past trends and scenarios. Springer, Berlin
- Capello R, Caragliu A, Fratesi U (2014) Modelling regional growth between competitiveness and austerity measures: the MASST3 model. *Int Reg Sci Rev* 40(1):38–74
- Capello R, Caragliu A, Fratesi U (2015) Global trends and the economic crisis: future alternative European growth strategies. *Technol Forecast Soc Chang* 98:120–136
- Cappellin R (1983) Osservazioni sulla distribuzione inter e intraregionale delle attività produttive. In: Fuà G, Zacchia C (a cura di) *Industrializzazione senza fratture*. Il Mulino, Bologna, pp 241–271
- Carlino G (1980) Contrast in agglomeration: New York and Pittsburgh reconsidered. *Urban Stud* 17(3):343–351
- CMSP – Council of Ministers Responsible for Spatial Planning (1999) *European Spatial Development Perspective (ESDP)*. European Commission, Brussels
- Cusinato A (2007) Propulsive or parasitic city? A reassessment of Baumol’s model on cost disease in a context of endogenous development. *Sci Reg – Ital J Reg Sci* 6(3):1–13
- Cusinato A, Philippopoulos-Mihalopoulos A (eds) (2016) *Knowledge-creating milieus in Europe: firms, cities, territories*. Springer, Berlin, pp 341–358
- Dei Ottati G (2003) The governance of transactions in the industrial district: the ‘community market’. In: Becattini G, Bellandi M, Dei Ottati G, Sforzi F (eds) *From industrial districts to local development*. Edward Elgar, Cheltenham, chap. 4, org. edn. (1987) *Il Mercato Comunitario*. In: Becattini G (eds) *Mercato e Forze Locali: il Distretto Industriale*. Il Mulino, Bologna, pp 117–141
- Dematteis G (1985) Verso strutture urbane reticolari. In: Bianchi G, Magnani I (eds) *Sviluppo multiregionale: teorie, metodi, problemi*. FrancoAngeli, Milano, pp 121–132
- Dematteis G (1990) Modelli urbani a rete: considerazioni preliminari. In: Curti F, Diappi L (eds) *Gerarchie e reti di città: tendenze e politiche*. F. Angeli, Milano, pp 27–48
- Diappi L, Pompili T (1990) Sistemi di città come reti di interazione: un approccio dinamico di tipo loeschiano. In: Martellato D, Sforzi F (eds) *Studi sui sistemi urbani*. Franco Angeli, Milano, pp 341–367
- Emanuel C, Dematteis G (1990) Reti urbane minori e deconcentrazione metropolitana nella Padania centro-occidentale. In: Martellato D, Sforzi F (eds) *Studi sui sistemi urbani*. Franco Angeli, Milano, pp 233–262
- European Commission (1999) *Sixth periodic report on the social and economic situation of regions in the EU*. European Commission, Brussels
- European Commission (2004) *A new partnership for cohesion, third report on economic and social cohesion*, Brussels
- European Commission (2005) *Territorial state and perspectives of the European union, scoping document and summary of political messages*, May 2005
- European Commission (2010) *Europe 2020. A strategy for smart, suitable and inclusive growth*. Communication from the Commission, COM(2010)2020
- Foray D (2009) Understanding smart specialisation. In: Pontikakis D, Kyriakou D, van Bavel R (eds) *The question of R&D specialisation*. JRC, European Commission, Director General for Research, Brussels, pp 19–28
- Foray D (2014) *Smart specialisation, opportunities and challenges for regional innovations policy*. Routledge, London
- Fujita M (1985) Existence and uniqueness of equilibrium and optimal land use. *Reg Sci Urban Econ* 15(1):295–324
- Gibelli MC (1996) Tre famiglie di piani strategici. verso un modello ‘reticolare’ e ‘visionario’. In: Curti F, Gibelli MC (eds) *Pianificazione Strategica e Gestione dello Sviluppo Urbano*. Alinea, Florenz, pp 15–54
- Gill I (2011) Improving regional development policies. In: *OECD regional outlook*. OECD, Paris, pp 175–184
- Gramsci A (1934) *Quaderni del carcere*. Editori Riuniti, Rome

- Griliches Z (1957) Hybrid corn: an exploration in the economics of technological change. *Econometrica* 25(4):501–525
- Hägerstrand T (1966) Aspects of the spatial structure of social communication and the diffusion of innovation. *Pap Reg Sci Assoc* (16):27–42
- Haughton G, Hunter C (1994) Sustainable cities. Regional Studies Association, Jessica Kingsley, London
- Healey P (2001) New approaches to the content and process of spatial development frameworks. In: *Towards a new role for spatial planning*. OECD, Paris
- Henderson JV (1974) The sizes and types of cities. *Am Econ Rev* 64(4):640–656
- Hoch I (1972) Income and city size. *Urban Stud* 9(3):299–328
- Isard W (1956) *Location and space-economy*. MIT Press, Cambridge, MA
- Krugman P (1991) *Geography and trade*. MIT Press, Cambridge, MA
- Krugman P (1998) *Pop internationalism*. MIT Press, Cambridge, MA
- Magnani I (1971) *La teoria pura dell'equilibrio della città e gli effetti delle imposte*. F. Angeli, Milano
- Mansfield E (1961) Technological change and the rate of imitation. *Econometrica* 29(4):741–766
- McCann P, Ortega-Argilés R (2014) The role of the smart specialisation agenda in a reformed EU cohesion policy. *Sci Reg – Ital J Reg Sci* 13(1):15–32
- Nanetti R (1988) *Growth and territorial policies: the Italian model of social capitalism*. Pinter and Columbia University Press, London and New York
- Nitti F (1903) *Scritti sulla questione meridionale*. Laterza, Bari
- OECD (2001) *OECD territorial outlook*. OECD, Paris
- Perucca G (2013) A redefinition of Italian macro-areas: the role of territorial capital. *Riv Econ Stat del Terr* 2:35–63
- Perucca G (2014) The role of territorial capital in local economic growth: evidence from Italy. *Eur Plann Stud* 22(3):537–562
- Porter M, Ketels S (2003) *UK competitiveness: moving to the next stage*. DTI Economics Paper 3. Department of Trade and Industry, London
- Rowthorn RE (1975) What remains of Kaldor's Law? *Econ J* 85(337):10–19
- Sapir A (2003) *An agenda for a growing Europe*. The sapir report to the EU, Brussels, July
- Shefer D (1973) Localization economies in SMSA'S: a production function analysis. *J Reg Sci* 13(1):55–64
- Silva E (1964) *Elementi di economia urbanistica*. Milano, Giuffré
- Storper M (1997) *The regional world: territorial development in a global economy*. Guildford Press, New York
- Sweikauskas L (1975) The productivity of city size. *Q J Econ* 89(3):393–413
- Torre A, Rallet A (2005) Proximity and localization. *Reg Stud* 39(1):47–59
- Treyz GI (1993) *Regional economic modeling: a systematic approach to economic forecasting and policy analyses*. Kluwer, Dordrecht
- Varga A (2015) Place-based, spatially blind or both? Challenges in estimating the impacts of modern development policies: the case of the GMR policy impact modeling approach. *Int Reg Sci Rev* 40(1):12–37
- World Bank (2009) *World development report*. World Bank, Washington