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# From the Role of Space in Knowledge Creation to Scenario Building Through Territorial Capital

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## 2.1 Introduction

In every branch of science, there have been and continue to be professionals whose analytical and creative ability pushes the boundaries of the knowledge available to us. Roberto Camagni is without any doubt one of those professionals. As this book is pointing out, his work has allowed for advances in three areas of Regional and Urban Economics: regional analysis per se; urban theory; and the contribution of new criteria in the field of regional and urban policy.

I believe there are two conditions that tend to coincide to advance scientific knowledge in any field. The first, unarguably, is to have both a great curiosity and a strong capacity for creation. The second is to apply patient dedication and unwavering effort throughout one's research and professional life. I am utterly convinced that Roberto Camagni fulfils both characteristics, and that it is just that—curiosity, creativity and hard work—which has allowed him to make contributions over more than four decades that have been, and will continue to be, a point of reference for any student of regional and urban issues.

In Roberto Camagni, the traits I describe above are accompanied by two virtues I personally value very highly: humility and generosity. Roberto has never been an self-satisfied man; he never does behave like an important person. On the contrary; on the numerous occasions that I have had the pleasure of his company at a broad range of academic events, conferences and debates, it has always been clear that his great intelligence is coupled with great modesty, with no hint of arrogance in either form or substance. Like the good Italian and Mediterranean people, Roberto is also a warm man. He is open, generous with his time and his dedication to all those who have approached him, and has a high sense of humour and of sarcasm (that “highest form of wit”). In short, Roberto is one of those people with whom one feels instantly

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at ease, and it does not take long to realise that to enjoy his friendship is really a very great privilege.

For all these reasons, I was deeply honoured by and eager to accept the invitation to participate in this book in honour of the contributions made to Regional Economics by Roberto Camagni, which, as I have said, is one of the three broad fields to which he has applied his constant dedication. It was no easy task to select a limited number of works that would be sufficiently representative of his contributions; the five eventually chosen are a clearly limited sample of a much more extensive and richer body scientific research.

However, I do not feel that the papers included in this section of the book broadly cover the main lines of work to which Roberto has dedicated a substantial part of his research and reflections within the field of Regional Economics: Innovation, and how and why it emerges and is diffused; territorial competitiveness; a development of the concept of Territorial Capital, which has always been dear to him; and a methodology to generate forecasts and projections in terms of the European regional landscape. The works on which I shall comment provide a highly innovative view on these four lines of research and my goal will be to highlight the elements which, in my opinion, lie at the core of each of them and how each has contributed to advancing studies in Regional Economy.

Before undertaking this analysis, I feel it is important to highlight a characteristic that has always been salient in Roberto's work. Not only in the texts on which I plan to comment, but in the vast majority of his work. Roberto almost never limits himself to developing purely theoretical or abstract concepts and aspects. We share an approach that leads us not only to seek to 'explain' the trends and processes observed in reality via a theoretical, formal approach, but also to seek to contribute to "bettering our environment". In other words, whilst recognising the importance of speculation and theoretical developments, his contributions always highlight ways in which the work could be applied to improve reality, to offer keys to potential political actions, to deduce outcomes from any rigorous analytical approach that seek to address problems and shortcomings that exist in the real world. This is an approach which, as I have mentioned, I share myself, and which is also favoured by many learned economists, including Alfred Marshall, Gunnar Myrdal, Arthur C. Pigou, William S. Jevons and Adam Smith himself. It is also in line with Alfred Marshall's motivation to study Economics, as cited by Nobel Prize winner Ronald H. Coase (1994, p. 171):

Marshall himself had come to Economics because he wanted to help eliminating poverty and in enhancing the quality of man and man's life. The economic system which Marshall studies always had this concrete character—it was a system which, leaving the study or the library, one could observe. And for Marshall it was important that one should get it right since it was this real system that one had to explain.

Roberto seeks invariably to ensure that his contributions are *applicable to reality*, both to *understand* the reality but even more so, to *improve* it. It is an approach that some economists do not share, or which they do not believe to be

important, but one which many of us feel should form a guideline for scientists in the field of social sciences, including Economics of course. It is well known that the potential inclusion of proposals and recommendations into theoretical research has been criticised by many economists on the basis of scientific “orthodoxy”, which rests, among others, upon Hume’s arguments and the demands of positivism. There are, of course, many others who do not share this position. Coase himself (1994, p. 47) was clearly opposed to this “orthodox” position:

I know, of course, that there are some economists who argue that Economics is a positive science and that all we can do is to explain the consequences that follow from various economic policies. . . Such self-restraint is I think unnecessary. We share (at least in the West) a very similar set of values, and there is a little reason to suppose that the value judgments of economists are particularly eccentric.

Roberto has always worked and continue to work within the realms of orthodoxy in his development of theoretical concepts and approaches to regional and urban economics. However, as I shall note accordingly, that does not stop him from contrasting his ideas or suggesting criteria and objectives in terms of the policies that may apply in each case.

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## 2.2 From Innovation and the Process of Spatial Diffusion to a Dynamic Theory of Economic Space

The first two texts covered in this part of the book are, in my view, closely linked. The first was published in 1985 (“Spatial Diffusion of Pervasive Process Innovation”) and the second in 1991 (“Technological change, uncertainty and innovation networks: towards a dynamic theory of economic space”). The *leitmotiv* in both cases lies in understanding how technological innovation comes about, in what context or environment it is most likely to arise and how that leads to a need to look at territory from a dynamic perspective.

Innovation, technological change and the mechanisms for their diffusion are among the key axes around which Roberto Camagni has focused his attention for several decades, and this is unquestionably an important topic for the understanding of regional development and the disparities in growth observed between different regions. The 1985 text is a seminal work. In Roberto’s own words, “the introduction of the spatial dimension in the analysis of the innovation diffusion is not just a further dimension to an already complex problem, but it also plays a part in highlighting a number of fundamental genetic aspects of actual diffusion processes”. I believe that the essential contribution of his approach to the topic lies in the development he proposed of the innovation diffusion process. Roberto offers a serious, original, theoretical, formal approach to the nature of diffusion processes that can be summarised as an envelope of two processes defined by the values of some parameters. It does not imply the ex-ante quantitative definition of an initial

asymptote and allows for the possibility of a non-symmetrical process in both the initial and the final phases.

Having developed the theoretical, formal part of the analysis, Roberto—with his ever-present desire to offer a pedagogical perspective—highlights some of the ideas most closely applicable to the corporate world and the companies decisions. He points out that for the individual firm; the adoption process (of innovation) is based on the phases and preconditions shown in a synthetic figure: the possibility of access to information; the estimation of profitability; and the evaluation of adjustment costs. He immediately goes on to add something that had clearly been overlooked: the spatial element is not neutral with respect to each of these phases because it determines the general *technological climate* and the market for those factors which have the greatest influence on the profitability of an innovation.

This consideration of the role of the territory is crucial. It can be accepted that in advanced economies, there is a certain spatial (or regional) homogeneity in terms of access to information. However, this is neither completely true nor completely acceptable. The economic “environment” in which companies operate not only requires analysis, but should also be explicitly taken into account, as it impacts innovation-related possibilities and decisions within companies. If one thing is clear, it is the fact that central regions are distinctly differentiated from peripheral regions in terms of the environment afforded to companies located within said regions, and this observation allows the author to look more closely still at the elements that comprise this “environment” and their influence on technology and innovation diffusion, and on decision-making processes.

To evidence the validity of his approach, Roberto included in the work under discussion a case study on the diffusion of industrial robotics in Italy. This analysis reveals extremely interesting, illustrative results. It becomes clear, for example, that the diffusion of robotics as a process of innovation shows a pattern which is fairly conservative. Starting from central regional nodes, it moved along the top branches of Northern Italy’s urban hierarchy and eventually reached the intermediate and peripheral regions through proximity or the decision-making channels of multiregional firms. In essence, the analysis reveals that advances in robotics are concentrated in the northern regions of the country, which are richer and have a more dynamic industrial sector. The periphery lags behind, with certain exceptions stemming from contacts with and/or links to companies in Turin and Piedmont, as well as Lombardy.

A number of years later, Roberto made his mark on a fairly simple idea put forward by Philippe Ayalot: the concept of *milieux innovateurs*, which allowed for in-depth analysis of why and how a climate develops in certain territories which promotes innovation and the adoption of new technologies. This led to an extensive series of contributions by Roberto and by a substantial number of other researchers, eventually including myself, which fuelled the debates of the GREMI (Groupe de Recherche Européen sur les Milieux Innovateurs) (Camagni and Maillat 2006). Nonetheless, the text published by Roberto in 1991, which is the second text selected for this section, anticipates and advances a series of *idée-forces* that underscore the author’s capacity for analysis.

Roberto Camagni pointed out back in 1991 that not only did the traditional, neoclassical theory not allow for an adequate explanation of how innovation is produced, but that it also failed to explain where it arises and how it is diffused. He goes on to cite the need to take into account the factors of market imperfection and uncertainty and incorporate the very nature of the Schumpeterian creative innovation processes, in contrast with the assumptions and deductions—without the time or the space factor—of the neoclassic model. If one accepts this approach, technological change can be interpreted and ‘stylised’ as follows: (a) it is irreversible; (b) it lies on a cumulative learning process; (c) it implies search and decision routines; (d) it implies the full commitment of all functions of the firm; (e) due to its dependence on internal learning processes it cumulatively builds on tacit, firm specific know-how and on intangible assets; and (f) its historical path may by no means be interpreted in terms of optimality. The learning processes may act as dynamic ‘entry-barriers’ with respect to possible, possibly more efficient, alternative technologies.

This approach gives rise to an analysis of the relationship between innovation processes and uncertainty. Roberto Camagni develops this topic with brilliance and a strong sense of pedagogy, which leads him to link sources of uncertainty with types of uncertainty (static and dynamic), as well as with the traditional instruments for coping with uncertainty, the outcomes and the new ‘operators’, which is where the local environment, or ‘milieu’, emerges as a key factor. This environment tends to reduce the degree of uncertainty at firms and in decisions related to the adoption of innovations and new technology.

Essentially, Roberto offers a far more in-depth view of *milieux innovateurs* than was offered upon the idea’s origins, which was softer and more conceptual in nature. Roberto breaks down why these ‘milieux’ allow firms, through a collective, socialised process, to reduce costs and enhance decision-making processes at local firms. The reasons pointed out by Camagni at the time were: (1) a collective information-gathering through informal interchange of information between firms operating in the same markets, signalling of success decisions on markets and technologies; (2) a function of signalling in terms of product image and reputation, cooperative advertising and supply of a sort of ‘quality certification’; (3) a collective learning process, mainly through skilled manpower mobility in the local/regional area; a collective process of definition of managerial styles and decision routines; an informal process of decision coordination, through interpersonal linkages, easier and faster information circulation on innovative decision-making, easier financial-industrial linkages, similar cultural background of decision-makers.

The foregoing underscores the idea that ‘proximity’ is an important factor, whether it be through the human resources available, through the enactment of informal contacts or through the synergy effects stemming from a common cultural, psychological and often political background. All of these elements of ‘proximity’ *fall within the territory*, which allows for an explanation of why innovation creation and diffusion is linked to specific spaces, particularly large metropolitan areas and ‘industrial districts’, ‘valleys’ and ‘corridors’. The ‘milieux’ thesis therefore offers a far better explanation of success than other concepts that have been studied in

regional analysis. What is clear is that the reduction of uncertainty is an intrinsic factor in innovation processes and the diffusion of new advances in terms of technology, management and forays into new markets. Roberto extols the virtues of cooperation—formal or informal—as opposed to competition in territories, and draws two highly pertinent conclusions: firstly, that technological progress means, above all, a reduction in uncertainty, and secondly that, in that respect, there are two key ‘operators’: the local ‘milieu’ and the ‘cooperation space’, as well as the possibility of trans-territorial network linkages between firms.

To some, Roberto Camagni’s statements might seem excessively informal or merely conceptual, but the fact is that his contributions have opened the door to a more robust, highly territorial understanding of innovation, as well as to the role of networks and to the key role of the local factors present in a certain *milieu*.

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### 2.3 Territorial Competitiveness: A Recurring Topic in Camagni’s Bibliography

One of Roberto Camagni’s truly important works is, without a doubt, the article published in 2002 in *Urban Studies*, entitled “On the concept of Competitiveness: Sound or Misleading?”. It is essentially a theoretical text which is highly robust and needs to be re-read several times to extract the fundamental contribution(s) of its content. It is by no means an isolated piece, as this has been a recurring theme in Roberto’s extensive bibliography, but it is a particularly noteworthy landmark.

The argument put forward by Roberto is that the concept of territorial competitiveness is theoretically sound, considering not only the role that the territory plays in providing competitive ‘environments’ to individual firms, but especially the role it plays in the process of knowledge accumulation and in the development of interpretative codes, models of cooperation and decisions on which the innovative progress of local companies is based. It is therefore clear that in terms of its general arguments, the article does not differ greatly from the two discussed above; rather, it links in very well with them, although its focus is the idea of competitiveness and the need to introduce the role of territory. Camagni also underscores, reiterating his own observations in 1991, as well as those of Capello (1999) and Keeble and Wilkinson (1999), that these processes result in a ‘socialised’ growth of knowledge, which is embedded not only in the internal culture of companies, individually considered, but in the local labour market or in the ‘local industrial atmosphere’.

In short, the paper at hand explores the role of territory in terms of how it offers tools or instruments for competitiveness which benefit individual firms, and demonstrates a clear conviction that, in the phase of globalisation that was already underway at that time, the issue of territorial competitiveness was of critical importance for regional development policies, even though the focus of the paper is essentially theoretical. In the article, Roberto Camagni looks at the Ricardian theory of comparative advantage, which does not appear to apply at the sub-national level. This theory assigns a role to every country in the international division of labour, whatever may be the level of efficiency and competitiveness of

its productive sectors. Roberto argues that the principle governing production, specialisation and trade is a principle of *absolute advantage*. This argument leads him to study the relationships between globalisation and localisation, or better still, local differentiation, where he highlights two possible extremes: on the one hand, the pessimistic position, merging (sometimes adding up) different and disparate concerns from the survival of local cultures to the fear about the economic and political power of multinational corporations; and on the other, the optimistic position, which says that there is no cause for concern because open markets have sufficient self-adjusting mechanisms to ensure local wellbeing and that the law of comparative advantage will assure each country a role in the international division of labour, regardless of what its international competitiveness may be.

Roberto Camagni puts forth a series of ideas which it is difficult to summarise here. It should be noted that he does not fully accept Krugman's ideas on the specialisation of trade, the relevance of imports to exports and static economies of scale (developing his arguments with enviable clarity). His criticism is stronger still when we move from countries—which are always Krugman's focus—to regions. In fact, Roberto goes as far as to uphold that, in his opinion, the law of comparative advantage does not hold in case of confrontation among local economies (inter-regional trade) and consequently the conclusion that each region will always be granted some specialisation and role in the interregional division of labour *is not valid*. An important statement indeed and an original one in the case of Regional Economics, which is based on the analysis of events at the intra-national or territorial level, rather than considering the country as a whole as the unit of reference. Establishing this starting point allows and invites a study of the *sources of regional competitiveness*, a topic which Roberto Camagni had already researched in several preceding works, referenced in the work under discussion here.

To my mind, the article is one of the most important, solid contributions Roberto has made to Regional Economics. It is an analysis that should be re-read now, because it continues to be a key reference. Ultimately, Roberto shows, in his own words, that “differently from the case of countries, cities and regions compete, on the international market, for goods and production factors, on the basis of an *absolute advantage principle*, and not of a *comparative advantage principle*. And this means that no efficient, automatic mechanism may grant each territory some role in the international division of labour, whatever its relative performance”. This leads him to argue that weak and lagging territories in terms of competitiveness of economic fabric, accessibility, quality of human and environmental factors, internal synergies and learning capabilities, risk exclusion and decline to a larger extent than in the past.

## 2.4 A Development of the Concept of Territorial Capital

Roberto Camagni's engaging study entitled "Regional Competitiveness: Towards a Concept of Territorial Capital" was originally included as a chapter of a collective book produced in 2008 by R. Capello, R. Camagni himself and other members of the team formed under their guidance at the Politecnico di Milano. The book was published by Springer (2008) under the title: '*Modelling regional scenarios for the enlarged Europe*'.

It is not, of course, just a chapter in a book. It is a well-crafted, ground-breaking piece of work. Not because the ideas Roberto sets forth are completely new; the concept of 'Territorial Capital' had already debuted in other publications, such as the OECD's *Territorial Outlook* in 1991, as well as articles by other authors and documents by the European Commission's DG Regio in 2005. However, none of those references offered such an in-depth analysis of the concept, its importance and its capacity to explain interregional development and disparities as Roberto's article did.

There was a good reason why this should be so. Roberto Camagni had had the opportunity to reflect on the topic in debates and developments around *milieux innovateurs* and other comparable categories of endogenous development. He was therefore obliged to pay attention to the intangible, atmosphere-type, local synergy and governance factors. Several years earlier, this had led Roberto Camagni himself and other authors (Putman, Camagni and Capello, Foray and Storper) to turn their attention to concepts such as social capital, relational capital, and finally territorial capital.

The concept may sound opaque or vague at best, but Roberto takes great pains to clarify it and ensure it is considered as a key factor in territorial analysis. "Territorial capital", then, is the sum of a series of components:

- A system of localised externalities, both pecuniary and technological
- A system of localised production activities, traditions, skills and know-hows
- A system of localised proximity relationships which constitute a capital (social, psychological and political) in that they enhance the static and dynamic productivity of local factors
- A system of cultural elements and values which attribute sense and meaning to local practices and structures
- A system of rules and practices defining a local governance model

Based on these components, Roberto proposes a possible theoretical taxonomy of "territorial capital" based on two dimensions: rivalry and materiality—which I don't have space to analyse more closely here. This allow him to construct diagrams of the traditional and innovative factors of territorial capital, including public resources and goods, private capital, social capital, relational capital, human capital, economies of agglomeration and connectivity (both internal and to other territories), cooperation networks and relational private services. Roberto Camagni's table of territorial capital (Table 6.1 in Chap. 6) offers a great deal of



clarity and is unquestionably one of Roberto Camagni's contributions to elucidating the components of territorial capital. In my view, it includes two key ideas: mixed goods and intangible goods, which in recent years have begun to attract substantial attention from researchers.

It is a shame, perhaps, that Roberto did not—to my knowledge—resume the empirical analysis of the components of territorial capital and the highly important segment of intangibles in particular. Because what truly sets this text apart is its capacity to organise and structure various concepts and factors, some of which had previously been explored separately when in fact they are closely linked.

In any case, there is no question that the analytical and forecasting model produced by the team at the Politecnico di Milano under the guidance of Roberta Capello and Roberto Camagni (the MASST model) benefited from this conceptual clarification of territorial capital undertaken by Roberto Camagni (Capello et al. 2008).

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## 2.5 Incorporating 'Scenarios' into Medium to Long-Term Regional Analyses and Forecasts

The final study selected for this part of the book ("After-crisis scenarios for the European regions") is by Roberto Camagni and Roberta Capello, and was published in 2012 in *Studies in Regional Science*. In the words of its authors, the main objective of the paper is to build after-the-crisis scenarios for European regions, using both qualitative reflections and the 'quantitative foresight' methodology created by the team based on the MASST regional econometric model. However, the contribution of the piece stems more directly from the reflections and the content of a project undertaken through the ESPON 2013 Programme, entitled '*SPAN-3: Spatial scenarios – new tools for regional and local territories*', which couples qualitative reflections with quantitative approaches based on the aforementioned econometric model.

The scenarios technique is well-known, though various approaches exist. Perhaps the differentiating factor here is that the methodology used is neither pure forecast nor pure foresight. The key is that an image of the future is constructed considering that a discontinuity will emerge (which lies in the structural breaks provoked by the crisis) and exploring the perception that economic agents and governments will have of such a break and its consequences. On that basis, three scenarios are outlined: (a) the *reference scenario*, based on the assumption that the structural changes caused by the crisis will be perceived, but that policies will not be aimed in a direction that allows them to be effective; (b) the *pro-active scenario*, in which the changes are perceived and taken into account and even anticipated by economic agents; and (c) the *reactive or defensive scenario*, in which the changes are not clearly perceived by economic agents and a defensive stance is adopted aimed at protecting existing structures, sectors and businesses. To a certain extent, the latter scenario would afford continuity with the past, ignoring or placing limited importance on the implications of the crisis.

It would make no sense for me to delve deeper into the construction of each of the scenarios, which are based on certain general driving forces—globalisation, technological changes, demography, settlement structure, energy and oil prices—which those who are unfamiliar with the work can find extensively detailed in the paper itself.

Based on my understanding of the work, the effort involved in constructing these scenarios and in taking into account and integrating the conducts and interrelations of the driving forces and the more quantitative estimates, has given rise to a set of robust, coherent results. The methodology is richer, of course, than one which might derive from a relatively sophisticated econometric model. Nobel prize winner Maurice Allais, whose dedication to quantitative economic analysis is well-known, criticised the work of economists who confuse analysis with a technical approach, or with simple methodological formalism, going as far as to say that “for almost 45 years, contemporary economic literature had developed too often in a totally erroneous direction with the construction of complexity artificial mathematical models detached from reality; and too often it is dominated more and more by mathematical formalism which fundamentally represents an immense regression” (Allais 1992, p. 34).

I do not know whether Roberta Capello or Roberto Camagni have read the highly interesting text by Allais on his understanding of economics, which includes other statements in keeping with the quote highlighted above. But I am certain that they both share the view—and the paper under discussion clearly evidences this—that when undertaking forecasts or projections, in this case on the performance of European regions post-crisis, it is absolutely vital to use both quantitative models and more qualitative approaches which not only take into account the main driving forces, but also how these driving forces and their consequences are perceived by economic agents and what alternative scenarios may exist.

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## 2.6 A Final Remark

To accept the challenge of commenting on Roberto Camagni’s contributions to Regional Economics naturally involved certain risks. The main one, perhaps, was the risk that I might fail to adequately pinpoint the core of his work, or to put it another way, the value his work has added and the validity of his approaches. This was coupled with an obvious challenge: the task was clearly “reductivist” in nature, focusing as it does on just five scientific contributions when Roberto Camagni’s research output is so much broader.

Naturally, I accept this latter limitation, and I also very much hope that he will not read these pages with dissatisfaction. Roberto has earned extensive respect worldwide as an economist strongly specialised in Regional and Urban Economics. That cannot be said of many researchers. It is something that happens, as I explained at the beginning of this text, when an author is able to generate new ideas and new approaches to topics that were already known and to other, lesser-known topics, through analytical rigour and creative capacity. Those have certainly

been the guiding principles of Roberto Camagni's work, and we all hope they will continue to be for many years to come.

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