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Roberto Camagni & Roberta Capello

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Regional Competitiveness and Territorial Capital: A Conceptual Approach and Empirical Evidence from the European Union

ROBERTO CAMAGNI and ROBERTA CAPELLO

Department of Building, Environment, Science and Technology (BEST), Politecnico di Milano Piazza Leonardo da Vinci, 32,
I-20133 Milan, Italy. Emails: Roberto.Camagni@polimi.it and Roberta.Capello@polimi.it

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CAMAGNI R. and CAPELLO R. Regional competitiveness and territorial capital: a conceptual approach and empirical evidence from the European Union, *Regional Studies*. Today, a selective pattern of regional growth is emerging to differentiate single regions' growth and determine a varied mosaic of development stories. This fact calls for more stringent and selective interpretations of the different regional assets defining growth strategies for each region, city or territory: in short, what is increasingly called 'territorial capital', and its efficient exploitation. The paper inspects in depth the concept of territorial capital and it conceptually highlights all elements that are embedded in this concept. The novelty of the empirical exercise lies in the treatment of the entire European territory at the same time.

Regional competitiveness and growth Territorial capital

CAMAGNI R. and CAPELLO R. 区域竞争力与地域资本：来自欧盟的经验证据与概念方法，区域研究。区域成长的选择性模式在今日逐渐用以分辨各区域的成长以及决定多元的发展故事。此一事实需要对不同区域、城市或地域运用其地区资产追求成长的策略进行更为严谨与选择性的诠释；简言之便是「地域资本」的概念及其有效的运用。本论文深度检视地域资本的概念，并在概念上强调镶嵌此一概念的所有元素。此一经验性运用的新颖之处在于同时将欧洲地区视为完整的一体。

区域竞争力与成长 地域资本

CAMAGNI R. et CAPELLO R. La compétitivité régionale et le capital territorial: une approche conceptuelle et des preuves empiriques provenant de l'Union européenne, *Regional Studies*. De nos jours, une distribution sélective de la croissance régionale commence à se manifester et à différencier la croissance des régions individuelles et à déterminer une mosaïque variée d'histoires de développement. Ce fait nécessite des interprétations plus strictes et sélectives des différents atouts régionaux qui déterminent les stratégies de croissance pour chaque région, grande ville ou territoire: en bref, ce que l'on appelle de plus en plus 'le capital territorial' et son exploitation efficace. L'article cherche à approfondir la notion de capital territorial et souligne sur le plan conceptuel tous les éléments que cette notion enchâsse. La nouveauté de cet exercice empirique réside dans le traitement simultané de l'ensemble du territoire européen.

Compétitivité et croissance régionales Capital territorial

CAMAGNI R. und CAPELLO R. Regionale Wettbewerbsfähigkeit und Territorialkapital: ein konzeptueller Ansatz und empirische Belege aus der Europäischen Union, *Regional Studies*. Zurzeit bildet sich ein selektives Muster des regionalen Wachstums heraus, das das Wachstum einzelner Regionen differenziert und ein vielfältiges Mosaik von Entwicklungsgeschichten festlegt. Dieser Umstand erfordert eine strengere und selektivere Interpretation der verschiedenen regionalen Aktivposten, die die Wachstumsstrategie der jeweiligen Region, Stadt oder Gegend definieren – also der Posten, die immer häufiger als 'Territorialkapital' bezeichnet werden –, sowie ihrer effizienten Erschließung. In diesem Beitrag wird das Konzept des Territorialkapitals ausführlich untersucht, und es werden auf konzeptuelle Weise sämtliche in dieses Konzept eingebetteten Elemente herausgearbeitet. Das Neue an dieser empirischen Arbeit liegt in der gleichzeitigen Behandlung des gesamten europäischen Gebiets.

Wettbewerbsfähigkeit und Wachstum von Regionen Territorialkapital

CAMAGNI R. y CAPELLO R. Competitividad regional y capital territorial: un enfoque conceptual y la evidencia empírica de la Unión Europea, *Regional Studies*. Hoy día está apareciendo un modelo selectivo de crecimiento regional para diferenciar el crecimiento de cada región y determinar un mosaico variado de relatos de desarrollo. Este hecho propone una interpretación más exigente y selectiva de los diferentes activos regionales que definen las estrategias de crecimiento para cada región, ciudad o territorio:

en resumen, lo que cada vez más se denomina el 'capital territorial' y su explotación eficiente. En este artículo analizamos en profundidad el concepto de capital territorial y resaltamos desde un punto de vista conceptual todos los elementos que están implícitos en este concepto. La novedad del ejercicio empírico radica en el tratamiento simultáneo del todo el territorio europeo.

Competitividad y crecimiento regional Capital territorial

JEL classifications: R1, R5, R11, R58

INTRODUCTION

Global competition is today a reality, with emerging countries invading the European markets with low price products putting the competitiveness of European economies under severe strain. The outcome of this aggressive competition for the European territories is still unclear. Growth opportunities and threats are produced for European regions, but the way in which these opportunities will be grasped – and/or the threats overcome – has not yet been identified. What is clear is that global competition will generate winners and losers among European regions, and it is increasingly important to highlight the strategic elements that will allow regions to join the winning group.

In order to cope with increased competition, and with the consequent increasing level of dynamic uncertainty (about markets, technologies, successful organizational models), firms increasingly rely on high-quality human factors, accessibility to information, devices or 'operators' allowing fast information assessment and transcoding, and forms of coordination and cooperation. As a consequence, directly or indirectly, through explicit locational decisions or the selective effects of competition, they favour and support those territories that supply these new 'relational' factors. Territories, understood as collective actors, may help firms to be competitive, enhancing the presence of these new strategic production factors, and bringing benefits to their 'stakeholders' (local populations). In this sense, it can be said that they compete with each other, no other automatic device being of an extent such to assure long-term development and well-being.¹

The issue of the determinants of regional competitiveness is certainly not a new one. During the fifty years of its existence, Regional Economics has looked carefully for models and theoretical approaches able to highlight the strategic elements of regional competitiveness. Demand-driven models were the first approaches suggested in the literature, arguing that regional growth (and regional competitiveness) depends closely on demand growth, given an appropriate sectoral structure of regional economies (NORTH, 1955; MYRDAL, 1957; KALDOR, 1970).

In the long term, theoretical supply-oriented approaches have outperformed strictly demand-oriented ones (of a Keynesian nature) in the interpretation of regional development processes. In fact, on the one

hand, given the huge interregional integration and ever-increasing international division of labour, regional internal demand is not the main element, even in the short run, to determine regional growth. On the other hand, national demand growth is certainly more important in driving internal regional performances, but it does so on a 'on-average' base: single regions may outperform (or underperform) the national average at the expense (in favour of) other regions² thanks either to a more appropriate (poorer) sectoral mix or to a favourable (unfavourable) competitive differential.

Finally, international demand growth, in particular concerning specific productions, may be highly favourable to the development of specific regions specialized in these production sectors. But this relationship may probably work well in a first approximation and in the short run; in a more precise and longer-term perspective, there is no necessary reason why different regions could benefit to an equal extent from the (aggregate or sectoral) expansion of international trade, be it fast or slow. Textiles, shipbuilding or car production were for long considered slow-growing industries, but this did not prevent the emergence of regional/national success stories such as, respectively, Tuscany (Italy), South Korea or Japan, areas that proved able to acquire fast-increasing shares of an even stagnant international market (ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD), 2007).

From an *ex-ante* and logical point of view, it is exactly this regional differential growth capability that has to be interpreted, and possibly forecasted, on the basis of supply-side elements. Integrated demand–supply approaches, based on complex feedback effects between demand-driven hints and increasing returns effects, have for long shown a good explanatory capacity. This is especially true when strong cumulative effects, either virtuous or vicious, have been widely apparent, pervasively affecting broad typologies of winner and loser regions.

Today, a more selective pattern of regional growth is emerging to differentiate the development paths of single regions and determine a varied mosaic of development stories (DUNFORD and SMITH, 2000; GUERRIERI and IAMMARINO, 2006). This fact calls for more stringent and selective interpretations of the different regional development paths. Perhaps, scholars themselves are becoming more demanding in terms of the accurate interpretation of region-specific growth paths,

and more sensitive to the consequent need to build growth strategies tailor-made for each territory.

The paper consists in a first attempt to measure the relevance of some territorial capital assets to regional competitiveness. In particular, the aim is threefold. First, the purpose of the paper is to emphasize the need to strengthen regional competitiveness in a globalizing world and the crucial role played by territorial, non-mobile or slowly mobile assets, of both a material and non-material nature, in the interpretation of regional performance (see the second section). Secondly, the paper aims to provide a definition of the concept of 'territorial capital' and a taxonomy of its components, emphasizing the relational and cognitive nature of some of those components and pointing out the theoretical advantages deriving from this new approach to regional performance. The approach, in fact, makes it possible to introduce into more formalized models the conceptual achievements of the most recent tradition of regional growth: that is, the inclusion of many intangible and relational assets linked to social structure, inter-firm networking, creativity, and the presence of agglomerations, suggesting the possibility that these can be treated as capital assets measurable to a certain extent through appropriate proxy variables (see the third section). Thirdly, the aim is to measure the contribution of territorial capital to regional growth by means of a scenario exercise simulating regional growth in 2015 in the European Union through a regional econometric model: the Macroeconomic, Sectoral, Social, Territorial (MASST) model. The novelty of the exercise lies in its treatment of the whole European territory at the same time; this comprehensive analysis makes it possible to show the different degrees to which single elements of the territorial capital play a role in explaining the competitiveness of each European region. The results provide useful indications for European or local policy-makers, once competitiveness policies are devoted to 'tapping the untapped resources' of each region (see the fourth and fifth sections).

GLOBALIZATION AND REGIONAL COMPETITIVENESS: THE ROLE OF TERRITORIAL CAPITAL

Regional competitiveness has been defined in different ways: as an increase in the export base of the region, focusing on export price performance (STORPER, 1997; EUROPEAN COMMISSION, 1999; ROWTHORN, 1999), or as an increase in factor productivity (KRUGMAN, 1998; PORTER and KETELS, 2003). The two definitions seem even contradictory. The former requires 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 increases when the denominator is reduced (due

to a devaluation or a reduction in export prices) and tends to generate growth in exports (in volume) and employment. The latter is based on the opposite relationship – namely an increase of the ratio of export prices on import prices, that is, the *terms-of-trade* – following the basic idea that increasing the efficiency of the export sector means 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 (mainly the case of product innovation). In this case a reduction of export prices, and therefore an increase in (price) competitiveness, paradoxically result in a reduction of welfare (CAMAGNI, 2002).

The paradox is easily explained by the difference in the context conditions implicitly considered in the two approaches, and the consequent social goal assigned to growth. In the first case, a non-full employment condition is implicitly assumed, and growth is assigned the goal of increasing employment, even at the expense of real per-capita income; in the second case, a condition of full employment is assumed, typical of classical economics, and growth is equated to an increase in real per-capita income.

As one of the present authors has argued in another work (CAMAGNI, 2002), 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 operational, is to increase the attractiveness of local products by taking action on innovation, thereby breaking the static context, both conceptual and operative, of price competition. One thus comes up against a concept of *non-price competitiveness*: each region must search for a role in the international division of labour, and for those local assets that guarantee the maintenance of a leading role in the international division of labour over time. External competitiveness allows a region to be more dynamic than other areas in the same national system; it is measurable through the capacity of a region to grow more than its national average, that is, through a differential growth of its gross domestic product in monetary terms.

The importance of local assets in ensuring a region's competitiveness over time is today strengthened by a new crucial theoretical argument (CAMAGNI, 2002; KITSON *et al.*, 2004; MARTIN, 2004; MARTIN and SUNLEY, 2006). In a context of globalization and the creation of wide single-currency areas, regions (and also nations) must concern themselves with the competitiveness of their production fabric because no spontaneous or automatic adjustment mechanism is still at work to counterbalance a lack (or an insufficient growth rate) of productivity. Currency devaluation is no longer viable by definition – in the case of regions – or by international monetary agreements; wage/

price flexibility is not sufficient or rapid enough to restore equilibrium once it has been perturbed, mainly because wages and prices are not determined on a regional base. In terms of the theory of international/interregional trade, regions do not compete with each other on the basis of a 'comparative advantage' Ricardian principle – which guarantees each region a role in the international division of labour³ – but rather on an 'absolute advantage' Smithian principle, similar in nature to PORTER's (1990) concept of 'competitive advantage' (CAMAGNI, 2002). The law of comparative advantage does not hold in the case of confrontation among local economies (inter-regional trade), and consequently the conclusion that each region will always be granted some specialization and role in the interregional division of labour is not valid. A region may well be pushed 'out of business' if the efficiency and competitiveness of all its sectors is lower (or grows less rapidly) than that of other regions, for the following reason: at the inter-regional level the two adjustment mechanisms that in a theoretical setting make it possible to pass from an 'absolute advantage regime' to a 'comparative advantage' one, namely price–wage flexibility and exchange rate movements, either do not work properly or do not even exist. On the contrary, a different, much more effective and punishing mechanism works, namely inter-regional migration of mobile factors, capital and labour.

If this is the case, regional and local governments must commit themselves to the goal of external competitiveness and the attractiveness of external firms. The definition of possible growth strategies for each region, city or territory, must necessarily rely on local assets and potentials and their full – and wise – exploitation: in short, it must rely on what is increasingly called 'territorial capital', which will be presented in the next section.

THE CONCEPT OF TERRITORIAL CAPITAL

Towards a cognitive and relational approach to territorial development

If regional growth (and competitiveness) is interpreted on the basis of a supply-oriented approach centred on territorial assets, does this mean that one is back to traditional, supply-side neo-classical models? In a sense, 'yes', as local competitiveness cannot but be linked to local supply conditions. But these supply conditions must necessarily refer to factors completely different from the traditional ones – namely capital and labour, local resources, perhaps extended to infrastructure endowment. The huge theoretical heritage of the endogenous development literature – industrial districts, *milieux innovateurs*, production clusters – has long since directed regional scholars' attention to intangible, atmosphere-type, local synergy and governance factors, something that in the last decade was

re-interpreted in the form of social capital (PUTNAM, 1993; WESTLUND, 2006), relational capital (CAMAGNI, 1999; CAMAGNI and CAPELLO, 2002) or, in a slightly different context, as knowledge assets (FORAY, 2000; STORPER, 2003; CAMAGNI, 2004).

The shift is not at all a terminological one: a cognitive approach is increasingly taking the place of the traditional functional approach. It shows how cause–effect, deterministic relationships should give way to other kinds of complex, inter-subjective relationships which impinge on the way economic agents perceive economic reality, are receptive to external stimuli, can react creatively, and are able to cooperate and work synergetically. Local competitiveness is interpreted as residing in creativity rather than in the pure presence of skilled labour; in local trust and a sense of belonging rather than in pure availability of capital; in connectivity and relationality more than in pure accessibility; in local identity, beyond local efficiency and quality of life.

The theoretical bases that support the new methodological approach consist in the following:

- The theory of bounded rationality and decision-making under conditions of uncertainty, from the seminal contributions of MALMGREN (1961) and SIMON (1972) to their application to industrial innovation (NELSON and WINTER, 1982; DOSI, 1982).
- The institutional approach to economic theory, based on a 'theory of contracts' emphasizing the importance of rules and behavioural codes, of institutions that 'embed transactions in more protective governance structures' (WILLIAMSON, 2002, p. 439) reduce conflicts, and allow the realization of mutual advantages from exchange.
- The cognitive approach to district economies and synergies encompassing the Italian school (BECATTINI, 1990), the French 'proximity' approach (GILLY and TORRE, 2000), the Groupe de Recherche Européen sur les Milieux Innovateurs (GREMI) approach to local innovative environments (CAMAGNI, 1991; CAMAGNI and MAILLAT, 2006),⁴ and Michael Storper's concept of 'untraded interdependencies' (STORPER, 1995). The GREMI group interprets proximity space or local 'milieu' as an operator which reduces uncertainty through its functions as a socialized transcoder of information, a cooperation-enhancing device and a cognitive substrate – represented mainly by the local labour market – in which processes of collective learning embed themselves (CAMAGNI, 1991; CAPELLO, 2001).

By merging cognitive and relational aspects together, the *milieu* concept makes it possible to pass from a micro-behavioural approach to a meso-institutional one considering crucial learning processes as taking place on a collective basis, deeply rooted in the local public and private governance and cooperation context. Territories, and in particular cities, districts and regions, become collective actors thanks to a web

of shared cognitive and behavioural codes, values and goals.

'Territory' is a better term than (abstract) 'space' or (internally homogeneous) 'region' when the following constituent elements are considered:

- A system of localized externalities, both pecuniary (where their advantages are appropriated through market transactions) and technological (when advantages are exploited by simple proximity to the source).
- A system of localized production activities, traditions, skills and know-how.
- A system of localized proximity relationships which constitutes a 'capital' – of a social psychological and political nature – in that it enhances 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 and define local identities; they acquire an economic value whenever they can either be transformed into marketable products – goods, services and assets – or can boost the internal capacity to exploit local potentials.
- A system of rules and practices defining a local governance model.

All the above elements, of a non-material, cognitive and relational kind – which add to, and do not substitute for, more traditional, material and functional elements – may be encompassed and summarized by a concept that, strangely enough, has only recently made its appearance, and outside a strictly scientific context: the concept of *territorial capital*.⁵ Widely acknowledged in a regional policy context, the concept still lacks a clear theoretical definition. An attempt at such a definition is made in the next section.

Territorial capital: a theoretical taxonomy

The concept of territorial capital was first proposed in a regional policy context by the OECD in *Territorial Outlook* (2001), and it has recently been re-launched by DG Regio of the Commission of the European Union:

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)

Accordingly, the OECD (2001) rightly indicates a long, sometimes plethoric but well-structured list of factors as the determinants of territorial capital, ranging from traditional material assets to more recent non-material ones.

These factors may include the area's geographical location, size, factor of production endowment, climate, traditions, natural resources, quality of life or the agglomeration economies provided by its cities, but may also include [...] business networks that reduce transaction costs. Other factors may be 'untraded interdependencies' such as understandings, customs and informal rules that enable economic actors to work together under conditions of uncertainty [...] and 'something in the air', [...] a combination of institutions, rules, practices [...] that make a certain creativity and innovation possible.

(p. 15)

Given these premises, the concept of territorial capital warrants closer inspection mainly with regard to its components and economic meaning. On the one hand, it is clear that in the preceding list some elements refer to the same abstract factor class and differ only in terms of the theoretical approach of their proponents, while some other elements are lacking. On the other hand, for many of these factors the notion of capital is questionable, as they do not imply an investment (an asset requiring a remuneration) or a production factor expressed in quantitative terms.

In a general but compact definition, territorial capital may be seen as the set of localized assets – natural, human, artificial, organizational, relational and cognitive – that constitute the competitive potential of a given territory. Following one of the present authors (CAMAGNI, 2009), a useful taxonomy of all potential sources of territorial capital, at the same time theoretically sound and relatively exhaustive, may be proposed by building upon two main dimensions:

- The dimension of rivalry:⁶ public goods, private goods, and an intermediate class of club goods and impure public goods.
- The dimension of materiality: tangible goods, intangible goods and an intermediate class of mixed, hard-soft goods.

The three classes pertaining to each dimension can give rise to a 3×3 matrix. The four extreme classes – high and low rivalry, tangible and intangible goods (the grey areas shown in Fig. 1a) – represent by and large traditional classes of sources of territorial capital as usually

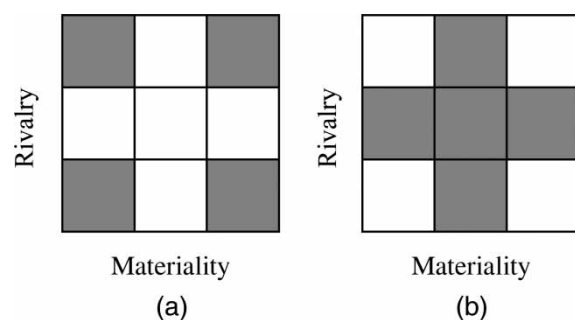


Fig. 1. Traditional and innovative factors of territorial capital: (a) the 'traditional square'; and (b) the 'innovative cross'

cited in regional policy schemes; they can be called the 'traditional square'. On the other hand, the five intermediate classes represent more interesting and innovative elements on which a new attention should be focused; they can be called the 'innovative cross' (the grey areas shown in Fig. 1b).

In fact, with regard to these latter components, one can find, on the materiality axis, mixed goods characterized by an integration of hard and soft elements, material goods and services indicating the capacity to translate virtual and intangible elements into effective action, public/private partnerships, the supply of services, or the capacity to translate geographical and cognitive proximity into effective linkages among economic agents. On the other hand, one can find on the rivalry axis an intermediate class of goods encompassing two different relevant cases:

- Impure public goods, in which excludability is low (as in pure public goods), but rivalry is higher owing, for example, to growing conditions of congestion and scarcity. In this case, rivalry may also take the form of interest conflicts among different types of users or between the class of generic (and respectful) users and some specific free-riders which, with their action, may endanger the consistency of the public territorial goods.
- Club goods, where the opposite condition holds, namely high excludability (with respect to non-members) and low rivalry.⁷

In all these intermediate cases, a crucial control function must be performed by public authorities in order to keep the potential benefit to the local community high and pervasive. Rules, regulations and authorities must be put in place, maintaining a well-balanced position. But also new forms of local governance through agreements, cooperation and private/public synergies could perform well, and even better than traditional 'government' interventions.

The different categories of territorial capital are sketched in Fig. 2, which is constructed on the three classes of the two dimensions of rivalry and materiality, namely:

- a. *Public goods and resources*: traditional social overhead capital and infrastructure, natural and cultural public-owned resources, environmental resources.
- b. *Intermediate, mixed-rivalry tangible goods*: proprietary networks in transport, communication and energy; public goods subject to congestion effects; collective goods made up of a mix of public and private-owned goods like urban and rural landscape or complementary assets defining a cultural heritage system. The first category is generally subject to a control authority guaranteeing fair access, absence of monopoly pricing, sufficient maintenance and innovation on the network/good. The last two categories warrant closer inspection: they mainly comprise public or collective goods subject to congestion or

free-rider effects that call for a mix of control and incentive measures in order to maintain the potential beneficial externalities they may supply.

- c. *Private fixed-capital and toll goods*: the private fixed-capital stock is of course a traditional component of territorial capital that, in a long-term perspective, may be volatile and mobile. But it could be anchored to the local realm thanks to the presence of softer but characteristically local and less mobile factors like skills, entrepreneurship and knowledge. Also placed in the same class are pecuniary externalities, of a hard nature, and public but tolled goods, in particular in cases where the tolls cover construction and maintenance costs.
- d. *Social capital*: this concept (COLEMAN, 1990; PUTNAM, 1993; GROOTAERT and VAN BASTELAER, 2001) may be considered by now sufficiently established. It can be defined as the set of norms and values which govern interactions among people, the institutions where they are incorporated, and the overall cohesion of society. In short, social capital is the 'glue' holding societies together.
- e. *Relational capital*: while it could be argued that social capital exists wherever a society exists, 'relational' capital may be interpreted as the set of bilateral/multilateral linkages that local actors have developed, both inside and outside the local territory, facilitated by an atmosphere of easy interaction, trust, shared behavioural models and values. In this sense, relational capital may be equated to the concept of local *milieu* understood as a set of proximity relations which bring together and integrate a local production system, a system of actors and representations and an industrial culture, and which generates a localized dynamic process of collective learning (CAMAGNI, 1991).⁸
- f. *Human capital*: the presence of this element is constantly mentioned as a fundamental capital asset available to territories in order for them to compete in the international arena. Endogenous growth theories have long since developed the concept into formalized growth models (LUCAS, 1988; ROMER, 1990) starting an important and fruitful convergence trend between stylized approaches and qualitative, bottom-up development theories (CAPELLO, 2007a).
- g. *Agglomeration economies, connectivity and receptivity*. Agglomeration economies characterize two territorial archetypes that, in spite of their geographical and economic differences, present clear similarities in theoretical terms (reduction of uncertainty and transaction costs for economic actors (CAMAGNI, 2004). By 'connectivity' is meant the condition in which pure physical accessibility is utilized in a targeted and purposeful way. 'Receptivity' is the capacity to extract the highest benefit from access to places, services or information.
- h. *Cooperation networks*. This category of territorial capital lies at the centre of the 'innovative cross'. It integrates tangible and intangible assets and realizing goods and services traditionally supplied through

Rivalry	High rivalry (private goods)	<u>Private fixed-capital stock</u> <u>Pecuniary externalities (hard)</u> <u>Toll goods (excludability)</u> <i>c</i>	<u>Relational private services operating on:</u> - external linkages for firms - transfer of R&D results <u>University spin-offs</u> <i>i</i>	<u>Human capital:</u> - entrepreneurship - creativity - private know-how <u>Pecuniary externalities (soft)</u> <i>f</i>
	(club goods) (impure public goods)	<u>Proprietary networks</u> <u>Collective goods:</u> - landscape - cultural heritage (private 'ensembles') <i>b</i>	<u>Cooperation networks:</u> - strategic alliances in R&D and knowledge - public/private partnerships in services and schemes <u>Governance on land and cultural resources</u> <i>h</i>	<u>Relational capital (associationism):</u> - cooperation capability - collective action capability - collective competencies <i>e</i>
	(public goods) Low rivalry	<u>Resources:</u> - natural - cultural (punctual) <u>Social overhead capital:</u> - infrastructure <i>a</i>	<u>Agglomeration and district economies</u> <u>Receptivity-enhancing tools</u> <u>Connectivity agencies for R&D transcoding</u> <i>g</i>	<u>Social capital (civiness):</u> - institutions - behavioural models, values - trust, reputation <i>d</i>
		Tangible goods (hard)	Mixed goods (hard plus soft)	Intangible goods (soft)
Materiality				

Fig. 2. *A theoretical taxonomy of the components of territorial capital*
Note: R&D, research and development. Source: CAMAGNI (2009)

public/private or private/private cooperation networks. Strategic alliances in research and development (R&D) and knowledge creation supported by public agencies for the dissemination and diffusion of knowledge are the key tools with which to achieve a fair and rapid implementation of the knowledge society. A second field in which cooperation networks manifest themselves is represented by new forms of governance in the field of spatial planning and land use; a field characterized by both market failures and government failures (OECD, 2001).

- i. *Relational private services:* in the field of marketing, search for external partners and suppliers, technological transfer and diffusion.

The preceding taxonomy furnishes a consistent and fairly complete overview on the possible manifestations of territorial capital. All the individual types mentioned here have already been considered in some way by various branches of the economic literature, but never with the aim of providing a comprehensive frame for the interpretation of regional development and innovation factors. The present approach makes it possible to pinpoint the different roles and potential cross-relationships among the different types. In fact, it simultaneously considers the elements that were indicated as 'preconditions' for growth, namely public goods like social overhead

capital, infrastructure and accessibility (ROSENSTEIN-RODAN, 1943; ROSTOW, 1970); those that were termed the actors or the 'driving forces' of growth, namely human capital, entrepreneurship, small and medium-sized enterprises, past accumulation of physical capital; and those labelled as social 'filters' (ACS *et al.*, 2005; ACS and PLUMMER, 2005; RODRIGUEZ-POSE, 1999) acting as enhancers of the productivity and effectiveness of previous, more traditional factors. An approach to regional performance and competitiveness in terms of territorial capital may be conceived as an initial attempt to link stylized regional growth theories, on the one hand – both supply-side, neoclassical theories (BORTS and STEIN, 1964; LUCAS, 1988; ROMER, 1990) and demand-supply cumulative theories (KALDOR, 1970) – and mainly qualitative theoretical constructions on regional development, on the other hand (ROSENSTEIN-RODAN, 1943; MYRDAL, 1957; BECATTINI, 1990; CAMAGNI, 1991; CAMAGNI and MAILLAT, 2006). This is explained in the next section.

The theoretical advantage of a territorial capital approach to regional performance and competitiveness

The logical scheme with which to interpret the role of territorial capital in regional competitiveness theoretically may be thought of as a new form of the production

function approach with heterogeneous capital assets. This approach was opened many years ago by the 'quasi-production function' concept including infrastructure assets (BIEHL, 1986, NIJKAMP, 2011), and then implemented with other stock variables like public services infrastructure (ASCHAUER, 1989), energy and telecommunications infrastructure (STERN, 1993; CAPELLO, 1994). Multiple advantages derive from this approach, namely:

- The possibility to deal with the criticisms concerning the aggregate production function approach that emerged from the 'controversy between the two Cambridges' of the 1960s,⁹ because the heterogeneity of capital assets allows their definition and measurement in physical terms (HARCOURT, 1969).
- The possibility to inspect and interpret in theoretical terms at least some parts of Solow's technical progress residual, shedding light on the hypothesized role of territorial context conditions in a cross-sectional regression analysis as determinants of the regional competitiveness of different regions (SOLOW, 1957). These specific context conditions in fact enhance the productivity of traditional factors, like labour, shifting their marginal productivity curve upward.
- The possibility to introduce into formal models the determinants of regional competitiveness indicated by the recent literature in abstract terms but almost never included in stylized econometric models. These determinants are often indicated as the presence of decision centres, environment, regional culture, regional accessibility, skills, institutions and social capital (GARDINER *et al.*, 2004; MARTIN, 2004), which appear largely similar to the those that were included, in a more structured and consistent way, in the above taxonomy (Fig. 2).
- The possibility to translate the conceptual regional growth model, based on territorial capital assets, into a sound econometric model able at the same time to indicate, in given space-time conditions, the relative importance of each capital asset and the effect of mutual interaction among different assets.
- This last element seems particularly important as far as the link between tangible and intangible, mainly cognitive, assets is concerned: the role of the latter assets, in fact, is expected to reside in enhancement of the efficiency of material assets. A recent empirical work has shown that collective learning, mutual understanding, reciprocal trust and social commitment play a major role in determining economic performance by magnifying the effects of formal knowledge creation (R&D) on regional growth (CAPELLO *et al.*, 2011).

An interesting research question with important policy implications is the efficiency with which the different territorial capital elements act on regional competitiveness. Do all kinds of territorial capital assets play a role in defining regional competitiveness? Does regional heterogeneity exist in exploiting territorial capital assets?

The importance of non-material factors as determinants of local competitiveness per se and as multipliers of the efficiency of material factors point to the conclusion that the local opportunities for growth are far from being evenly distributed at the territorial level; they are deeply rooted in the history of the local society, and in its endogenous capabilities. For this reason, growth opportunities are difficult to replicate elsewhere, and they require *ad hoc* policy interventions.

The replies to the previous questions depend on the availability of appropriate information on stocks of the different forms of territorial capital. This availability is by and large satisfactory at the level of single countries, but not at an international level. Some initial results have been achieved by a European Observation Network for Territorial Development and Cohesion (ESPON) project on regional development scenarios for the Latin Arc (Spain, France, Italy), particularly with reference to two categories of territorial capital: settlement structure (including agglomeration economies and different urban structures) and some non-material assets like social capital (electoral turnout rate) (CAMAGNI and CAPELLO, 2011). At the European level, a first attempt to answer the previous questions is presented in what follows.

TERRITORIAL CAPITAL AND REGIONAL GROWTH: AN EMPIRICAL ANALYSIS

Data and methodology

The aim of this section is to provide some initial empirical evidence on the role played by territorial capital factors in the development of European regions (NUTS-2¹⁰). The purpose of this empirical analysis is not to test the importance of all elements cited in the taxonomy, but rather to demonstrate the variety of effects exerted by some territorial elements at regional level.

The choice among all possible territorial capital elements has settled on only four of them:

- Entrepreneurship, proxied by the share of self-employment on total employment.
- Creativity, measured as the share of science and technology employment on total employment.
- Social overhead capital, partially captured by the density of transport infrastructure.
- Receptivity, measured by that part of regional growth dependent on the other regions' dynamics, as follows:

$$SP_r = \sum_{j=1}^n \frac{\Delta Y_{jt}}{d_{rj}} \quad (1)$$

where ΔY_{jt} is income growth; j is all neighbouring regions of region r ; d_{rj} is physical distance between

region r and j ; and n is the number of neighbouring regions.

As already stated, the nature of the four elements makes it possible to cover all different classes of the territorial capital elements: one element is part of the 'innovative cross' and some are part of the 'traditional square'; two elements are private and two are public; lastly, some are intangible and some are tangible. They represent broad heterogeneity in the relational capital and therefore stress its regional uniqueness. In this sense, the empirical analysis is therefore able to capture the role of all the kinds of elements that are conceptually of interest.

The Macroeconomic, Sectoral, Social, Territorial (MASST) model – which was built by the authors – estimates regional growth as the sum of a national growth component and a differential regional growth component.¹¹

$$\Delta Y_r = \Delta Y_N + s; \quad r \in N \quad (2)$$

where ΔY_r and ΔY_N denote the gross domestic product growth rate, respectively, of the region and the nation; and s represents the regional differential growth with respect to the nation.

In this respect, MASST differs substantially from existing regional growth econometric models in which a direct interpretation of absolute regional growth is made either by replicating national macroeconomic models or through complex systems of equations for each region linked to both the national aggregate economy and the other regional economies through input–output technical coefficients.¹²

Fig. 3 presents the logic of the model. It consists of two intertwined sets of equations: a national set (sub-model 1 in Fig. 3) – sensitive to aggregate, mainly national and international components referring both to the supply side (productivity, exchange rates) and the demand side (exports, international and national investments, consumption, public expenditure), all presented in the macroeconomic elements of Fig. 3, column on the left – and a regional one, interpreting the differential performance of each region vis-à-vis the respective country (sub-model 2 in Fig. 3). The national sub-model captures the effects of elements of price competitiveness (exchange rates, efficiency wages); the regional sub-model captures, on the other hand, the effects of elements generating non-price competitiveness, measured through the ability of a region to be more dynamic than other areas in the same national system.¹³ Similarly to the pioneering Solow approach, regional growth depends on both traditional production factor endowment (labour, capital, transport infrastructure and energy resource) and on softer 'technical progress' factors (effectiveness of the urban structure, creativity, entrepreneurship, receptivity) generating a quantum jump in traditional factor productivity, and hence boosting the overall competitiveness of the region.

The regional differential growth component (s_r) is made dependent on the presence of territorial capital (Fig. 3, sub-model 2 on the right):

$$s_r = f(\text{elements of territorial capital}) \quad (3)$$

The methodology applied in order to identify the role of the four single components of territorial capital, and of all of them together, on regional growth relies on a simulation exercise run with the MASST model. The scenario utilized in this case is a baseline scenario assuming that the present socio-economic tendencies at work will last for the next decade and a half, and that no drastic changes in macroeconomic and structural policies will intervene to give rise to new dynamic paths of the variables. The scenario results are compared with a second-run simulation procedure where, in turn, the foreseen increase in each territorial capital component in each region is set to zero. The difference between the regional growth values obtained by the two simulations provides an indication of the contribution of territorial capital to regional growth.¹⁴

The model is estimated on all 259 NUTS-2 regions of the twenty-seven European member countries. All equations have been tested for spatial dependence using the spatial regression and testing modules in STATA, and a distance matrix consisting of the distances in kilometres between all couples of regions in the sample.¹⁵

THE CONTRIBUTION OF TERRITORIAL CAPITAL TO REGIONAL GROWTH: EVIDENCE FROM THE MASST MODEL

The present section sets out the results of the simulation runs with the MASST model, assuming, for each component of territorial capital in turn, a zero increase in its endowment in the single regions. The maps shown in this section therefore provide an indication on the contribution of each territorial capital element to regional growth.

Fig. 4 presents the contribution to regional growth of each of the four territorial capital factors taken into consideration in the analysis. The first important result is that each component produces a rather different picture. Fig. 4(a) shows the contribution of *transport infrastructure* to regional growth, that is, how much regions grow due to the presence of transport infrastructure. Peripheral areas in Northern Europe (the Scandinavian countries and Scotland) together with most areas in Eastern countries register the highest growth from transport infrastructure increase, a result that can be explained by the importance of these infrastructure in overcoming remoteness in these regions. However, also central regions in the Pentagon, some advanced regions in Northern Italy, and some agglomerated areas like

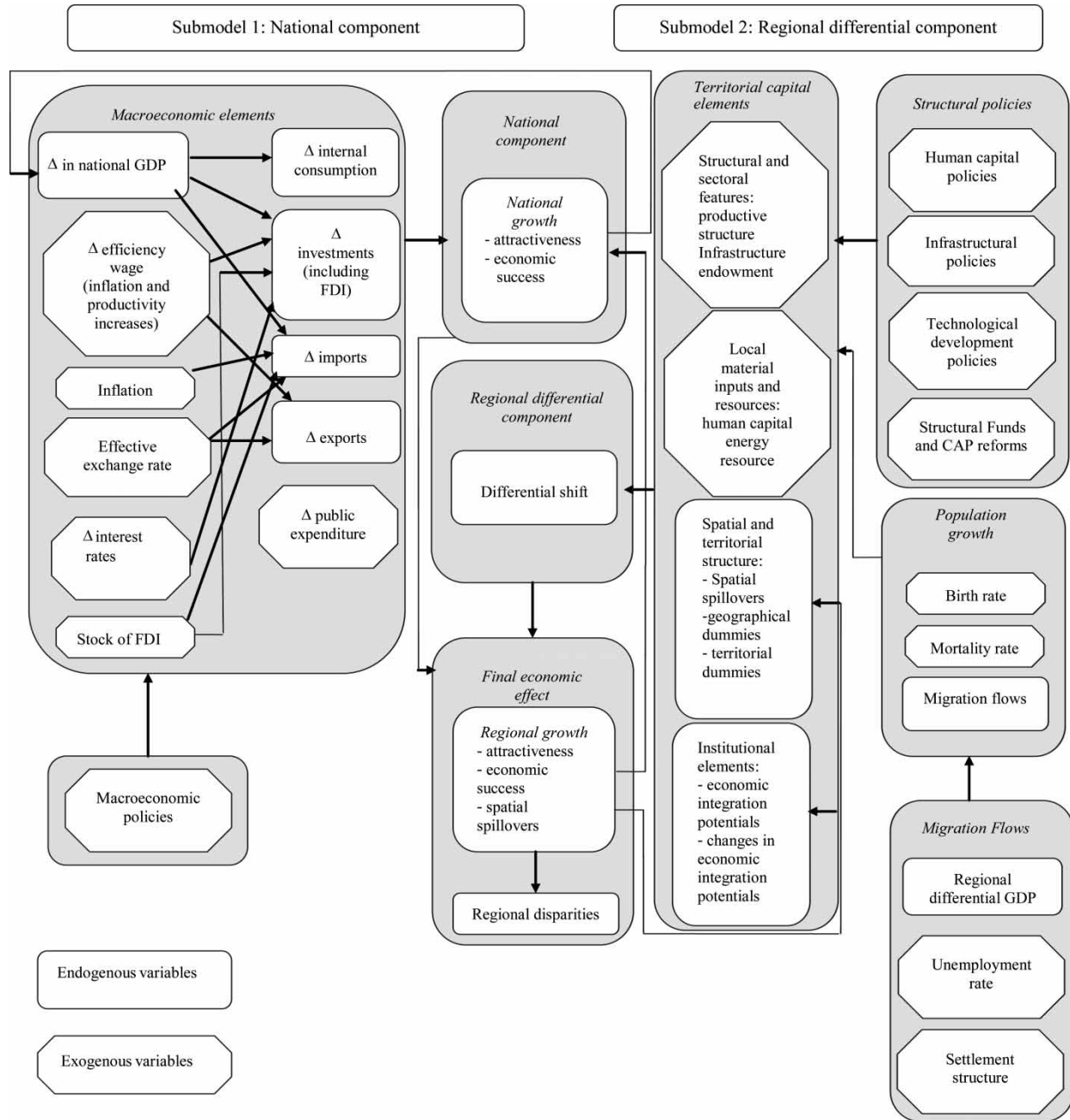


Fig. 3. Macroeconomic, Sectoral, Social, Territorial (MASST) model specification

Note: CAP, Common Agricultural Policy; FDI, foreign direct investment; GDP, gross domestic product.

Source: CAPELLO (2007b)

Barcelona and Madrid in Spain, and Porto and Lisbon in Portugal, perform relatively well thanks to the infrastructure increase. An explanation of this result might be that a higher endowment of transport infrastructure makes it possible to overcome congestion effects.

A different picture is presented by Fig. 4(b), where the increase of *receptivity capacity* (that is, that part of regional growth which is dependent on the performance of neighbouring regions, like sorts of growth spillovers) on regional growth is highlighted. The map shows the extent to which regional growth is due to the capacity of a region to exploit the increasing

growth of neighbouring regions. This is typical of central 'pentagon' Europe, of major capitals, and 'mega' regions (London, Paris, Milan, Munich, Brussels, etc.); but, interestingly, it is also scattered towards more peripheral territories.

Fig. 4(c) shows the part of regional growth which is due to an increase in *entrepreneurship*. It evidences that the effect of an increase in entrepreneurship on Eastern regions' growth is rather limited, and that it is instead more important in peripheral countries of the old fifteen member states like Italy, Spain and Greece. A relatively important role is also played by an increase in

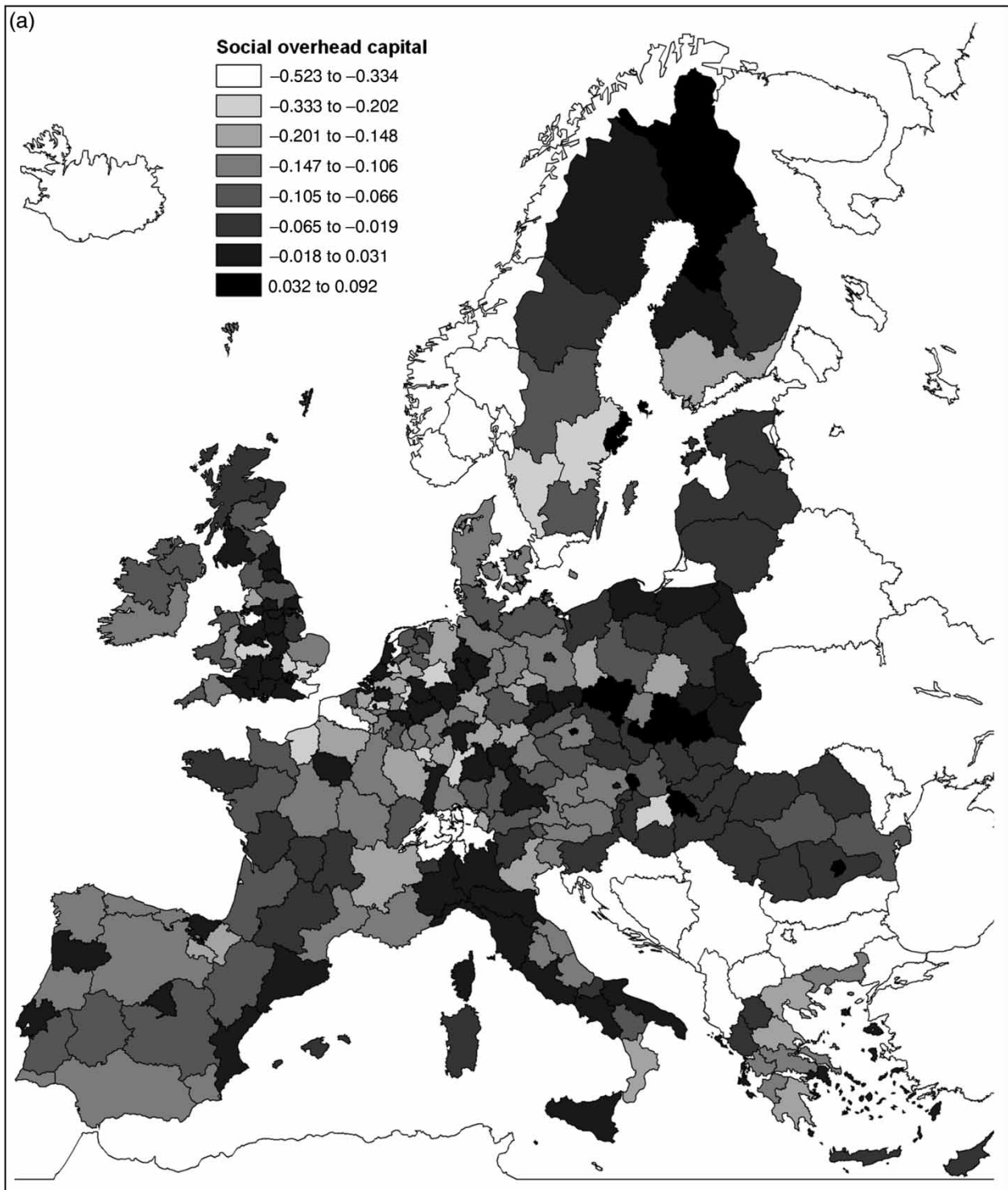
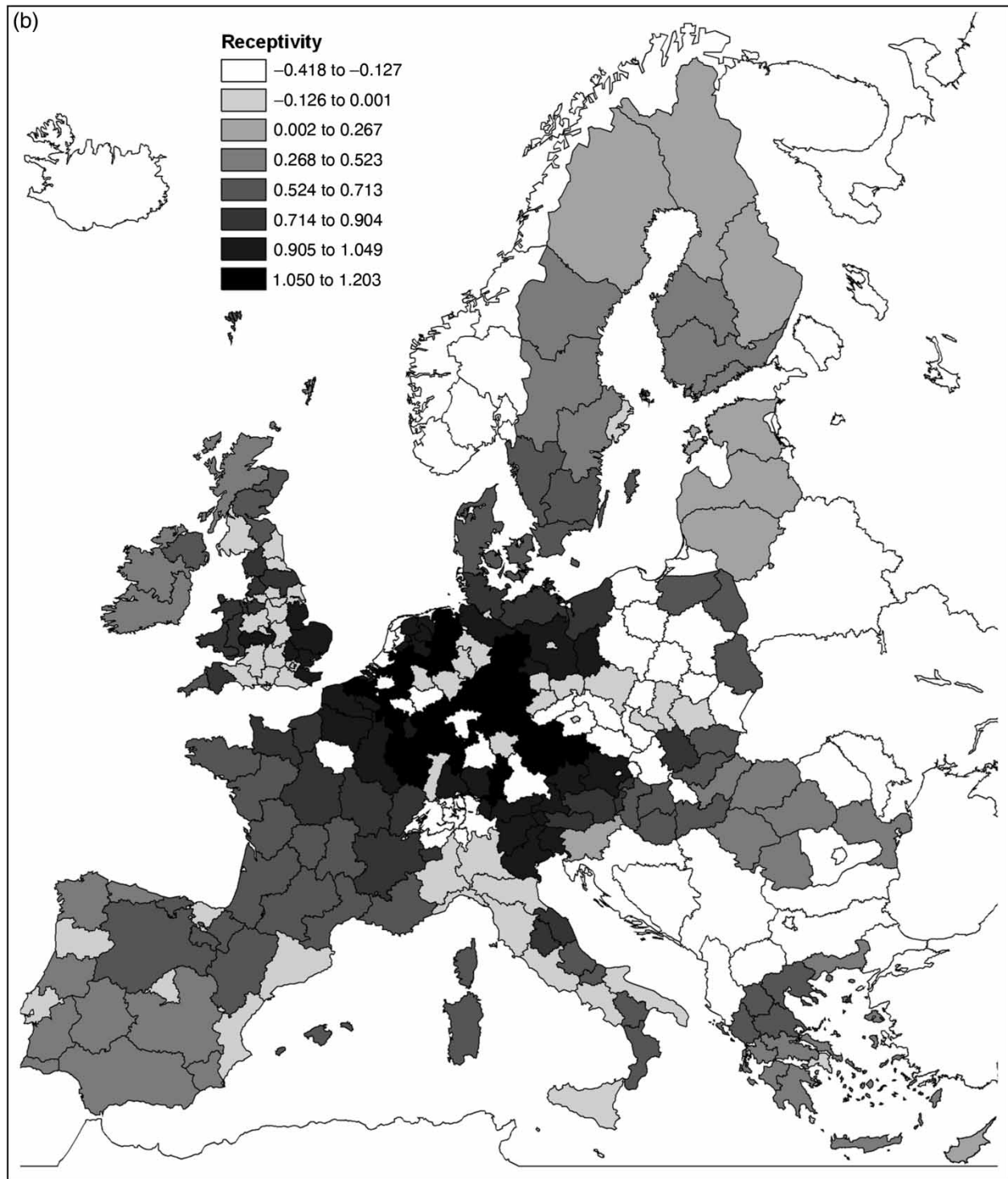


Fig. 4. Contribution of territorial capital elements to regional growth: (a) transport infrastructure, (b) receptivity, (c) entrepreneurship, (d) creativity and (e) total effect

entrepreneurship in some regions of the 'Pentagon' area (London–Paris–Milan–Munich–Hamburg). As expected, an increase in entrepreneurship has a limited role in capital regions' growth, probably because the latter are more influenced by the presence of value added functions not represented by a variable of self-employment.

Interestingly, Fig. 4(d) presents a rather unexpected result as regards the contribution of an increase in *creativity* to regional growth: an increase in creativity explains a larger part of regional growth in Eastern regions, where R&D and scientific activities are not expected to play an important role in the future, while in the old

Fig. 4. *Continued*

fifteen member states, the highest values are registered in some regions of the Pentagon.

If all effects are counted together, the outcome is the one presented in Fig. 4(e). An increase in some elements of the territorial capital makes an important contribution to regional growth in most Pentagon regions, in some peripheral areas like Greece and part of Spain, and France. It is evidently lacking in Eastern countries, in peripheral countries in the North (Scandinavian

countries, the UK and Italy). Interestingly, capital regions, like Madrid, Lisbon, Paris, Athens, London, Copenhagen, Oslo and Helsinki, and important agglomerated regions like the regions in Northern Italy, Barcelona and Côte d'Azur, receive a small contribution from territorial capital increase to regional growth. This suggests that, like all productive factors, also territorial capital shows decreasing marginal productivity.

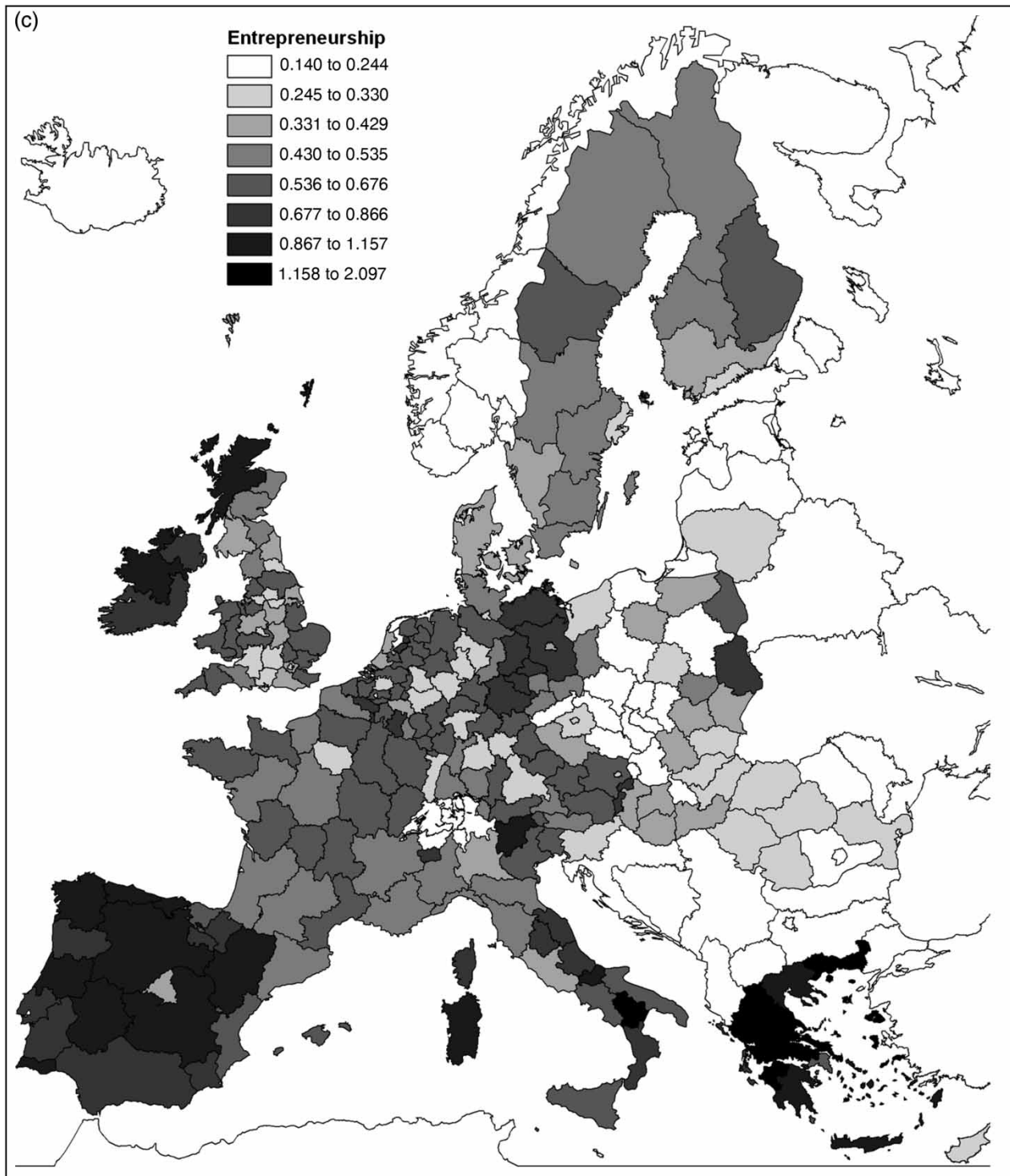


Fig. 4. Continued

This first empirical result testifies to the differing importance of each element of territorial capital for growth in different regions. Greater effort in terms of data collection should be made in order to test other elements of territorial capital, especially the soft ones. Preliminary attempts have been made in this respect (CAPELLO *et al.*, 2011; CARAGLIU, 2009; CARAGLIU and NIJKAMP, 2012).

BEHAVIOURAL PATTERNS IN TERRITORIAL CAPITAL'S CONTRIBUTION TO REGIONAL GROWTH

The previous results testify to a wide variety of behavioural patterns in how an increase in territorial capital explains part of regional growth. This certainly depends on the expected increase in territorial capital

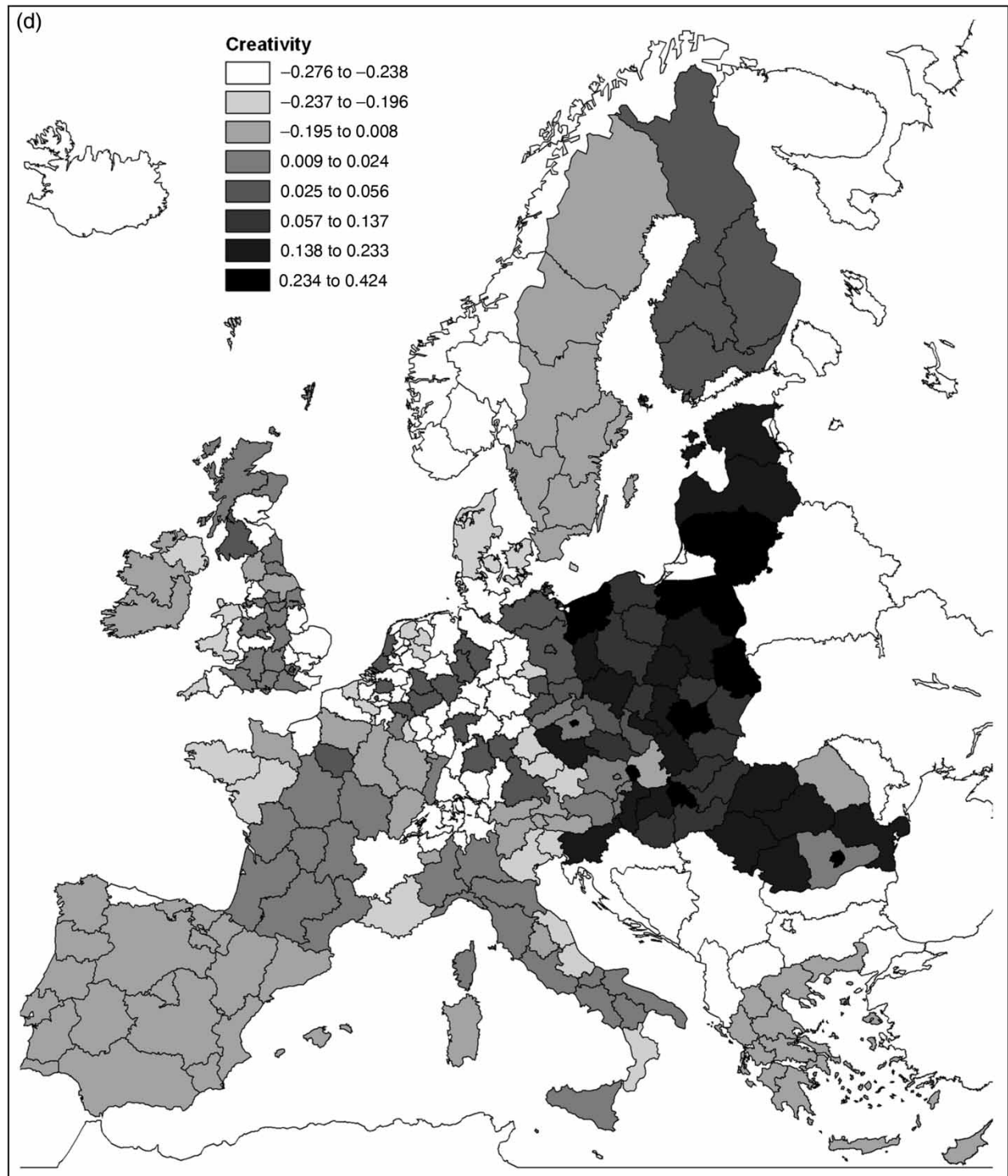


Fig. 4. Continued

elements that characterizes each region. However, one expects to find that the ability of a region to exploit its territorial capital changes according to other structural characteristics, like a region's degree of agglomeration, as well as to institutional (national/supranational) characteristics.

In order to highlight common behavioural patterns in territorial capital's contribution to regional growth

among regions, a descriptive analysis was run. Table 1 provides the aggregate (weighted) average of the effects of an increase of each territorial capital element to regional growth according to the territorial settlement structures of regions and their relative location. The territorial settlement structure divides regions into agglomerated, urban and rural regions, according to the density and number of cities.¹⁶

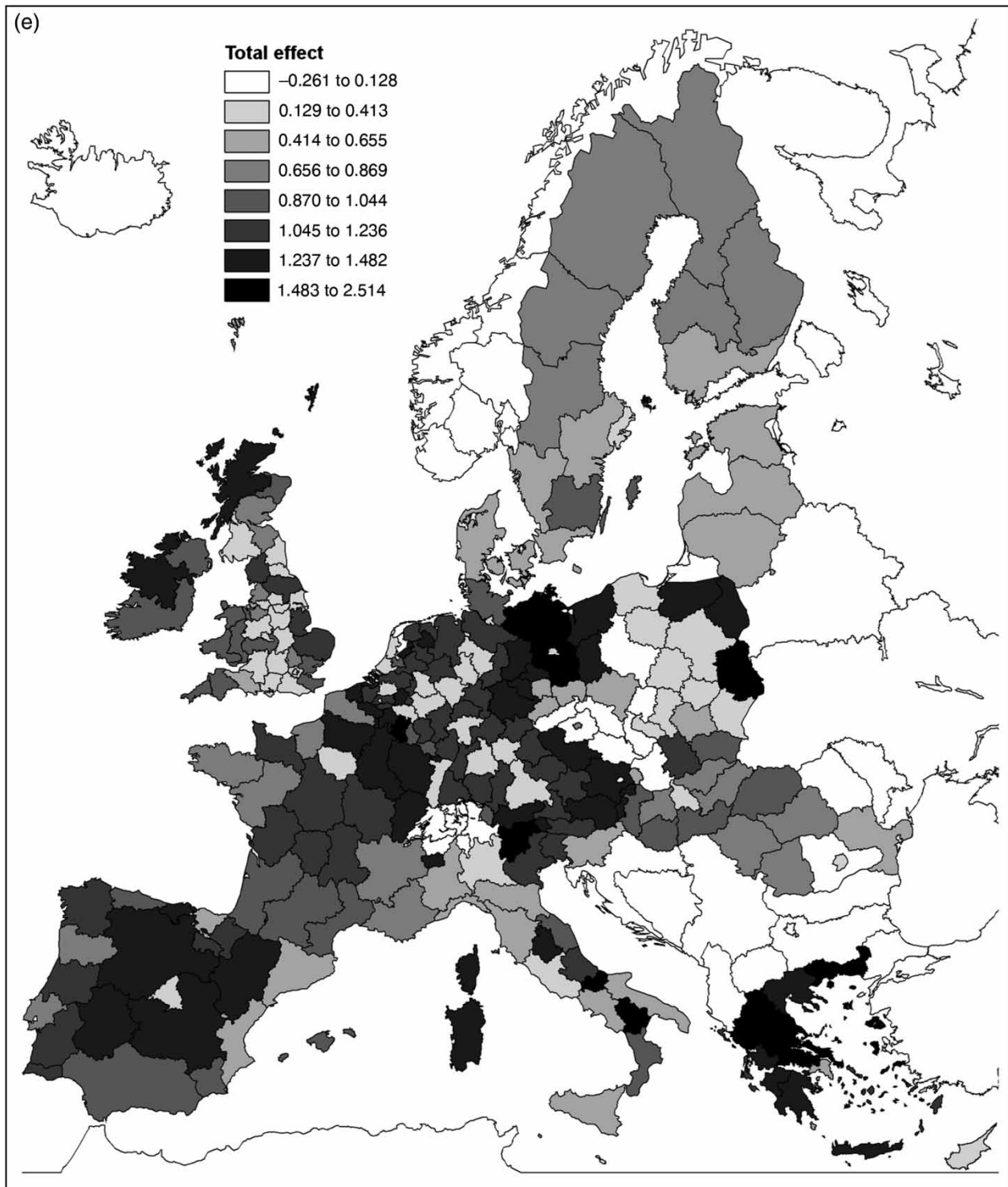


Fig. 4. Continued

If one looks at the difference between Eastern and Western countries, the results show that the two blocks of countries behave in a completely different way: as already shown in the maps, Eastern regions gain relatively higher advantage for their growth from creativity and transport infrastructure; Western regions, by contrast, are much more sensitive to entrepreneurship and receptivity (Table 1).

The situation is rather different also when the four different factors of territorial capital are analysed separately in the two blocks of countries. In Eastern countries, an increase in transport infrastructure contributes more to regional growth in urban and metropolitan European growth areas (MEGAs), testifying to the importance of overcoming remoteness for regional growth in those countries. In Western countries, the

Table 1. Contribution of territorial capital to regional growth by types of regions and countries

Settlement structure of regions	Components of territorial capital				
	Total	Transport infrastructure	Entrepreneurship	Creativity	Receptivity
<i>All countries</i>					
East	+	++	+	++	+
West	++	+	++	+	++
<i>Eastern countries</i>					
MEGAs	+++	+	++++	++	++++
Agglomerated	++	++	+++	+++	++
Urban	++++	++++	++	++++	+++
Rural	+	+++	+	+	+
<i>Western countries</i>					
MEGAs	+++	++	++++	+++	++
Agglomerated	+	++++	+	++++	+
Urban	++	+	++	++	+++
Rural	++++	+++	+++	+	++++

Notes: The table contains, for each territorial capital component, the ranking of the weighted average regional growth rates of each geographical area. A '+' is the lowest weighted average regional growth rate; and '++++' is the highest. Given the existence of only two geographical areas, in the case of East and West the highest is '++'.

MEGAs, Metropolitan European growth areas.

advantage of an increase in infrastructure to growth stems from the overcoming of congestion effects. An increase in entrepreneurship is relatively more important for growth in MEGAs, agglomerated and urban regions in Eastern countries, where the development of service activity still plays a role. In Western countries, an increase in entrepreneurship plays a role in both mega- and rural areas, showing a relatively mixed pattern. In both Western and Eastern regions, an increase in creativity is more important for agglomerated and mega-regions, while it is relatively less important for rural areas, as to be expected. Finally, an increase in receptivity yields an interesting and clear result: in Western countries a relatively diffused growth pattern is taking place, while in Eastern countries growth is heavily concentrated.

CONCLUSIONS

Territorial capital appears to be a useful concept. It encompasses a wide variety of territorial assets, both tangible and intangible, of a private, public or mixed nature. These assets may be physically produced (public and private goods), supplied by history, or derive from natural endowment (cultural and natural resources, both implying maintenance and control costs). They can be intentionally produced in spite of their non-material nature (coordination or governance networks) or unintentionally produced by social interaction aimed at goals wider than direct production purposes. In all cases, a repeated use in successive production cycles of these assets is implied, and the usual accumulation-depreciation processes take place, as in the case of physical capital assets. In most cases, the accumulation process is costly, except for cases

where socialized processes occurring within the territorial context are responsible for the cumulative creation and value of a non-material asset.¹⁷

The economic role of territorial capital resides in the enhancing efficiency and productivity of local activities. In a stylized, potential treatment of the single elements of territorial capital, efforts should be directed towards the possibility of a quantitative measurement of each of them. The impossibility of a direct measure entails equating the effects of territorial capital with 'technological progress' in a production function – but this would only represent a measure of one's 'ignorance'.

This paper has proposed a tentative theoretical taxonomy of the different components of territorial capital based on the two dimensions of rivalry and materiality and going beyond the traditional 'square' encompassing pure private and pure public goods, human capital, and social capital. An intermediate class of club goods or impure public goods emerges, implying or requiring a strong relational nature, and which appears to be of great importance in terms of the governance of local development processes. Generally, tangible assets are subject to traditional supply processes, while intangible assets operate in the sphere of 'potentials'. The 'mixed' category merging the two components translates abstract potentials into actual assets, defining shared action strategies, complex relational services, and concrete cooperation agreements between private and public partners.

The 'mixed' category of hard plus soft goods has the further advantage of pointing up the importance of such complex territorial organizations as cities or 'districts'. These are sorts of collective goods built through the spontaneous unorganized action of a multitude of local actors, private and public, thus generating wide

externalities to the entire community. Once again, strategic control policies should be adopted in order to avert the risks implicit in rent-seeking behaviour: the localized nature of these public goods automatically generates increases in land rents, which, on the one hand, may be beneficial in that they trigger a continuous upward selection process in the quality of local activities and a 'filtering down' process of lower-order functions along the urban hierarchy, but, on the other hand, subtract parts of the potential profits from productive (social classes and) uses.

The paper has proposed an empirical analysis with the aim of describing the effects of an increase in territorial capital endowment on regional growth on the basis of four territorial capital elements: entrepreneurship, receptivity, creativity and transport infrastructure. These represent large heterogeneity in the territorial capital-relation and therefore stress the regional uniqueness of the relation. The empirical analysis has clearly shown that those regions registering an increase in territorial capital assets register a higher performance. Moreover, it has demonstrated that territorial capital, like all production factors, is subject to strong decreasing returns to scale: in fact, in those regions (agglomerated and mega-regions) in which the level of territorial capital is higher, the effect of its increase on regional growth is more contained. A last interesting aspect emerges: the different factors of territorial capital analysed (receptivity, transport infrastructure, entrepreneurship and creativity) play different roles in local growth according to the settlement structure and relative location of regions.

The conceptual and empirical analysis has important implications for new spatial development policies (OECD, 2001; CAMAGNI, 2001) in line with the smart specialization policies (FORAY, 2009) called for by the European Union in its official document entitled *Regional Policy Contributing to Smart Growth in Europe* (EUROPEAN COMMISSION, 2010), and it recommends new governance styles addressed to cooperation and relationality. A telling example of the new governance style required is provided by the new strategies necessary to cope with the knowledge society issue: instead of (or beyond) injecting further public money directly into the system of firms, universities and research centres, which by and large are self-referential systems addressed to their specific goals, public policy should support 'relational' actions like common schemes and production projects built in cooperation between the above-mentioned actors operating on the local or regional scale, or 'transcoding' services linking scientific output and business needs or ideas – transfer of R&D, development of a science-based entrepreneurship, university spin-offs. More generally, the approach suggests a new role for local or regional policy-makers: that of 'facilitators' of linkages and cooperation among actors, at both the regional and the inter-regional/international scales.

It is the authors' opinion that territorial capital is a powerful concept for European Union policy purposes: as empirically shown in this paper, each region has a particular capacity to take advantage of specific territorial capital assets. This calls for individual development strategies for each region which seek to make the most of its assets and to develop new ones to attract new activities, as advocated by the new cohesion policy reform (BARCA, 2009).

NOTES

1. It has been underlined that economists and experts everywhere have elevated 'competitiveness' to the status of a natural law of the modern capitalist economy (KITSON *et al.*, 2005, p. 1).
2. Note that on an *ex-post* base, the national aggregate growth rate and the weighted sum of regional growth rates are equal.
3. Each country always has a 'comparative advantage' in some production sectors, even if it is less efficient in absolute terms in all productions with respect to competitor countries. Its advantage resides in those productions in which it is 'comparatively' less inefficient, and it is exactly in these productions that it will specialize within the international division of labour, with mutual benefits to all countries. The Ricardian principle of comparative advantage was judged by Paul Samuelson as the only statement of economic theory at the same time true and not trivial. As it is argued here, it refers to countries, not to regions or territories (also CAMAGNI, 2001).
4. GREMI (Groupe de Recherche Européen sur les Milieux Innovateurs), whose central seat is at the Université de Paris 1 – Panthéon Sorbonne, was founded in the mid-1980s by Philippe Aydalot and is chaired by one of the present authors.
5. Territorial capital has similarities with other concepts, such as the community development assets notion proposed by the Asset Based Community Development Institute and published in KRETZMAN and MCKNIGHT (1993). The community development concept is oriented to finding the 'assets' (or better negative specificities) triggering appropriate policies through which social and economic conflicts can be overcome. The territorial capital concept, on the other hand, is used to identify the assets on which actual local success is based.
6. 'Rivalry' refers to the nature of goods: rival goods are those whose consumption by one consumer prevents simultaneous consumption by other consumers (CORNES and SANDLER, 1986).
7. A third intermediate class, assimilated here to the category of private goods, could be represented by 'toll goods', a type of public goods whose use, being excludable, is subject to a toll levied by the public administration or by a concessionaire. The closer the price paid to the production and maintenance cost, the less these public goods are distinguishable from ordinary private goods.
8. In terms of a public/private nature, relational capital and *milieu* effects belong to an intermediate class, comprising 'collective' rather than public efforts and investments and giving rise to beneficial effects that can be exploited only

by selectively chosen partners located in particular territories with specific identities and sharing similar interests and values. The concept of club goods seems the one best suited to interpreting this condition.

9. The controversy between the two Cambridges (Cambridge in the UK and Cambridge in Massachusetts) – sometimes simply called ‘the capital controversy’ – refers to a theoretical debate during the 1960s among economists concerning the nature, role and measurement of capital.
10. ‘NUTS’ is Nomenclature des Unités Territoriales Statistiques.
11. For a comprehensive presentation of the MASST model and its estimations, see CAPELLO (2007b) and CAPELLO *et al.* (2008). For an updated and innovative version of MASST, see CAPELLO and FRATESI (2012).
12. For examples of replicas of national aggregate models at regional level, see CAPELLIN (1975, 1976); for regional growth models based on input–output relationships, see TREYZ *et al.* (1992) and GUZZI *et al.* (1996).
13. The idea of measuring local competitiveness through relative regional growth is common to other works (STIMSON *et al.*, 2005; STIMSON and STOUGH, 2005).
14. With this methodology, the difference in growth is the result of two intertwined effects: the assumptions of the territorial capital elements, based on extrapolated trends of the past; and the elasticity of each territorial capital element to regional growth. The latter has a much higher effect than the former. The expected increases in the future stock of territorial capital elements are in fact very limited, since they measure structural changes.
15. Other matrices have been used (the contiguity matrix, in particular) and the results do not change.
16. A typology of settlement structures of regions has been identified within ESPON (Project 1.1.1.). Regions are in fact divided among agglomerated, urban and rural regions on the basis of the type of urban system (size and density of cities) present in the region. Moreover, ESPON has identified the so-called ‘MEGAs’ (Metropolitan European growth areas), selected on the basis of five functional specialization and performance indicators, namely: population, accessibility, manufacturing specialization, degree of knowledge, and the distribution of headquarters of top European firms. All these variables have been collected at the functional urban area (FUA) level and combined to give an overall ranking of FUAs; the seventy-six FUAs with the highest average scores have been labelled MEGAs. MEGA regions are the NUTS-2-level administrative areas with at least one of the seventy-six FUAs located in it.
17. This element is also present in case of physical, costly capital assets, for example the effects of increasing agglomeration externalities on the value of property (real estate) assets.

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