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The Impact of the Economic Crisis on the Territorial Capital of Italian Regions

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The Impact of the Economic Crisis on the Territorial Capital of Italian Regions.

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1. INTRODUCTION

Our idea of Development is independent from the economic theory about Developing Countries elaborated in the Fifties. This theory assumes that the analysis of social, political and institutional relations and changes are useful only for the study of those countries, while the analysis of the Developed Countries should be relative to “economic growth” only. That vision showed a one-dimensional idea of growth, based on the analysis of GDP per capita, only, without a concentration measure of the income. The scholars have been partially got over this relevant limit of the economic theory throughout the contribute of Amartya Sen (1990, 2001), with his concepts of “capabilities” and “attributes”, which are the choices could be have the people using the rights and opportunities of the society where they lives.

The idea is to get over the growth theory based on the increasing of the GDP per capita shifting to the concept of multi-dimensional development. It has to take simultaneously into account the economical, social, political and institutional changes those contributes to better life of citizens and to improve the “freedoms”, meaning possibilities to choice.

The measurement of the territorial capital of Italian regions born to answer to a “new” idea of development: it is crucial to give the tools to the policy makers to stimulate the actions in favour of increasing the territorial capital to make the regions more attractive.

In this paper we are going to analyse the measure of territorial capital for the Italian regions using 48 variables which contributes to define eight dimensions of territorial capital for the years 2003 and 2009. The eight dimensions have been synthesised in a single indicator. We have take the main dimensions of territorial capital (productive, cognitive, social, relational, environmental, settlement and infrastructural assets) identified by Camagni and Dotti (2010) as a starting point we adding the eighth dimension, the human one.

In the second section we have identified 43 proxies to capture the eight dimensions of territorial capital. We have standardised and to take the same unit of measure (see Methodological annex for more details and the list of the variables utilised). In the third section

were calculated the synthetic indexes related to the eight dimensions of territorial capital for all the 20 Italian regions.

The paper has the double purpose to allow a comparative analysis among the Italian regions and to evaluate the impact of the recent crisis on the structural economic and social characteristics of territorial capital in the Italian regions.

2. THE DIMENSIONS OF TERRITORIAL CAPITAL

2.1. HUMAN CAPITAL

A solid and lasting process of economic and social development in the context of international competition is highly conditional on the accumulation of human capital: an educated and skilled labor force favors the strengthening and the innovation of the economic activities that are rooted in a territory and the attraction of new ones from outside (Camagni, 2009). The variables that are considered in order to measure the supply of human capital of regional economies are: rate of enrollment in upper secondary education (ISCED 3), rate of early leavers from upper secondary education, index of university attractiveness, share of graduates in technical and scientific disciplines¹.

The Central regions, as a macro-area, appear to be endowed with the greatest stock of human capital both in 2003² and 2009, whereas Emilia-Romagna has highest the regional index of human capital in both years (0.89 in 2003 and 0.79 in 2009). During the considered period a decrease of the synthetic index is observed in all regions (Figures 2.1 and 2.2) with the only exceptions of Trentino-Alto Adige, Puglia and Campania, which do not appear to be among the most highly endowed regions. Umbria, which is the second region for human capital endowment in 2003, also experiences a decrease of the index in 2009 (from 0.87 to 0.75) and loses some positions relative to the other regions. Lazio, although its index of human capital decreases from 0.82 in 2003 to 0.77 in 2009, gains three positions in the ranking and appears to be the second region for human capital stock in 2009 just after Emilia-Romagna.

The regions with the lowest human capital are Valle d'Aosta (0.22 in 2003 and 0.17 in 2009) and Sicilia (0.43 in 2003 and 0.36 in 2009), mostly because of a low share of graduates in scientific disciplines, a poor university attractiveness (Valle d'Aosta) and a high rate of early leavers from education (Sicilia).

¹ The choice of the variables to be considered is strongly conditional on the availability and updating of regional data concerning all the assets of territorial capital. The procedure that was followed for standardizing the variables and building the synthetic index is described in the methodological annex.

² Data for year 2003 were calculated as the average for the period 2002-2003-2004 for all considered variables.

Table 2.1. Human capital in the Italian regions (standardized variables, average value 2002-2003-2004)

	Rate of enrollment in upper secondary education (1)	Rate of early leavers from upper secondary education (2)	Index of university attractiveness (3)	Share of graduates in technical and scientific disciplines (4)	<i>Human capital (synthetic index)</i>
PIEMONTE	0,60	0,50	0,83	0,77	0,67
VALLE D'AOSTA	0,60	0,72	0,00	0,00	0,22
LOMBARDIA	0,48	0,67	0,88	0,82	0,63
LIGURIA	0,88	0,57	0,78	0,84	0,73
TRENTINO-A. A.	0,00	0,17	0,80	0,44	0,52
VENETO	0,54	0,26	0,83	0,63	0,68
FRIULI-VENEZIA GIULIA	0,84	0,12	0,89	0,82	0,86
EMILIA-ROMAGNA	0,84	0,28	1,00	1,00	0,89
TOSCANA	0,82	0,44	0,92	0,99	0,82
UMBRIA	0,93	0,00	0,94	0,61	0,87
MARCHE	0,92	0,15	0,88	0,58	0,81
LAZIO	1,00	0,44	0,91	0,80	0,82
ABRUZZO	0,85	0,27	0,86	0,48	0,73
MOLISE	0,83	0,19	0,67	0,01	0,58
CAMPANIA	0,52	0,90	0,82	0,48	0,48
PUGLIA	0,55	0,76	0,70	0,26	0,44
BASILICATA	0,92	0,39	0,29	0,25	0,52
CALABRIA	0,64	0,54	0,62	0,42	0,54
SICILIA	0,55	1,00	0,82	0,35	0,43
SARDEGNA	0,77	0,83	0,78	0,43	0,54

Source: own elaborations on Istat data

Table 2.2. Human capital in the Italian regions (standardized variables, 2009)

	Rate of enrollment in upper secondary education* (1)	Rate of early leavers from upper secondary education (2)	Index of university attractiveness (3)	Share of graduates in technical and scientific disciplines (4)	<i>Human capital (synthetic index)</i>
PIEMONTE	0,17	0,45	0,86	0,75	0,58
VALLE D'AOSTA	0,32	0,68	0,00	0,03	0,17
LOMBARDIA	0,00	0,58	0,94	0,72	0,52
LIGURIA	0,45	0,55	0,85	0,71	0,61
TRENTINO-A. A.	0,12	0,00	0,81	0,33	0,55
VENETO	0,15	0,12	0,83	0,51	0,59
FRIULI-VENEZIA GIULIA	0,47	0,12	0,93	0,80	0,77
EMILIA-ROMAGNA	0,55	0,34	1,00	0,95	0,79
TOSCANA	0,61	0,43	0,96	0,87	0,75
UMBRIA	0,74	0,20	0,94	0,53	0,75
MARCHE	0,78	0,35	0,87	0,70	0,75
LAZIO	0,54	0,40	0,97	1,00	0,77
ABRUZZO	0,59	0,28	0,94	0,41	0,66
MOLISE	0,74	0,27	0,70	0,00	0,53
CAMPANIA	0,35	0,64	0,81	0,49	0,50
PUGLIA	0,42	0,40	0,71	0,29	0,51
BASILICATA	1,00	0,30	0,11	0,16	0,47
CALABRIA	0,50	0,41	0,66	0,42	0,53
SICILIA	0,21	0,86	0,79	0,29	0,36
SARDEGNA	0,80	1,00	0,78	0,35	0,48

* Data refer to 2008

Source: own elaborations on Istat data

Note: In order to calculate the synthetic index, we used the one's complement of the standardized values of the variables included in the dashed box, whose contribution to the territorial capital is negative for higher values assumed by the variable. Further details are provided in the methodological annex.

Variables legend:

- (1) Rate of enrollment in upper secondary education (ISCED 3). Ratio between the total of students enrolled in upper secondary education over the resident population aged 14-18.
- (2) Rate of early leavers from upper secondary education (first two years): early leavers over the total number of students enrolled in the first two years of upper secondary schools.
- (3) Index of university attractiveness: ratio between the net migration rate of students and the total number of enrolled students.
- (4) Graduates in technical and scientific disciplines. Graduates in technical and scientific disciplines over 1000 inhabitants aged 20-29. Technical and scientific disciplines are defines as those which correspond to ISCED fields of education 42, 44, 46, 48, 52, 54 and 58.

Figure 2.1. Human capital in the Italian regions (average value 2002-2003-2004)

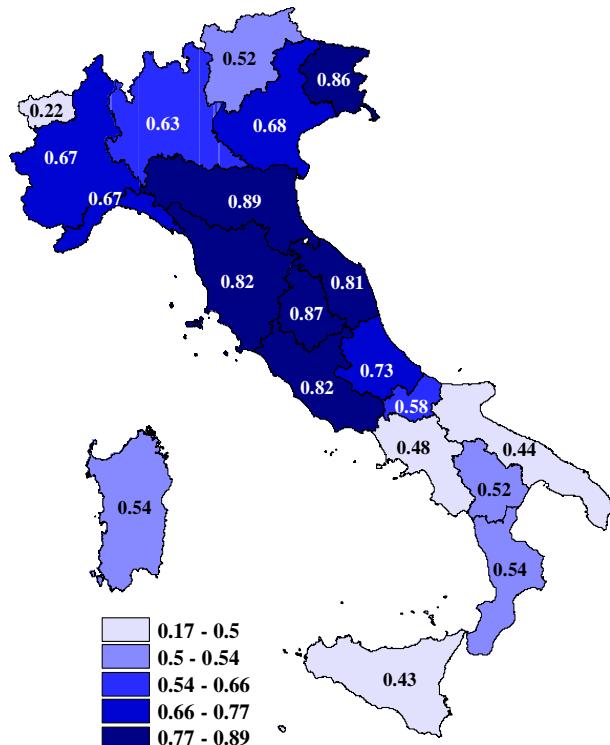
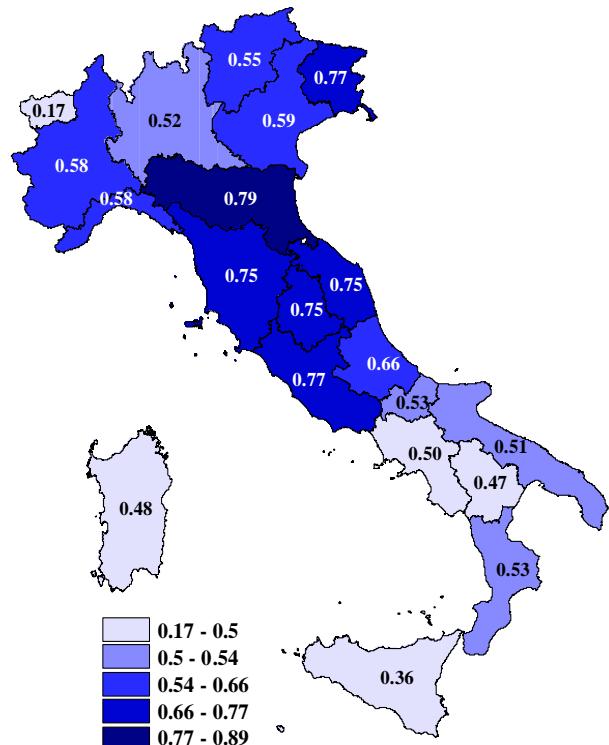


Figure 2.2. Human capital in the Italian regions (2009)



Source: own elaborations on Istat data

Source: own elaborations on Istat data

2.2. COGNITIVE CAPITAL

With the rise of the BRIC economies on the world scenario, the definition of new competitive strategies by western countries appears to be urgent and turned towards a “smart growth” (Europa 2020) and a “knowledge-based economy” (Lisbon Strategy).

At regional level, the endowment of cognitive capital is measured, on the one hand, in terms of propensity to research and innovation, which is an output of the integration between the education system (measured in terms of human capital) and productive structure (measured in terms of productive capital), and on the other hand in terms of cultural dynamism. The variables that are used in order to evaluate the endowment of cognitive capital for Italian regions are: R&D personnel, innovative capacity, patents applications, theatre and music performances, book readers, number of visitors of exhibitions and museums (Tables 2.3 and 2.4).

The synthetic index of cognitive capital shows a dynamic context of generalized growth with regards to the regions which are mostly endowed with this asset of territorial capital. In 2003, Lazio is the region characterized by the highest value of the index (0.72), mainly thanks to the levels of R&D personnel, innovative capacity, theatre and music performances. Emilia-Romagna (0.71), Piemonte (0.70), Lombardia (0.67) and Friuli-Venezia Giulia (0.66), that show high indexes with respect to all the considered variables (never below 0.5), closely follow. The regions with the most limited endowment of cognitive capital, relatively to all other Italian regions, appear to be the Southern ones (Figure 2.3).

The values of the synthetic index of cognitive capital relative to 2009 show, on average, a context of increased innovation and more dynamic cultural environment. The biggest differences with respect to 2003 are among those regions with the highest levels of cognitive capital (Figure 2.4): Friuli-Venezia Giulia gains positions between 2003 and 2009 relatively to all the considered variables and is the region with the higher cognitive capital in the final year (0.87). Trentino-Alto Adige, which is the second region in terms of cognitive capital in 2009 (0.80), also experiences an important improvement, whereas Emilia-Romagna, although it shows an increase in the value of the synthetic index (0.79 in 2009), loses a position relatively to the other regions. On the whole, Abruzzo is the only region whose synthetic index of cognitive capital decreases between 2003 (0.34) and 2009 (0.28).

Table 2.3. Cognitive capital in the Italian regions (standardized variables, average value 2002-2003-2004)

	R&D personnel (5)	Innovative capacity (6)	Patent applications (7)	Theatre and music performances (8)	Book readers (9)	Visitors of exhibitions and museums (10)	Cognitive capital (synthetic index)
PIEMONTE	0,72	0,88	0,75	0,54	0,80	0,55	0,70
VALLE D'AOSTA	0,18	0,00	0,35	0,52	0,90	0,55	0,42
LOMBARDIA	0,50	0,54	0,87	0,65	0,86	0,63	0,67
LIGURIA	0,46	0,61	0,32	0,65	0,90	0,45	0,57
TRENTINO-A. A.	0,35	0,22	0,32	0,75	1,00	1,00	0,61
VENETO	0,26	0,21	0,65	0,72	0,87	0,71	0,57
FRIULI-VENEZIA GIULIA	0,50	0,52	0,56	0,75	0,92	0,71	0,66
EMILIA-ROMAGNA	0,61	0,56	1,00	0,75	0,75	0,59	0,71
TOSCANA	0,45	0,50	0,45	0,83	0,73	0,52	0,58
UMBRIA	0,40	0,32	0,23	0,68	0,41	0,36	0,40
MARCHE	0,23	0,17	0,30	0,66	0,45	0,45	0,38
LAZIO	1,00	1,00	0,20	1,00	0,61	0,47	0,72
ABRUZZO	0,37	0,46	0,20	0,41	0,33	0,26	0,34
MOLISE	0,06	0,03	0,00	0,00	0,18	0,17	0,07
CAMPANIA	0,25	0,47	0,04	0,26	0,00	0,08	0,18
PUGLIA	0,11	0,17	0,04	0,18	0,02	0,09	0,10
BASILICATA	0,09	0,10	0,02	0,20	0,18	0,16	0,12
CALABRIA	0,00	0,01	0,01	0,12	0,05	0,00	0,03
SICILIA	0,16	0,31	0,06	0,31	0,04	0,07	0,16
SARDEGNA	0,18	0,21	0,02	0,39	0,65	0,43	0,31

Source: own elaborations on Istat, Eurostat data

Table 2.4. Cognitive capital in the Italian regions (standardized variables, average value 2009)

	R&D personnel (5)	Innovative capacity (6)	Patent applications (7)	Theatre and music performances (8)	Book readers (9)	Visitors of exhibitions and museums (10)	Cognitive capital (synthetic index)
PIEMONTE	0,89	1,00	0,80	0,55	0,76	0,66	0,78
VALLE D'AOSTA	0,35	0,17	0,19	0,49	0,87	0,83	0,48
LOMBARDIA	0,77	0,61	0,84	0,71	0,86	0,74	0,75
LIGURIA	0,71	0,66	0,49	0,60	0,78	0,45	0,62
TRENTINO-A. A.	0,77	0,62	0,58	0,81	1,00	1,00	0,80
VENETO	0,72	0,46	0,74	0,67	0,76	0,77	0,69
FRIULI-VENEZIA GIULIA	0,82	0,74	0,85	1,00	0,96	0,86	0,87
EMILIA-ROMAGNA	0,90	0,69	1,00	0,75	0,75	0,63	0,79
TOSCANA	0,63	0,56	0,47	0,69	0,70	0,55	0,60
UMBRIA	0,42	0,39	0,26	0,53	0,57	0,46	0,44
MARCHE	0,41	0,18	0,43	0,62	0,44	0,43	0,42
LAZIO	1,00	0,97	0,23	0,96	0,67	0,65	0,75
ABRUZZO	0,30	0,37	0,18	0,25	0,33	0,25	0,28
MOLISE	0,13	0,04	0,00	0,00	0,27	0,13	0,10
CAMPANIA	0,32	0,61	0,10	0,32	0,01	0,05	0,23
PUGLIA	0,17	0,24	0,08	0,25	0,03	0,00	0,13
BASILICATA	0,17	0,15	0,07	0,10	0,18	0,16	0,14
CALABRIA	0,00	0,00	0,01	0,09	0,08	0,06	0,04
SICILIA	0,16	0,29	0,04	0,36	0,00	0,13	0,16
SARDEGNA	0,19	0,15	0,07	0,45	0,51	0,52	0,32

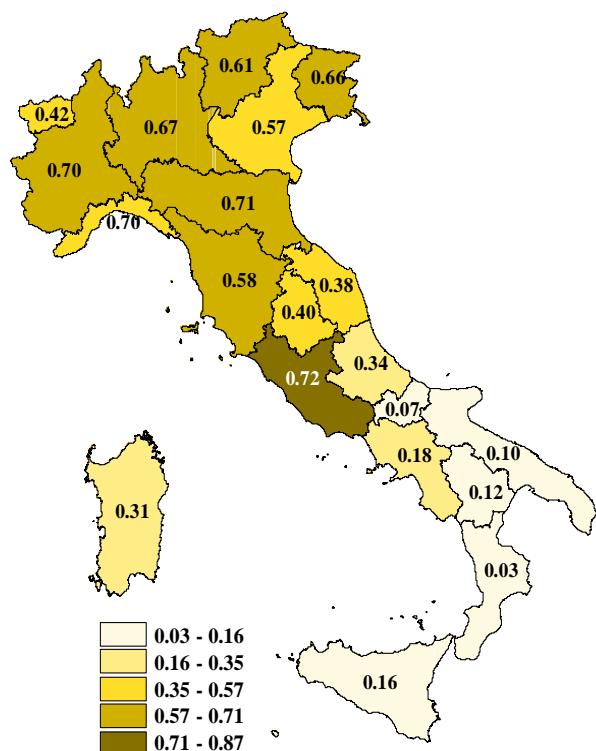
*Data refer to 2008

Source: own elaborations on Istat, Eurostat data

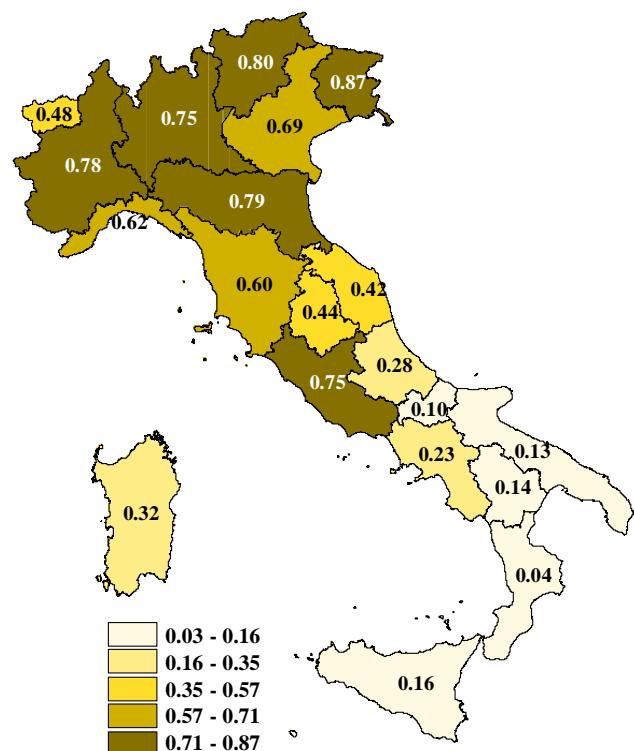
Variables legend:

- (5) R&D personnel: R&D personnel over 1000 inhabitants.
- (6) Innovative capacity: total intramural expenditure for R&D undertaken by the government sector, higher education sector, business enterprise sector. Percentage of GDP.
- (7) Patent applications to the EPO by priority year at the regional level, per million inhabitants.
- (8) Theatre and music performances: tickets sold per 100 inhabitants.
- (9) Book readers: persons aged 6 and over having read at least one book in the last 12 months per 100 people with the same characteristics.
- (10) Visitors of exhibitions and museums: persons aged 6 and over who declare to have visited exhibitions or museums at least once in the last year, over 100 people with the same characteristics.

**Figure 2.3. Cognitive capital in the Italian regions
(average value 2002-2003-2004)**



**Figure 2.4. Cognitive capital in the Italian regions
(2009)**



Source: own elaborations on Istat, Eurostat data

Source: own elaborations on Istat, Eurostat data

2.3. SOCIAL CAPITAL

The origin of the term social capital is normally attributed to L. J. Hanifa, who used it (1916) to describe the importance of the active support of local communities to ensure the effectiveness of rural primary schools in the state of Virginia, which he was involved with as a school inspector (and reformer). However, the revival (and modern fortune) of the term depends on R. Putnam, who used it to analyze both the United States and Italy (Putnam, 1993), and who also highlighted the importance of social capital as an intangible asset with relevant effects on the well-functioning of the social and political life of a community – hence of its economic performance. Between the two definitions, there is the extensive use of the term in sociological literature (roughly from 1960), with a different acceptance related to network functioning in a given community (De Blasio, Sestito, 2011).

Focusing the analysis at a regional level, a multidimensional approach has been chosen to measure social capital, ranging from the analysis of the NGO and voluntary scene to the working one, from people's interest in politics to their concern for the environment. The variables used to measure the social capital supply of Italian regions are: activities of voluntary work, number of people who made donations to NGOs, number of irregular workers over the total amount of workers, how frequently people enquire and discuss about politics, number of environmental crimes per 100 square kilometers (Tables 2.5 and 2.6).

The North-East holds the highest positions in the chart of social capital synthetic index; in fact, in both 2003 and 2009 Trentino-Alto Adige, Emilia-Romagna and Veneto held the highest positions. As to the downsides, in 2002/2003 the gap between North and South was strikingly evident: Campania, Calabria and Sicilia brought up the rear of the chart; the situation was particularly grave in the first two cases, where Campania held the negative record for three of the variables taken into account: activities of voluntary work, how frequently people enquire and discuss about politics and number of environmental crimes.

In 2009, the values in the synthetics index chart basically held steady with the only exceptions of Liguria – +0.14 thanks to the substantial decrease in the amount of environmental crimes (-0.70) – and Campania – +0.11 thanks to the significant decrease in the amount of irregular workers (-0.42), while Puglia's position dropped (-0.8) because of the increase of the amount of environmental crimes (+0.15) and a substantial decrease of people's interest in politics.

As to other regions, in 2009 Trentino-Alto Adige kept holding the highest position, immediately followed by Emilia-Romagna – with the lowest number of irregular workers over

the total number of workers – and Friuli-Venezia Giulia, which confirms the importance of social capital supply in the North-East.

Although with appreciable improvements in the synthetic index chart, the negative records of the South also held steady: Calabria held the last place – 0.13 in 2009 (+0.5 compared to 2002-2003), with the highest number of irregular workers over the total number – followed by Campania and Sicilia.

Table 2.5. Social capital in the Italian regions (standardized variables, average value 2002-2003)

	Voluntary activity (11)	People who donate to associations (12)	Irregular full time equivalent units over total units * (13)	Frequency with which people enquire and discuss about politics (14)	Number of environmental crimes ** (15)	Social capital (synthetic index)
PIEMONTE	0,26	0,40	0,07	0,60	0,02	0,63
VALLE D'AOSTA	0,42	0,48	0,14	0,47	0,02	0,64
LOMBARDIA	0,41	0,59	0,00	0,64	0,09	0,71
LIGURIA	0,21	0,47	0,05	0,79	0,94	0,50
TRENTINO-A. A.	1,00	1,00	0,05	0,49	0,00	0,89
VENETO	0,56	0,60	0,15	0,73	0,11	0,73
FRIULI-VENEZIA GIULIA	0,38	0,48	0,22	0,73	0,17	0,64
EMILIA-ROMAGNA	0,36	0,76	0,02	1,00	0,06	0,81
TOSCANA	0,35	0,67	0,07	0,91	0,27	0,72
UMBRIA	0,22	0,31	0,25	0,63	0,14	0,55
MARCHE	0,19	0,42	0,14	0,55	0,17	0,57
LAZIO	0,06	0,11	0,25	0,61	0,51	0,41
ABRUZZO	0,06	0,22	0,28	0,27	0,13	0,43
MOLISE	0,11	0,23	0,58	0,29	0,16	0,38
CAMPANIA	0,00	0,05	0,77	0,00	1,00	0,06
PUGLIA	0,11	0,13	0,52	0,15	0,39	0,30
BASILICATA	0,16	0,25	0,65	0,13	0,18	0,34
CALABRIA	0,05	0,08	1,00	0,12	0,85	0,08
SICILIA	0,03	0,00	0,74	0,11	0,36	0,21
SARDEGNA	0,19	0,37	0,60	0,52	0,22	0,45

* Average value 2002-2003-2004

** Average value 2003-2004

Source: own elaborations on Istat and Legambiente data

Table 2.6. Social capital in the Italian regions (standardized variables, 2009)

	Voluntary activity (11)	People who donate to associations (12)	Irregular full time equivalent units over total units * (13)	Frequency with which people enquire and discuss about politics (14)	Number of environmental crimes ** (15)	Social capital (synthetic index)
PIEMONTE	0,33	0,43	0,11	0,77	0,12	0,66
VALLE D'AOSTA	0,29	0,48	0,07	0,19	0,00	0,58
LOMBARDIA	0,47	0,61	0,04	0,64	0,16	0,70
LIGURIA	0,17	0,43	0,03	0,86	0,24	0,64
TRENTINO-A. A.	1,00	1,00	0,04	0,54	0,09	0,88
VENETO	0,51	0,55	0,12	0,83	0,15	0,72
FRIULI-VENEZIA GIULIA	0,39	0,54	0,21	1,00	0,10	0,72
EMILIA-ROMAGNA	0,49	0,65	0,00	0,97	0,16	0,79
TOSCANA	0,35	0,69	0,04	0,94	0,38	0,71
UMBRIA	0,29	0,41	0,14	0,57	0,12	0,60
MARCHE	0,35	0,49	0,11	0,42	0,10	0,61
LAZIO	0,10	0,28	0,11	0,66	0,71	0,45
ABRUZZO	0,07	0,15	0,18	0,43	0,15	0,46
MOLISE	0,09	0,10	0,55	0,18	0,03	0,36
CAMPANIA	0,00	0,05	0,35	0,15	1,00	0,17
PUGLIA	0,05	0,11	0,50	0,00	0,54	0,22
BASILICATA	0,20	0,31	0,68	0,03	0,13	0,35
CALABRIA	0,07	0,13	1,00	0,03	0,59	0,13
SICILIA	0,08	0,00	0,52	0,01	0,51	0,21
SARDEGNA	0,15	0,60	0,56	0,73	0,41	0,50

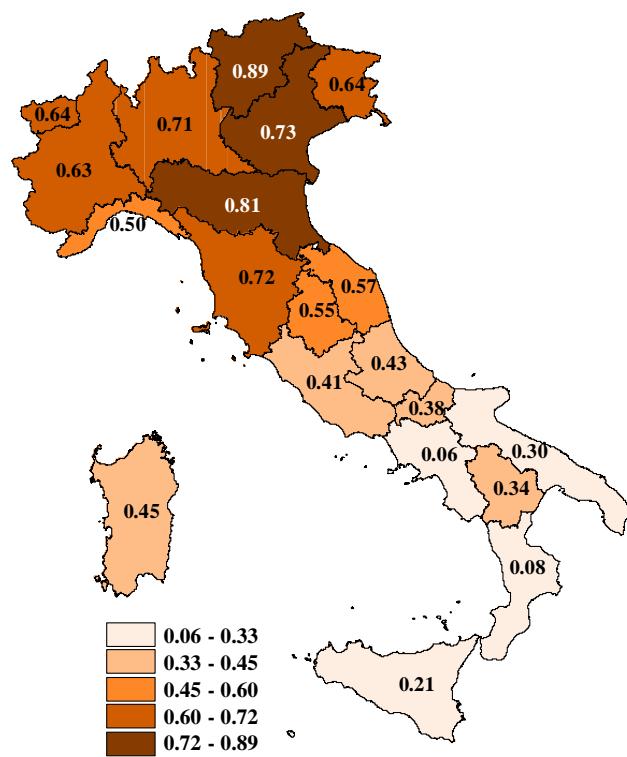
Source: own elaborations on Istat and Legambiente data

Note: In order to calculate the synthetic index, we used the one's complement of the standardized values of the variables included in the dashed box, whose contribution to the territorial capital is negative for higher values assumed by the variable. Further details are provided in the methodological annex.

Variables legend:

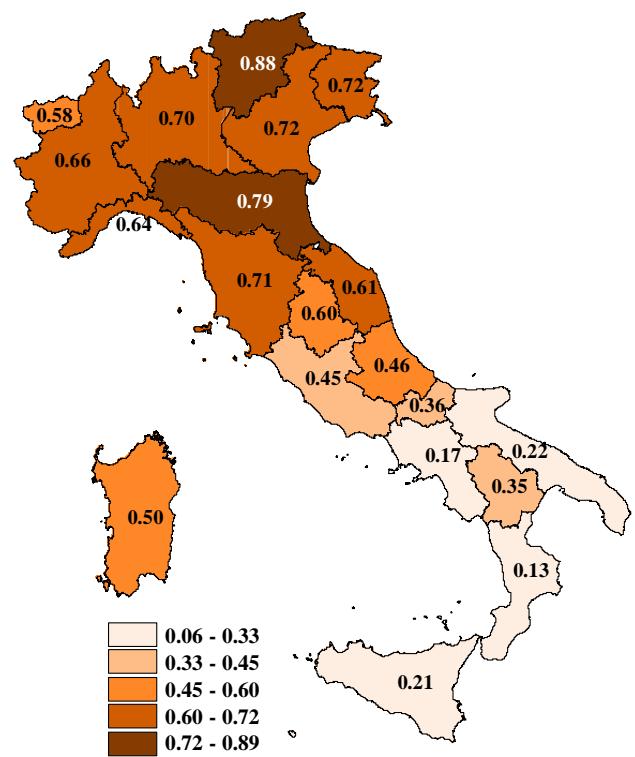
- (11) People aged 14 and above who carried out unpaid work for voluntary associations out of 100 people aged 14 and above.
- (12) People aged 14 and above who made donations to NGOs out of 100 people aged 14 and above.
- (13) Capacity to offer regular work: Irregular full time equivalent units over total units (%).
- (14) Frequency with which people enquire and discuss about politics: the sample survey "Aspects of everyday life" is part of an integrated system of social enquiries – Multipurpose enquiries on families – and inspects fundamental information about everyday life of individuals and families.
- (15) Number of environmental crimes.

Figure 2.5. Social capital in the Italian regions (average value 2002-2003)



Source: own elaborations on Istat and Legambiente data

Figure 2.6. Social capital in the Italian regions (2009)



Source: own elaborations on Istat and Legambiente data

2.4. INFRASTRUCTURAL CAPITAL

Infrastructural capital is usually referred to as a support system created by people to carry out economic activities in the best possible conditions, in terms of both time and savings. Hence, infrastructural capital is composed of the set of communication means (roads, airports, railways) that expedite and facilitate the exchange of people, goods and services. In accordance with such acceptation, it has been decided to utilize the following variables: people who travel by bus, trolley bus and tram who are satisfied with the frequency of rides; people who use busses and are satisfied with the frequency of rides; degree to which people are satisfied with the train service; index of usage of train services; usage of public transports; motorway network; active railway network; number of passengers flying by scheduled flights and charters.

In 2003, the Italian region to hold the best synthetic index for infrastructural capital measuring was Lombardia (0.69), which held the highest positions for two variables, motorway network and number of people flying by scheduled flights and charters. Lazio also held a very positive record (0.61), boasting the best usage of public transports as well as the best results in terms of satisfaction with the train services and the number of air passengers. The third place was unexpectedly held by Friuli-Venezia Giulia (0.66).

Once and again, the Italian Mezzogiorno held the negative records (Figures 2.7, 2.8). Sardinia showed a historical lack of infrastructures that emerged clearly from the synthetic index (last position with 0.19). Sicily, the other main Italian island, also showed very poor results, holding the negative record for the variable: people who travel by bus, trolley bus and tram who are satisfied with the frequency of rides, with very negative results also in terms of index of usage of train services (0.03) and the degree to which people are satisfied with them (0.15). To complete the triple, Calabria held the third last position, the worst degree of satisfaction with the train service.

Year 2009 showed a general, predictable improvement of the outcome of the synthetic index of infrastructural capital. The North of the Country proved once again to be holding the highest positions, Lombardia being at the top of the chart (0.71; +0.2) with the most developed motorway network. Friuli-Venezia Giulia also reconfirms its positive records (0.66; +0.3 compared to 2003), with the best indexes of usage of train services and usage of public transports. Trentino-Alto Adige (0.47; -0.3 compared to 2003) steadily held the best records of the variables measuring the degree of satisfaction with urban and extra-urban transports (Table 2.8).

The two islands kept bringing up the rear in 2009. Sicilia and Sardinia held the highest number of negative records for the variables taken into account, followed by Calabria and

Campania. Umbria unexpectedly held the third last position with 0.30 – a small decrease (-0.4) if compared to the 2003 results, yet enough to be overtaken by several other regions. The causes of such delays in the development of infrastructures can be ascribed to the distance from primary motorway and railway networks as well as to the lack of important airport infrastructures.

Table 2.7. Infrastructural capital in the Italian regions (standardized variables, average value 2002-2003)

	People who travel with bus, trolley bus and tram who are satisfied with the frequency of rides (16)	People who travel with couch and are satisfied with the frequency of rides (17)	Degree of satisfaction of the train service (18)	Index of utilization of train services (19)	Utilization of public transports (20)	Motorway network per region * (21)	Active railway per region * (22)	People flying on national and international flights * (23)	<i>Infrastructural capital (synthetic index)</i>
PIEMONTE	0,61	0,57	0,59	0,63	0,44	0,46	0,73	0,10	0,52
VALLE D'AOSTA	0,97	1,00	0,77	0,33	0,13	0,49	0,10	0,00	0,47
LOMBARDIA	0,61	0,50	0,59	0,60	0,57	1,00	0,65	1,00	0,69
LIGURIA	0,63	0,82	1,00	0,60	0,44	0,35	1,00	0,03	0,61
TRENTINO-A. A.	1,00	1,00	0,79	0,74	0,15	0,20	0,12	0,00	0,50
VENETO	0,73	0,71	0,82	0,61	0,26	0,37	0,61	0,29	0,55
FRIULI-VENEZIA GIULIA	0,87	0,84	0,68	1,00	0,95	0,39	0,57	0,02	0,66
EMILIA-ROMAGNA	0,87	0,89	0,73	0,63	0,00	0,37	0,40	0,14	0,50
TOSCANA	0,57	0,57	0,56	0,74	0,24	0,27	0,61	0,11	0,46
UMBRIA	0,78	0,42	0,67	0,30	0,07	0,10	0,35	0,00	0,34
MARCHE	0,85	0,79	0,81	0,38	0,13	0,25	0,30	0,02	0,44
LAZIO	0,30	0,24	0,95	0,44	1,00	0,39	0,62	0,95	0,61
ABRUZZO	0,80	0,76	0,68	0,16	0,39	0,47	0,44	0,01	0,46
MOLISE	0,57	0,93	0,41	0,30	0,42	0,12	0,63	0,00	0,42
CAMPANIA	0,29	0,12	0,76	0,38	0,79	0,47	0,75	0,15	0,46
PUGLIA	0,22	0,69	0,53	0,45	0,49	0,23	0,35	0,08	0,38
BASILICATA	0,59	0,63	0,34	0,26	0,62	0,04	0,23	0,00	0,34
CALABRIA	0,29	0,13	0,00	0,57	0,44	0,28	0,53	0,05	0,29
SICILIA	0,00	0,41	0,16	0,04	0,25	0,34	0,49	0,30	0,25
SARDEGNA	0,26	0,00	0,79	0,00	0,29	0,00	0,00	0,15	0,19

* Average value 2002-2003-2004

Source: own elaborations on Istat data

Table 2.8. Infrastructural capital in the Italian regions (standardized variables, 2009)

	People who travel with bus, trolley bus and tram who are satisfied with the frequency of rides (16)	People who travel with couch and are satisfied with the frequency of rides (17)	Degree of satisfaction of the train service (18)	Index of utilization of train services (19)	Utilization of public transports (20)	Motorway network per region (21)	Active railway per region (22)	People flying on national and international flights * (23)	<i>Infrastructural capital (synthetic index)</i>
PIEMONTE	0,60	0,30	0,43	0,85	0,75	0,46	0,76	0,09	0,53
VALLE D'AOSTA	0,85	0,74	0,62	0,48	0,00	0,51	0,09	0,00	0,41
LOMBARDIA	0,58	0,51	0,48	0,76	0,80	1,00	0,71	0,86	0,71
LIGURIA	0,66	0,65	1,00	0,86	0,79	0,36	1,00	0,03	0,67
TRENTINO-A. A.	1,00	1,00	0,57	0,77	0,08	0,22	0,12	0,00	0,47
VENETO	0,79	0,62	0,69	0,72	0,18	0,41	0,63	0,30	0,54
FRIULI-VENEZIA GIULIA	0,93	0,77	0,35	1,00	1,00	0,39	0,56	0,02	0,63
EMILIA-ROMAGNA	0,89	0,89	0,63	0,82	0,08	0,37	0,54	0,15	0,55
TOSCANA	0,61	0,74	0,60	0,89	0,12	0,27	0,61	0,15	0,50
UMBRIA	0,56	0,26	0,55	0,52	0,07	0,10	0,34	0,00	0,30
MARCHE	0,81	0,86	0,55	0,59	0,14	0,26	0,30	0,01	0,44
LAZIO	0,22	0,17	0,66	0,75	0,83	0,39	0,74	1,00	0,59
ABRUZZO	0,66	0,72	0,54	0,27	0,23	0,47	0,40	0,01	0,41
MOLISE	0,68	0,88	0,39	0,41	0,82	0,12	0,58	0,00	0,48
CAMPANIA	0,27	0,00	0,65	0,61	0,99	0,47	0,86	0,14	0,50
PUGLIA	0,29	0,67	0,54	0,42	0,36	0,23	0,33	0,10	0,37
BASILICATA	0,77	0,78	0,43	0,25	0,68	0,04	0,25	0,00	0,40
CALABRIA	0,42	0,23	0,00	0,62	0,59	0,28	0,52	0,06	0,34
SICILIA	0,00	0,38	0,15	0,03	0,31	0,37	0,48	0,30	0,25
SARDEGNA	0,49	0,18	0,67	0,00	0,10	0,00	0,00	0,17	0,20

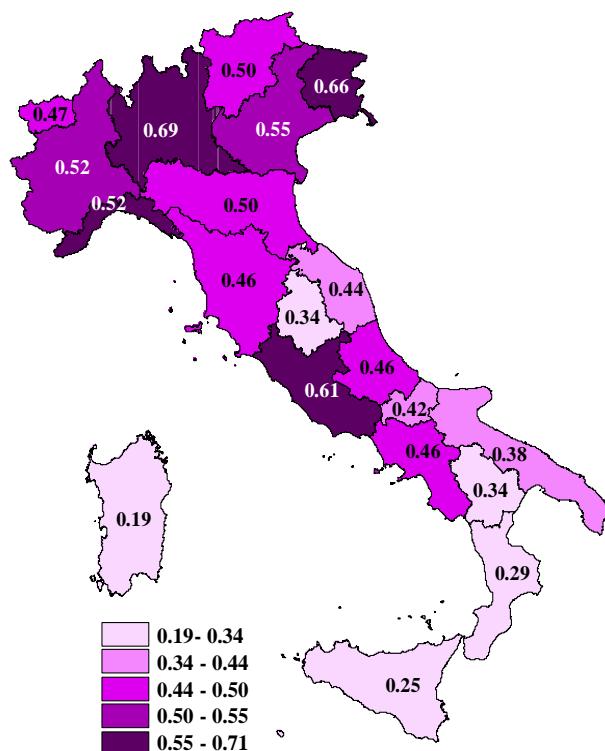
*For region Valle d'Aosta data are updated to 2008

Source: own elaborations on Istat data

Variables legend:

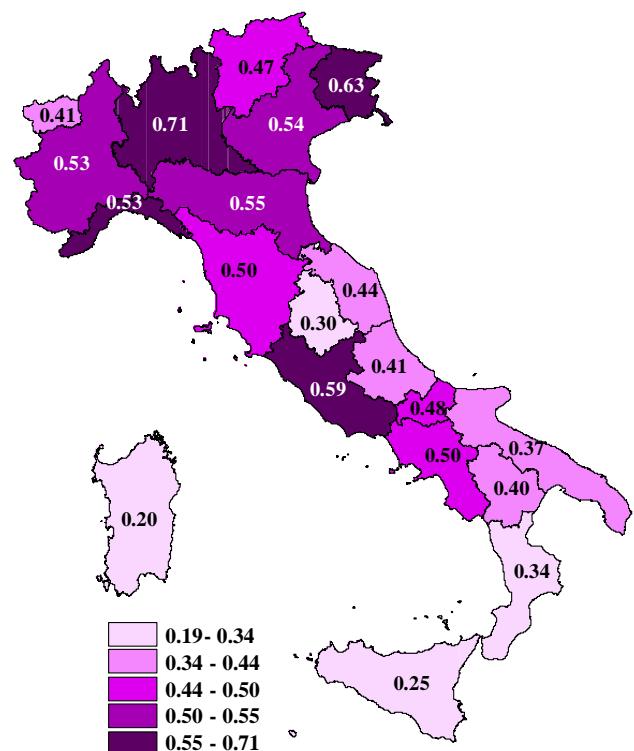
- (16) People who travel with bus, trolley bus and tram who are satisfied with the frequency of rides out of 100 people aged 14 and above.
- (17) People who travel with couch and are satisfied with the frequency of rides out of 100 people aged 14 and above.
- (18) Degree of satisfaction of the train service: Average of people who claim to be satisfied with the seven different categories of the service over the total.
- (19) Index of utilization of train services: People who travelled by train at least once a year out of the total amount of population aged 14 and above.
- (20) Utilization of public transports: employed people, students, people using transports out of people who moved for work and study reasons and use public transports (%).
- (21) Motorway network per region (Km per 1,000 Km²).
- (22) Active railway per region (km per 100 Km²).
- (23) People flying on national and international flights (scheduled flights and charters) per region: the data for Valle d'Aosta are not available for 2009; in Basilicata, Molise and the province of Trento there are not airports included in the survey.

Figure 2.7. Infrastructural capital in the Italian regions (average value 2002-2003)



Source: own elaborations on Istat data

Figure 2.8. Infrastructural capital in the Italian regions (2009)



Source: own elaborations on Istat data

2.5. PRODUCTIVE CAPITAL

The productive capital provides a measure of the territorial productive structure, and is identified by a group of variables belonging to two main categories: entrepreneurial density (index of entrepreneurship) and industrial activities (labour productivity in industry excluding construction, employees in industry over the total employees, industrial energy intensity)³.

In 2003 Emilia-Romagna region recorded the highest productive capital index in Italy (0.8), with high values for all the analyzed indicators, followed by the other manufacturing regions: Veneto (0.77), Piemonte and Lombardia (both at 0.75), and Marche (0.72). The Southern Italy and Islands are characterized by lower values of productive capital (Figure 2.9).

In 2009 the synthetic index of productive capital declined in all the Italian regions- with the exception of Marche, Abruzzo and Lazio-, thus confirming the higher impact of the financial crisis on the manufacturing sector. However, still in 2009 the highest values were recorded in the industrial regions: Emilia-Romagna (0.74), Marche (0.73), Veneto (0.70) and Piemonte (0.68), followed by Lombardia, Abruzzo, Trentino Alto-Adige and Toscana (both at 0.64).

Table 2.9. The productive capital in the Italian regions (standardized variables, average value 2002-2003-2004)

	Index of entrepreneurship (24)	Labour productivity in industry (excluding construction) (25)	Employees in industry/total employees (26)	Industrial energy intensity (27)	Productive capital (synthetic index)
PIEMONTE	0.73	0.56	0.96	0.24	0.75
VALLE D'AOSTA	1.00	0.66	0.30	0.33	0.66
LOMBARDIA	0.45	0.79	0.93	0.17	0.75
LIGURIA	0.51	0.59	0.05	0.09	0.51
TRENTINO-A. A.	0.98	0.57	0.37	0.17	0.69
VENETO	0.81	0.43	1.00	0.18	0.77
FRIULI-VENEZIA GIULIA	0.48	0.33	0.76	0.49	0.52
EMILIA-ROMAGNA	0.94	0.56	0.84	0.13	0.80
TOSCANA	0.81	0.34	0.60	0.20	0.64
UMBRIA	0.75	0.26	0.68	0.45	0.56
MARCHE	0.98	0.00	0.99	0.11	0.72
LAZIO	0.00	1.00	0.03	0.03	0.50
ABRUZZO	0.86	0.29	0.54	0.27	0.61
MOLISE	0.95	0.09	0.55	0.37	0.55
CAMPANIA	0.24	0.06	0.30	0.11	0.38
PUGLIA	0.43	0.02	0.34	0.38	0.35
BASILICATA	0.70	0.10	0.57	0.36	0.50
CALABRIA	0.19	0.27	0.04	0.00	0.37
SICILIA	0.25	0.47	0.00	0.36	0.34
SARDEGNA	0.52	0.46	0.23	1.00	0.30

Source: own elaborations on Istat, Movimprese and Terna data

³ Variables referring to fixed assets were not included in the computation of the index, since updated data at regional level were not available.

Similar to 2003, regions showing lower productive capital values are located in the Southern Italy and Islands, although Abruzzo and Molise display high values of the index (Figure 2.10).

Table 2.10. The productive capital in the Italian regions (standardized variables, 2009)

	Index of entrepreneurship (24)	Labour productivity in industry (excluding construction) (25)	Employees in industry/total employees (26)	Industrial energy intensity (27)	Productive capital (synthetic index)
PIEMONTE	0.71	0.56	0.66	0.22	0.68
VALLE D'AOSTA	0.84	0.67	0.25	0.23	0.63
LOMBARDIA	0.30	0.63	0.79	0.16	0.64
LIGURIA	0.45	0.53	0.08	0.02	0.51
TRENTINO-A. A.	0.92	0.44	0.34	0.13	0.64
VENETO	0.67	0.37	0.91	0.15	0.70
FRIULI-VENEZIA GIULIA	0.13	0.28	0.72	0.46	0.42
EMILIA-ROMAGNA	0.86	0.49	0.72	0.10	0.74
TOSCANA	0.86	0.35	0.50	0.16	0.64
UMBRIA	0.64	0.29	0.56	0.38	0.53
MARCHE	1.00	0.00	1.00	0.08	0.73
LAZIO	0.18	1.00	0.04	0.00	0.56
ABRUZZO	0.89	0.34	0.55	0.20	0.64
MOLISE	0.97	0.11	0.46	0.32	0.55
CAMPANIA	0.19	0.17	0.25	0.11	0.37
PUGLIA	0.24	0.09	0.29	0.36	0.31
BASILICATA	0.66	0.16	0.38	0.40	0.45
CALABRIA	0.04	0.11	0.03	0.00	0.30
SICILIA	0.00	0.38	0.00	0.38	0.25
SARDEGNA	0.49	0.40	0.12	1.00	0.25

Source: own elaborations on Istat, Movimprese and Terna data

Note: In order to calculate the synthetic index, we used the one's complement of the standardized values of the variables included in the dashed box, whose contribution to the territorial capital is negative for higher values assumed by the variable. Further details are provided in the methodological annex.

Variables legend:

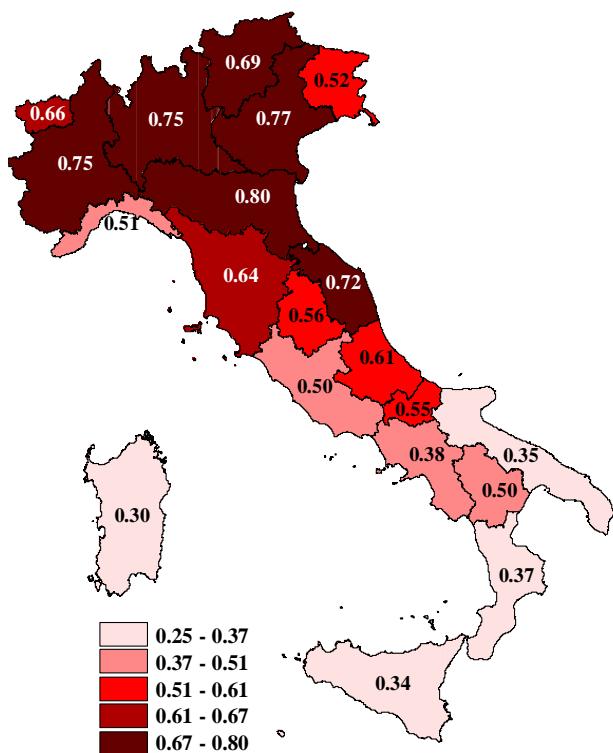
(24) Index of entrepreneurship: active firms/ resident population.

(25) Labour productivity in industry (excluding construction): value added in industry (excluding construction) / full-time equivalent units in industry (excluding construction).

(26) Employees in industry over the total employees.

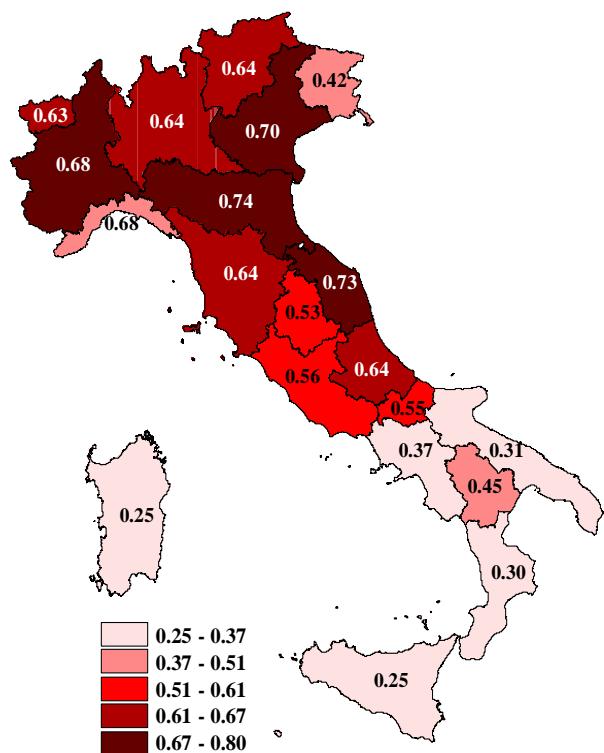
(27) Industrial energy intensity: industrial energy consumption (million Kwhs)/ value added in industry (at current prices).

Figure 2.9. The productive capital in the Italian regions (average value 2002-2003-2004)



Source: own elaborations on Istat, Movimprese and Terna data

Figure 2.10. The productive capital in the Italian regions (2009)



Source: own elaborations on Istat, Movimprese and Terna data

2.6. RELATIONAL CAPITAL

The relational capital can be defined as the sum of all the relationships developed by local actors both within and outside a given territory. The relational capital is one of the less traditional components of the territorial capital and is at the core of economic openness, growth and cooperation initiatives⁴.

To obtain a synthetic measure of relational capital for the Italian Regions a number of data limitations had to be taken into account. Indeed it is difficult to dispose of timely updated variables able to catch the features of the phenomenon under analysis. After a careful review, the following variables have been identified as the most appropriate candidates: export capacity, degree of openness, export capacity of sectors with a dynamic demand in the world market, banking office coverage index and number of active Spin-offs.

In 2003 the Region with the highest relational capital was Lombardia (0.69) followed by Emilia-Romagna (0.66), and Piemonte (0.57). The lowest levels of relational capital were recorded in the Southern Italy and Islands, in particular in Calabria (0.08), Puglia and Molise (both at 0.16), with the exception of Basilicata (Figure 2.11).

Table 2.11. The relational capital in the Italian regions (standardized variables, average value 2002-2003-2004)

	Export capacity (28)	Degree of openness (29)	Export capacity of sectors with a dynamic demand in the world market (30)	Banking office coverage index (31)	Number of active Spin-offs (32)	<i>Relational capital (synthetic index)</i>
PIEMONTE	0,88	0,54	0,47	0,48	0,50	0,57
VALLE D'AOSTA	0,33	0,24	0,15	0,78	0,00	0,30
LOMBARDIA	0,86	1,00	0,42	0,55	0,61	0,69
LIGURIA	0,28	0,51	0,39	0,46	0,54	0,44
TRENTINO-A. A.	0,52	0,44	0,20	1,00	0,08	0,45
VENETO	1,00	0,66	0,17	0,64	0,27	0,55
FRIULI-VENEZIA GIULIA	0,94	0,40	0,20	0,73	0,19	0,49
EMILIA-ROMAGNA	0,88	0,44	0,22	0,75	1,00	0,66
TOSCANA	0,74	0,45	0,13	0,53	0,80	0,53
UMBRIA	0,41	0,26	0,04	0,53	0,11	0,27
MARCHE	0,79	0,28	0,00	0,63	0,11	0,36
LAZIO	0,22	0,40	1,00	0,30	0,08	0,40
ABRUZZO	0,71	0,40	0,63	0,32	0,00	0,41
MOLISE	0,29	0,15	0,12	0,26	0,00	0,16
CAMPANIA	0,25	0,22	0,51	0,02	0,15	0,23
PUGLIA	0,28	0,20	0,11	0,11	0,08	0,16
BASILICATA	0,45	0,09	0,94	0,22	0,00	0,34
CALABRIA	0,00	0,00	0,28	0,00	0,11	0,08
SICILIA	0,19	0,44	0,34	0,12	0,11	0,24
SARDEGNA	0,24	0,37	0,07	0,22	0,00	0,18

* Data refer to the 2002-2005 period

Source: own elaborations on Istat, Netval, Tidona Comunicazione data

⁴ R. Camagni (ed.) (1991), Innovation Networks: Spatial Perspectives, Belhaven-Pinter.

From 2003 to 2009 relational capital increased almost everywhere in Italy, Marche, Puglia, Sardegna and Friuli-Venezia-Giulia recorded the largest increases. Also in 2009 Lombardia (0.73), Emilia-Romagna (0.68) and Piemonte (0.60) placed at the top in the regional ranking of relation capital endowment. The worst performing regions of 2009 were instead Calabria (0.13), Molise (0.19) and Sicilia (0.21). The level of relational capital differs among the Italian Regions and it grows moving from the South to the North, with the exception of the Valle d'Aosta (Figure 2.12).

Table 2.12. The relational capital in the Italian regions (standardized variables, 2009)

	Export capacity (28)	Degree of openness (29)	Export capacity of sectors with a dynamic demand in the world market (30)	Banking office coverage index (31)	Number of active Spin-offs (32)	<i>Relational capital (synthetic index)</i>
PIEMONTE	0,79	0,57	0,41	0,51	0,71	0,60
VALLE D'AOSTA	0,33	0,14	0,06	0,73	0,00	0,25
LOMBARDIA	0,85	1,00	0,33	0,62	0,84	0,73
LIGURIA	0,41	0,57	0,42	0,51	0,24	0,43
TRENTINO-A. A.	0,48	0,46	0,17	1,00	0,13	0,45
VENETO	0,90	0,68	0,13	0,70	0,35	0,55
FRIULI-VENEZIA GIULIA	1,00	0,45	0,25	0,75	0,45	0,58
EMILIA-ROMAGNA	0,89	0,50	0,20	0,82	1,00	0,68
TOSCANA	0,71	0,47	0,14	0,62	0,75	0,54
UMBRIA	0,39	0,23	0,10	0,55	0,30	0,31
MARCHE	0,63	0,39	0,34	0,76	0,34	0,49
LAZIO	0,20	0,46	0,74	0,34	0,50	0,45
ABRUZZO	0,60	0,29	0,52	0,39	0,09	0,38
MOLISE	0,18	0,15	0,28	0,28	0,03	0,19
CAMPANIA	0,25	0,25	0,42	0,03	0,27	0,24
PUGLIA	0,25	0,30	0,35	0,13	0,41	0,29
BASILICATA	0,43	0,21	1,00	0,23	0,03	0,38
CALABRIA	0,00	0,00	0,40	0,00	0,24	0,13
SICILIA	0,21	0,39	0,09	0,14	0,24	0,21
SARDEGNA	0,30	0,51	0,00	0,20	0,42	0,29

*Data until September 2009

Source: own elaborations on Istat, Netval, Tidona Comunicazione data

Variables legend:

(28) Export capacity: value of export goods as percentage of the GDP.

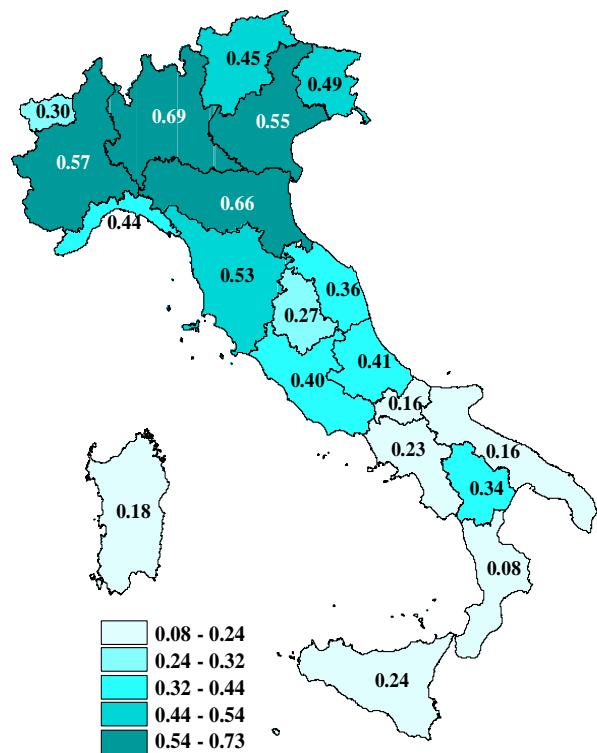
(29) Degree of openness: value of import as percentage of GDP.

(30) Export capacity of sectors with a dynamic demand in the world market: share of export of sectors with a dynamic demand in the world market as percentage of total export

(31) Banking office coverage index: number of banking offices per 100000 inhabitants.

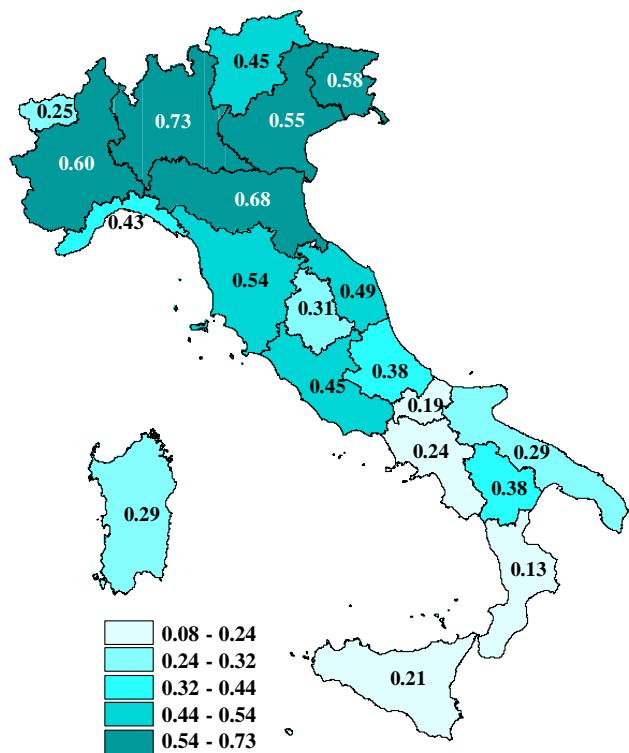
(32) Number of active Spin-offs.

Figure 2.11. The relational capital in the Italian regions (average value 2002-2003-2004)



Source: own elaborations on Istat, Netval, Tidona Comunicazione data

Figure 2.12. The relational capital in the Italian regions (2009)



Source: own elaborations on Istat, Netval, Tidona Comunicazione data

2.7. ENVIRONMENTAL CAPITAL

Territorial development policy must also aim, with great firmness, to preserve natural resources, to keep on ensure two values, which are absolutely necessary, especially at a time of economic crisis: intra-generational and inter-generational sustainability. The first one brings with it a low impact on environment and human health. The second one enables to bequeath to future generations the same chance to live in the same land.

Therefore, the environmental capital is built by considering all the variables that might condition, also permanently, the livability of the territory: the air quality, based on the number of families that reported air healthiness problems; the environmental protection expenditure and the availability of “public green”, indicating the institutional attention to natural resources; the use of chemistry in agriculture, which is closely linked to water quality and biological stress of the agricultural land; the amount of waste sorting, the water distribution and the efficiency of the electrical system, which give a measure of the optimal use of local resources.

In 2003, environmental capital has a substantial imbalance between Centre-North and South: the highest values are recorded in central and northern regions, with the exceptional presence of Basilicata among the most “green regions”; the lowest ones are recorded in the South, in Liguria and Lazio.

In 2009, in spite of the crisis, in all Italian regions we can observe an increase of environmental capital, compared to 2003. Even if the Italian productive system deteriorates throughout the country, Italy improves on many environmental structural variables. In general, there is a sharp increase in environmental protection expenditure and in waste sorting, a reduction in use of pesticides, an improvement of water and electricity distribution, reflecting two different dynamics: a new awareness of the importance of natural resources, driven mainly by European Union policies, and a clear rising trend in spite of the crisis.

In 2009 the dualism between North and South in “environmental capital availability” is partly smoothed, compared to 2003: at the last positions we find the regions of the South, together with Veneto, Liguria and Lazio, while the other southern regions Basilicata and Sardegna conquer a first-class position in environmental capital (third and fifth place respectively).

The detailed analysis of single variables provides us the opportunity to emphasize the great diversity of regional situations compared to the overall ranking of environmental capital. The worst region in air quality is Campania, with 32 families for every 100 families who report air healthiness problems, followed by Lazio (27%), Lombardia and Veneto (26%). In 2009,

however, there is a general reduction of air problems, although many critical issues are still unsolved.

The amount of environmental protection expenditure per capita provides an interesting evaluation of the attention in the "green sector" shown by regional institutions, regardless of the costs of crisis. The primacy belongs to Valle d'Aosta, which in 2003 spends almost 750 euros/per-capita, followed by Sardegna, with 329 euros/per-capita, and Trentino-Alto Adige, 308 euros/ per-capita. Emilia-Romagna, with 22 euros per-capita, is at the bottom. Furthermore, we underline the great expenditure in Calabria (200 euros per capita) but, at the same time, also the results far from excellence. In 2009, the ranking remains essentially the same. Emilia-Romagna reduces to 18 euros per capita its amount of expenditure, reinforcing the last position.

The availability of green public space, measured in square meters of "green available" per capita in chief town of province, in 2003 has its maximum in Abruzzo (almost 700 square meters of green available per capita) and Basilicata (578 sq m), followed by the Centre of Italy: Toscana (213 sq m), Umbria (198 sq m), Marche (170 sq m) and Emilia-Romagna (160 sq m). Molise is the last, with 18 square meters of green public per capita, then Calabria (20 sqm) and Valle D'Aosta (27 sq m). In 2009 a substantial equilibrium prevails, although in some chief town new green spaces rise (Veneto and Sicilia) and in others they are reduced, especially in Lazio and in the most green regions (Abruzzo, Basilicata, Umbria).

The use of plant protection products in agriculture outlines the pressure that the chemical industry imposes on agricultural land and surrounding waters. In the period from 2003 to 2009 all regions reduce their use, albeit slightly. The only exception is Veneto, which rises from 11.5 kg of active agents per hectare of UAA to 12 kg, becoming the first region in ranking in 2009, together with Sicilia (12.2 kg per hectare of UAA), Liguria (11.6 kg per hectare) and Emilia-Romagna (10.4 kg per hectare). In 2009, the regions with the lowest usage of plant protection products confirm their primacy: Valle d'Aosta (0.10 kg per hectare), Molise (1.1 kg per hectare), Sardegna (1.4 kg per hectare) and Basilicata (1.5 kg per hectare).

In 2009 the separate waste collection increases: from 21% to 33.6% of total waste collection. In 2009 the Trentino-Alto Adige becomes leader of the waste sorting (57.8%), followed by Veneto (57.5%), Friuli-Venezia Giulia (49.9%) and Piemonte (49.8%). Sicily grows up modestly, from 5.2% to 7.3% in 2009, but it reaches the bottom of the ranking, overtaken by progressive improvements in Sardegna and Molise. Sardegna shows a radical change in 5 years, rising from 4% to 42.5%.

The quality in the water distribution system is measured by the percentage of families who report irregularities and it represents a significant indicator for the correct use of water

resources of a territory. From 2003 to 2009 all regions improve their performance, but the most inadequate water system belongs to regions of southern Italy, Calabria and Sicilia, together at the bottom of the ranking. Initiatives to improve water services and waste management, through specific targets for the provision of public services, are financed by the Structural Funds. They provide a remarkable “performance reserve”, a sort of premium, dependent on the achievement of the targets in the period 2007-2013.

Finally, we included the interruption of electrical service among the environmental variables, because this variable provides an idea of the efficiency of the energy network management. The data, expressed by the frequency of “accidental long interruptions per user”, show that only some regions improve their performance. Southern Italy has the worst system.

Table 2.13. The environmental capital in the Italian regions (standardized variables, average value 2002-2003-2004)

	Families with air problems (33)	Environmental protection expenditure (34)	Green public spaces in chief town of province (35)	Use of plant protection products in agriculture (36)	Urban sorting waste (37)	Irregularities in water distribution (38)	Interruptions of electrical service (39)	Environmental capital (synthetic index)
PIEMONTE	0.46	0.05	0.04	0.72	0.65	0.13	0.33	0.44
VALLE D'AOSTA	0.00	1.00	0.01	0.00	0.51	0.18	0.00	0.76
LOMBARDIA	0.72	0.02	0.03	0.40	0.93	0.10	0.07	0.53
LIGURIA	0.45	0.03	0.03	0.94	0.32	0.09	0.27	0.38
TRENTINO-A. A.	0.19	0.39	0.16	0.52	0.77	0.01	0.54	0.58
VENETO	0.72	0.02	0.06	0.94	1.00	0.15	0.21	0.44
FRIULI-VENEZIA GIULIA	0.36	0.07	0.02	0.69	0.58	0.00	0.12	0.50
EMILIA-ROMAGNA	0.48	0.00	0.21	0.85	0.64	0.07	0.13	0.48
TOSCANA	0.42	0.03	0.29	0.34	0.65	0.30	0.34	0.51
UMBRIA	0.39	0.04	0.27	0.25	0.38	0.32	0.25	0.50
MARCHE	0.15	0.00	0.22	0.33	0.31	0.17	0.21	0.53
LAZIO	0.76	0.03	0.16	0.38	0.10	0.25	0.50	0.34
ABRUZZO	0.17	0.02	1.00	0.38	0.22	0.39	0.42	0.55
MOLISE	0.16	0.04	0.00	0.10	0.00	0.31	0.43	0.43
CAMPANIA	1.00	0.10	0.01	0.72	0.13	0.47	0.83	0.17
PUGLIA	0.48	0.02	0.12	0.58	0.12	0.61	0.46	0.31
BASILICATA	0.05	0.18	0.82	0.19	0.05	0.73	0.44	0.52
CALABRIA	0.31	0.25	0.00	0.39	0.12	1.00	1.00	0.24
SICILIA	0.43	0.10	0.10	1.00	0.04	1.00	0.81	0.14
SARDEGNA	0.47	0.42	0.13	0.12	0.01	0.76	0.82	0.34

Source: own elaborations on Istat and Legambiente data

Table 2.14. The environmental capital in the Italian regions (standardized variables, 2009)

	Families with air problems (33)	Environmental protection expenditure (34)	Green public spaces in chief town of province (35)	Use of plant protection products in agriculture (36)	Urban sorting waste (37)	Irregularities in water distribution (38)	Interruptions of electrical service (39)	Environmental capital (synthetic index)
PIEMONTE	0.42	0.03	0.05	0.57	0.84	0.09	0.18	0.52
VALLE D'AOSTA	0.00	1.00	0.02	0.00	0.63	0.09	0.12	0.78
LOMBARDIA	0.73	0.01	0.03	0.34	0.80	0.09	0.02	0.52
LIGURIA	0.42	0.03	0.03	0.74	0.34	0.01	0.22	0.43
TRENTINO-A. A.	0.07	0.39	0.15	0.44	1.00	0.01	0.21	0.69
VENETO	0.61	0.05	0.08	1.00	0.99	0.19	0.13	0.46
FRIULI-VENEZIA GIULIA	0.32	0.08	0.02	0.66	0.84	0.00	0.00	0.57
EMILIA-ROMAGNA	0.43	0.00	0.21	0.67	0.76	0.10	0.04	0.53
TOSCANA	0.40	0.05	0.29	0.33	0.55	0.30	0.15	0.53
UMBRIA	0.44	0.06	0.25	0.16	0.46	0.19	0.10	0.55
MARCHE	0.27	0.03	0.23	0.25	0.44	0.12	0.13	0.56
LAZIO	0.63	0.04	0.16	0.35	0.16	0.26	0.33	0.40
ABRUZZO	0.27	0.02	1.00	0.36	0.33	0.59	0.36	0.54
MOLISE	0.30	0.14	0.00	0.08	0.06	0.38	0.08	0.48
CAMPANIA	1.00	0.15	0.02	0.69	0.44	0.25	0.88	0.25
PUGLIA	0.60	0.08	0.13	0.40	0.13	0.53	0.50	0.33
BASILICATA	0.39	0.33	0.84	0.12	0.08	0.16	0.18	0.63
CALABRIA	0.38	0.28	0.00	0.28	0.10	1.00	0.85	0.27
SICILIA	0.51	0.19	0.11	1.00	0.00	0.75	1.00	0.15
SARDEGNA	0.32	0.36	0.13	0.11	0.70	0.35	0.46	0.56

Source: own elaborations on Istat and Legambiente data

Note: In order to calculate the synthetic index, we used the one's complement of the standardized values of the variables included in the dashed box, whose contribution to the territorial capital is negative for higher values assumed by the variable. Further details are provided in the methodological annex.

Variables legend:

- (33) Air quality: percentage of families that report air quality problems (per 100 families of the same area).
- (34) Environmental protection expenditure: (euro, current prices, per inhabitant).
- (35) Green public spaces availability: sq. m per inhabitant in chief town of province aggregated per region.
- (36) Use of plant protection products in agriculture: kg per hectare of di UA.
- (37) Municipal waste sorting: results in percent of total wastes.
- (38) Irregularities in water distribution system: families that report irregularities in water distribution (%).
- (39) Interruption of the electrical service: frequency of accidental long interruptions (unexpected and exceeding 3 minutes; average per user).

Figure 2.13. The environmental capital in the Italian regions (average value 2002-2003-2004)

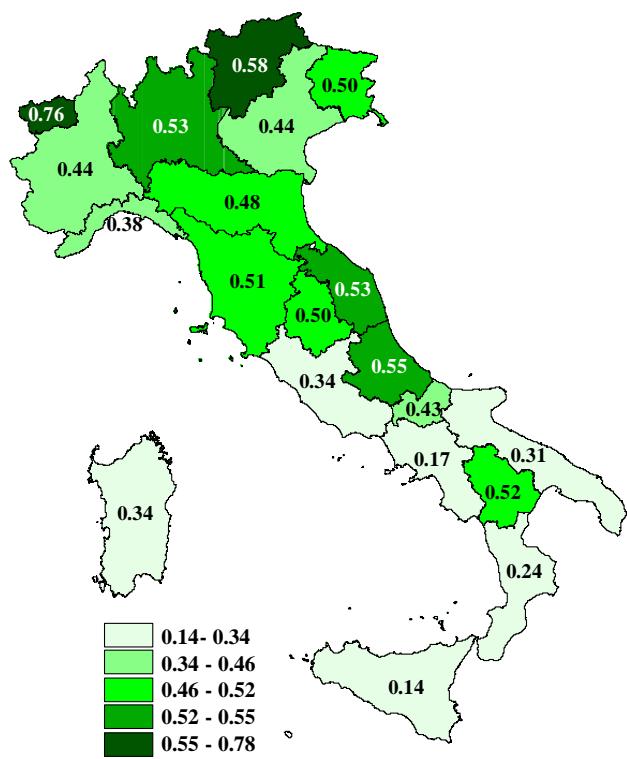
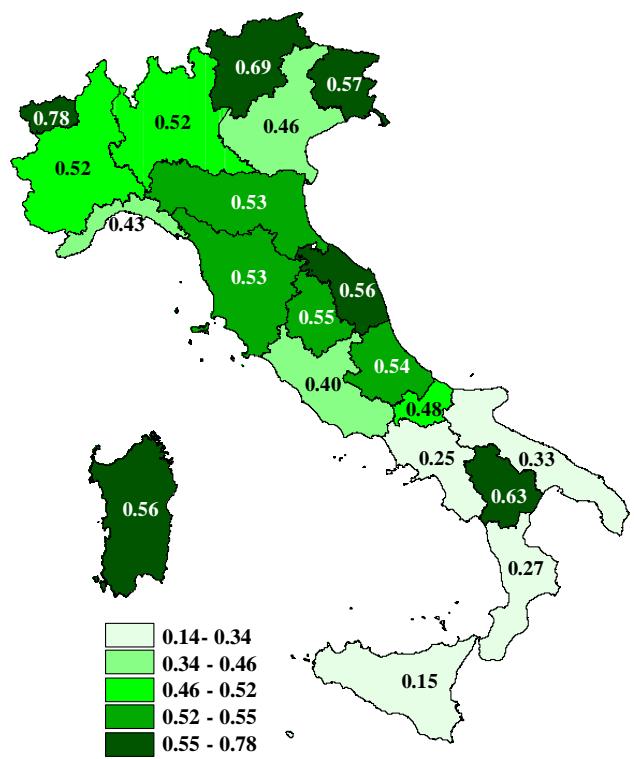


Figure 2.14. The environmental capital in the Italian regions (2009)



Source: own elaborations on Istat and Legambiente data

Source: own elaborations on Istat and Legambiente data

2.8. SETTLEMENT CAPITAL

The “settlement capital” provides a representation of the housing characteristics and the evolution of human presence in a territory, completing the full knowledge of the potentialities and criticalities of the territorial capital.

The four variables chosen to build the indicator of settlement capital, albeit with some limits, try to provide a measure of land consumption, which is one of the most vulnerable and valuable resource for a region.

First, the variable of population density is the fundamental information to evaluate the regional settlement pattern. A high density is connected with a strong human pressure: a more limited living space and a concentration of pollution, due to congestion of the population, with high production of waste and emissions and resources consumption. On the contrary, an extremely low population density is often linked to the phenomenon of "urban sprawl" (Camagni, 2006 and Bonora et al, 2011). The result is a disordered use of land and the dissolution of the fine line between city and countryside. For these reasons we will consider as optimal the balance between the two extremes.

The second and third variable, the number of new houses and new “habitable square meters” authorised every thousand households, express the housing sector intensity of a region. The last variable, the number of new residential edifices built every year in the total regional area, indicates the degree of proliferation of new buildings per 100 square kilometre and thus the pressure of population on the ground.

The settlement capital does not present any particular dualism between North and South of Italy, but we can identify some specific "leopard spots", recurring in both 2003 and 2009: the Trentino - Po Valley area (Trentino-Alto Adige, Lombardia, Veneto and Emilia-Romagna), with the lowest settlement capital, the north-west area, as far as Toscana, and the tip of Italy (Basilicata, Calabria and Sicilia), which would seem to hold the more solid settlement capital.

In 2003 Liguria is on the top of the ranking, with the highest index of settlement capital (0,82), followed by Piemonte (0.79), Sicilia (0.79), Toscana (0.77) and Basilicata (0.75). The lowest capital is recorded in Emilia-Romagna (0.47), Trentino-Alto Adige (0.45), Lombardia (0.25) and Veneto (0.18). In particular, Lombardia has a high population density and a swift growth of new residential edifices every 100 sq. km. In Veneto, the new overbuilding has led to overindulge and overstock the land.

In 2009, compared to 2003, the index of settlement capital decreases slightly (from a national average of 0.59 to 0.57): in the Italian regions, the population density increases (from

191 to 200 inhabitants per sq. km); at the same time the housing sector intensity and proliferation of new residential edifices get lower, subject to the great curb of the crisis.

Furthermore, in 2009 the number of new residential buildings authorised is halved: from 10.8 to 5.7 new dwellings every 1000 households authorised, from 811 to 430 new “habitable square meters” authorised per 1000 households. The proliferation of new residential edifices decreases too: if in 2003 there were more than 16 new buildings per 100 square kilometres, in 2009 are little more than 10.

In 2009, Toscana is on the top of the ranking (0.82), followed by Basilicata (0.81). Lombardia, with its national record in proliferation of new residential buildings, becomes the last (0.21), preceded by Trentino-Alto Adige (0.33), Veneto (0.35) and Lazio (0.39).

Data on building authorisations show how the statistics give only a partial view of the real situation. In 2003 Liguria, Campania and Sicilia appear as the regions with the lowest number of permissions for new dwellings and habitable sqm (3.3 dwellings and 244 square meters, 5 and 457 square meters, 6.3 and 576 square meters). In 2009 Liguria maintains the leadership for both indicators, Campania remains in the leader group while Sicilia lose 4 positions.

Table 2.15. The settlement capital in the Italian regions (standardized variables, average value 2002-2003-2004)

	Population density (40)	Permits to build new habitations in new residential edifices (41)	Permits to build new residential edifices (42)	Number of new residential edifices every 100 sq. km (43)	Settlement capital (synthetic index)
PIEMONTE	0.00	0.27	0.30	0.26	0.79
VALLE D'AOSTA	0.55	0.37	0.35	0.01	0.68
LOMBARDIA	0.84	0.62	0.59	0.94	0.25
LIGURIA	0.45	0.00	0.00	0.28	0.82
TRENTINO-A. A.	0.41	0.79	0.84	0.18	0.45
VENETO	0.28	1.00	1.00	1.00	0.18
FRIULI-VENEZIA GIULIA	0.07	0.67	0.71	0.52	0.51
EMILIA-ROMAGNA	0.00	0.84	0.78	0.50	0.47
TOSCANA	0.06	0.33	0.33	0.18	0.77
UMBRIA	0.29	0.39	0.48	0.12	0.68
MARCHE	0.06	0.67	0.69	0.33	0.56
LAZIO	0.49	0.36	0.32	0.44	0.60
ABRUZZO	0.21	0.63	0.72	0.33	0.53
MOLISE	0.40	0.42	0.57	0.10	0.63
CAMPANIA	1.00	0.11	0.19	0.49	0.55
PUGLIA	0.10	0.38	0.50	0.40	0.65
BASICATICA	0.46	0.21	0.32	0.00	0.75
CALABRIA	0.15	0.35	0.47	0.27	0.69
SICILIA	0.04	0.19	0.29	0.33	0.79
SARDEGNA	0.42	0.68	0.71	0.21	0.49

Source: own elaborations on Istat data

These numbers, however, especially for the regions considered most "virtuous", seem to ignore the traditional trend of illegal building activities in the Southern regions (please see, by way of example, the Legambiente "Ecomafia Report" 2011) and the recent illegal vocation of Liguria, which is the region of North Italy with the highest number of offenses in the field of cement ("Cemento Spa" Report 2012, Legambiente).

Veneto and Lombardia are the regions with the highest number of new buildings. In 2003, Veneto is at bottom of ranking, with 35 new buildings every 100 sq. km, followed by Lombardia (33 buildings). In 2009, all regions make a clean break in new concessions. Lombardia, however, slips to last place (18.4 new edifices every 100 sq. km).

Finally, it is necessary to add that this photograph of cement proliferation is confirmed by the last WWF-FAI Report 2012 "Consumption of Soil". Lombardia and Veneto are the more urbanized regions, with rates that exceed 10%, followed by Friuli-Venezia Giulia (region with the highest urbanisation per capita: 400 sqm / inh), Campania, Lazio and Emilia-Romagna.

Table 2.16. The settlement capital in the Italian regions (standardized variables, 2009)

	Population density (40)	Permits to build new habitations in new residential edifices (41)	Permits to build new residential edifices (42)	Number of new residential edifices every 100 sq. km (43)	Settlement capital (synthetic index)
PIEMONTE	0.00	0.38	0.34	0.36	0.73
VALLE D'AOSTA	0.58	0.56	0.41	0.05	0.60
LOMBARDIA	0.92	0.67	0.56	1.00	0.21
LIGURIA	0.45	0.00	0.00	0.55	0.75
TRENTINO-A. A.	0.42	1.00	1.00	0.26	0.33
VENETO	0.31	0.63	0.70	0.97	0.35
FRIULI-VENEZIA GIULIA	0.08	0.38	0.43	0.54	0.64
EMILIA-ROMAGNA	0.01	0.48	0.44	0.44	0.66
TOSCANA	0.06	0.25	0.21	0.21	0.82
UMBRIA	0.29	0.83	0.81	0.31	0.44
MARCHE	0.04	0.45	0.42	0.30	0.70
LAZIO	0.58	0.69	0.44	0.74	0.39
ABRUZZO	0.21	0.79	0.70	0.40	0.48
MOLISE	0.43	0.26	0.41	0.16	0.68
CAMPANIA	1.00	0.20	0.23	0.77	0.45
PUGLIA	0.08	0.56	0.57	0.64	0.54
BASILICATA	0.49	0.10	0.19	0.00	0.81
CALABRIA	0.18	0.41	0.52	0.37	0.63
SICILIA	0.02	0.29	0.36	0.61	0.68
SARDEGNA	0.45	0.64	0.54	0.24	0.53

Source: own elaborations on Istat data

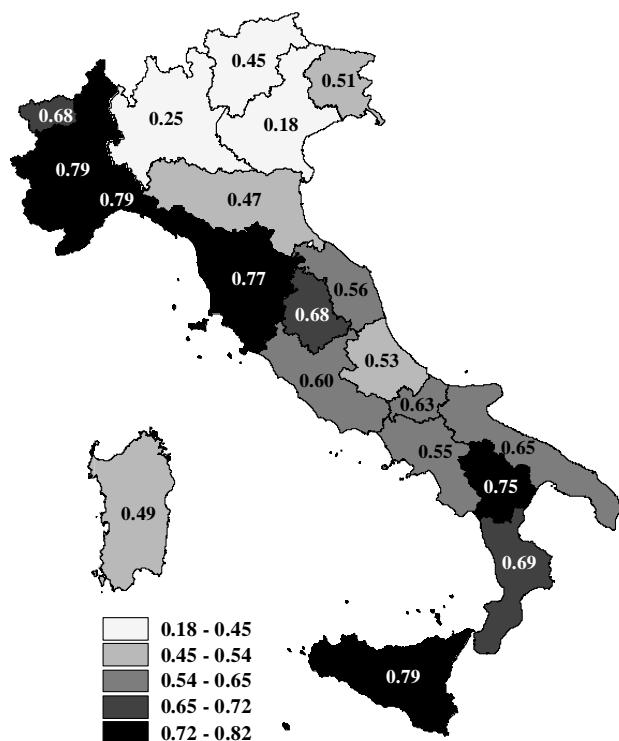
Note: In order to calculate the synthetic index, we used the one's complement of the standardized values of the variables included in the dashed box, whose contribution to the territorial capital is negative for higher values assumed by the variable. For the "population density", in dotted line box, standardization was performed on the

deviations from the mean (in absolute value) and its contribution to the territorial capital is considered to be negative. Further details are provided in the methodological annex.

Variables legend:

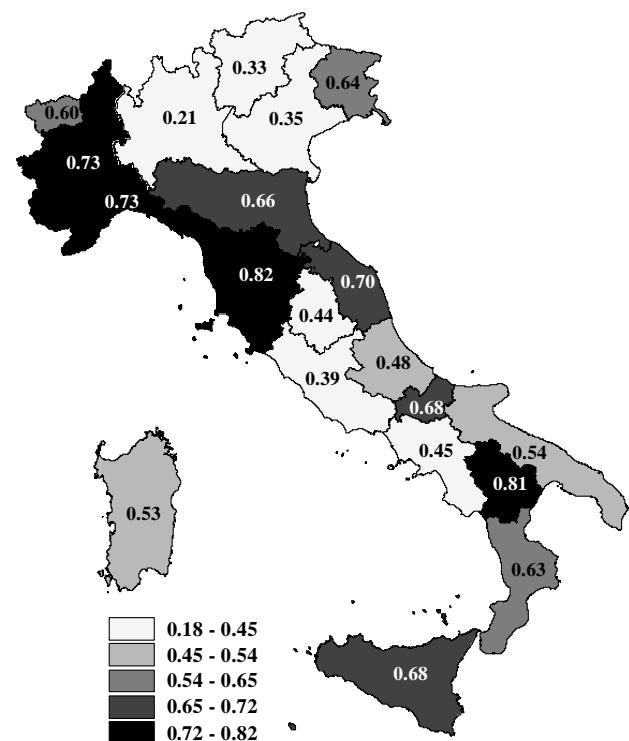
- (40) Total population density of communes: inhabitants/sq. km.
- (41) New habitations authorized: permits for habitations in new residential edifices, per 1000 households.
- (42) New habitable sq. meters authorized: permits for habitable sq. meters authorized in new residential edifices, per 1000 households.
- (43) Proliferation of new edifices: number of new edifices every 100 sq. km.

Figure 2.15. The settlement capital in the Italian regions (average value 2002-2003-2004)



Source: own elaborations on Istat data

Figure 2.16. The settlement capital in the Italian regions (2009)



Source: own elaborations on Istat data

3. A SYNTHETIC INDEX OF TERRITORIAL CAPITAL

The indexes of human cognitive, social, infrastructural, relational, productive, environmental and settlement capital of Italian regions were combined into a synthetic index of territorial capital. This is, by definition, a multidimensional concept which is composed by all the assets that constitute the wealth of a territory, as described in previous paragraphs. All the assets that are part of territorial capital are considered to be equally important, hence the synthetic index is computed as a simple average of the other indexes.

The average endowment of territorial capital of the Italian regions did not significantly change between 2003 and 2009, as a result of regional paths that are highly differentiated: half of the regions experienced a relative increase of their territorial capital (Emilia-Romagna, Friuli-Venezia Giulia, Toscana, Trentino-Alto Adige, Liguria, Veneto, Basilicata, Molise, Sardegna and Campania), whereas the others did not show any relevant change (Piemonte, Lazio and Puglia) or even showed a reduction of their territorial capital (Lombardia, Umbria, Valle d'Aosta, Abruzzo and Sicilia).

The presence of different groups of regions differently endowed with territorial capital and gradually increasing values from the South to the North of the country are structural characteristics (Figures 3.1 and 3.2). The eight Southern regions are the less rich of territorial capital both in 2003 and 2009 and the average gap with the Northern regions remained constant during the considered period. Among the Central regions, Toscana shows a good performance, being the third Italian region in terms of territorial capital endowment both in 2003 (0.63) and 2009 (0.64); region Marche improves its ranking by three places (from 0.55 in 2003 to 0.59 in 2009).

Emilia-Romagna is the richest region in territorial capital both in 2003 (0.66) and 2009 (0.69). The main contribution to the high territorial capital of this regions is from its human (0.89 in 2003 and 0.79 in 2009), social (0.81 and 0.79), productive (0.81 and 0.74), and cognitive (0.71 and 0.79) capital. The indexes relative to these dimensions show a reduction in the considered period, with the only exception of the one that measures the cognitive capital of the region, thus confirming the vocation of the regional productive system to innovation and of society to cultural activities. The increased endowment of territorial capital in 2009 is therefore mainly the result of an improvement with respect to those assets which the region is relatively less rich with (infrastructural, relational, environmental, settlement capital), although for some of these (e.g. the relational capital) Emilia-Romagna is one of the best performing regions.

The second region in the ranking for territorial capital in 2003 is Piemonte (0.63). The assets that contribute the most to this result are that of settlement (0.79), productive (0.75),

cognitive (0.70) and human (0.67) capital. Although the index of territorial capital of Piemonte is stable in 2009, the region loses some positions relatively to the top-performing regions. Also the contribution of the dimensions of territorial capital is different in 2009: the index relative to the cognitive capital increases up to 0.78, mainly thanks to a better performance of the region in R&D with respect to the other Italian regions, whereas the contribution of settlement (0.73), productive (0.68) and, above all, human (0.58) capital decrease, because of a drastic reduction of the rate of enrollment in upper secondary education, relatively to the other Italian regions.

In 2009, the second region in the ranking is Friuli-Venezia Giulia, with a synthetic index of territorial capital equal to 0.65. This region improves the position in the ranking by three position with respect to 2003, mainly because of a relevant increase of its level of cognitive capital (whose index goes from 0.66 to 0.87 between 2003 and 2009, thanks to improvements concerning all the variables that measure this asset), and social capital (which goes from 0.64 to 0.72, mainly because of higher levels of information, political debate and monetary contribution to associations).

Toscana occupies the third position in the ranking both in 2003 and 2009. The dimensions that have the most positive effect on the endowment of territorial capital of this region are those of human, residential, social and productive capital.

At the bottom of the ranking, we find Calabria (whose index of territorial capital is equal to 0.29 in 2003 and 0.30 in 2009), Campania (0.31 and 0.34) and Sicilia (0.32 and 0.28). Compared to the regions at the top of the ranking, these regions suffer low levels of cognitive and social capital, as a mark of a poor vocation to research and innovation and little participation and social cohesion.

In general, the dimension that has the greatest effect in lowering the values of the synthetic index of territorial capital for the Southern regions is that of cognitive capital. In the Central and Northern regions, instead, it is the environmental, relational and infrastructural capital that, on average, have the worst impact on the synthetic index of territorial capital. On the contrary, with respect to both years, on average the Central and Northern regions particularly benefit from their human, cognitive and social capital, while the territorial capital of Southern regions benefits mainly from the contribution of the settlement and human capital.

Table 3.1. The territorial capital in the Italian regions (average value 2002-2003-2004)

	Human capital	Cognitive capital	Social capital	Infrastructural capital	Productive capital	Relational capital	Environmental capital	Settlement capital	Territorial capital (synthetic index)
PIEMONTE	0.67	0.70	0.63	0.52	0.75	0.57	0.44	0.79	0.63
VALLE D'AOSTA	0.22	0.42	0.64	0.47	0.66	0.30	0.76	0.68	0.52
LOMBARDIA	0.63	0.67	0.71	0.69	0.75	0.69	0.53	0.25	0.62
LIGURIA	0.73	0.57	0.50	0.61	0.51	0.44	0.38	0.82	0.57
TRENTINO-A. A.	0.52	0.61	0.89	0.50	0.69	0.45	0.58	0.45	0.59
VENETO	0.68	0.57	0.73	0.55	0.77	0.55	0.44	0.18	0.56
FRIULI-VENEZIA GIULIA	0.86	0.66	0.64	0.66	0.52	0.49	0.50	0.51	0.60
EMILIA-ROMAGNA	0.89	0.71	0.81	0.50	0.80	0.66	0.48	0.47	0.66
TOSCANA	0.82	0.58	0.72	0.46	0.64	0.53	0.51	0.77	0.63
UMBRIA	0.87	0.40	0.55	0.34	0.56	0.27	0.50	0.68	0.52
MARCHE	0.81	0.38	0.57	0.44	0.72	0.36	0.53	0.56	0.55
LAZIO	0.82	0.72	0.41	0.61	0.50	0.40	0.34	0.60	0.55
ABRUZZO	0.73	0.34	0.43	0.46	0.61	0.41	0.55	0.53	0.51
MOLISE	0.58	0.07	0.38	0.42	0.55	0.16	0.43	0.63	0.40
CAMPANIA	0.48	0.18	0.06	0.46	0.38	0.23	0.17	0.55	0.31
PUGLIA	0.44	0.10	0.30	0.38	0.35	0.16	0.31	0.65	0.34
BASILICATA	0.52	0.12	0.34	0.34	0.50	0.34	0.52	0.75	0.43
CALABRIA	0.54	0.03	0.08	0.29	0.37	0.08	0.24	0.69	0.29
SICILIA	0.43	0.16	0.21	0.25	0.34	0.24	0.14	0.79	0.32
SARDEGNA	0.54	0.31	0.45	0.19	0.30	0.18	0.34	0.49	0.35

Source: own elaborations on Istat, Eurostat, Legambiente, Movimprese, Terna, Netval, Tidona Comunicazione data

Table 3.2. The territorial capital in the Italian regions (2009)

	Human capital	Cognitive capital	Social capital	Infrastructural capital	Productive capital	Relational capital	Environmental capital	Settlement capital	Territorial capital (synthetic index)
PIEMONTE	0.58	0.78	0.66	0.53	0.68	0.60	0.52	0.73	0.63
VALLE D'AOSTA	0.17	0.48	0.58	0.41	0.63	0.25	0.78	0.60	0.49
LOMBARDIA	0.52	0.75	0.70	0.71	0.64	0.73	0.52	0.21	0.60
LIGURIA	0.61	0.62	0.64	0.67	0.51	0.43	0.43	0.75	0.58
TRENTINO-A. A.	0.55	0.80	0.88	0.47	0.64	0.45	0.69	0.33	0.60
VENETO	0.59	0.69	0.72	0.54	0.70	0.55	0.46	0.35	0.57
FRIULI-VENEZIA GIULIA	0.77	0.87	0.72	0.63	0.42	0.58	0.57	0.64	0.65
EMILIA-ROMAGNA	0.79	0.79	0.79	0.55	0.74	0.68	0.53	0.66	0.69
TOSCANA	0.75	0.60	0.71	0.50	0.64	0.54	0.53	0.82	0.64
UMBRIA	0.75	0.44	0.60	0.30	0.53	0.31	0.55	0.44	0.49
MARCHE	0.75	0.42	0.61	0.44	0.73	0.49	0.56	0.70	0.59
LAZIO	0.77	0.75	0.45	0.59	0.56	0.45	0.40	0.39	0.55
ABRUZZO	0.66	0.28	0.46	0.41	0.64	0.38	0.54	0.48	0.48
MOLISE	0.53	0.10	0.36	0.48	0.55	0.19	0.48	0.68	0.42
CAMPANIA	0.50	0.23	0.17	0.50	0.37	0.24	0.25	0.45	0.34
PUGLIA	0.51	0.13	0.22	0.37	0.31	0.29	0.33	0.54	0.34
BASILICATA	0.47	0.14	0.35	0.40	0.45	0.38	0.63	0.81	0.45
CALABRIA	0.53	0.04	0.13	0.34	0.30	0.13	0.27	0.63	0.30
SICILIA	0.36	0.16	0.21	0.25	0.25	0.21	0.15	0.68	0.28
SARDEGNA	0.48	0.32	0.50	0.20	0.25	0.29	0.56	0.53	0.39

Source: own elaborations on Istat, Eurostat, Legambiente, Movimprese, Terna, Netval, Tidona Comunicazione data

Figure 3.1. The territorial capital in the Italian regions (average value 2002-2003-2004)

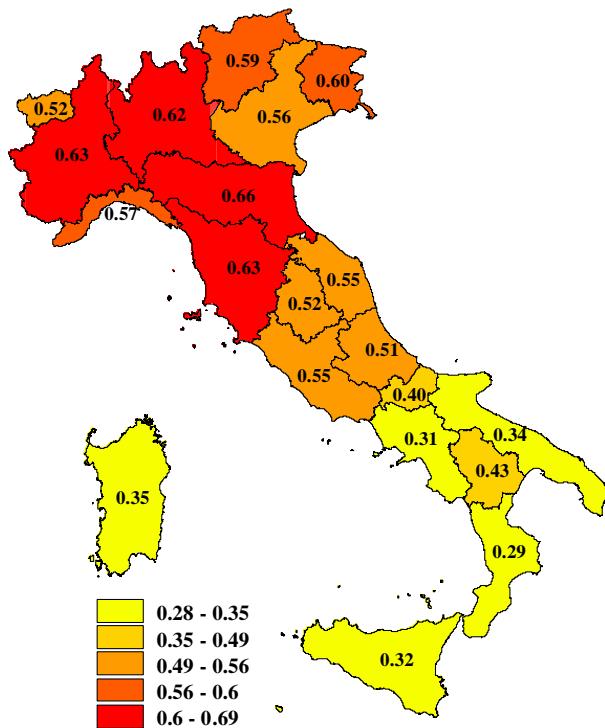
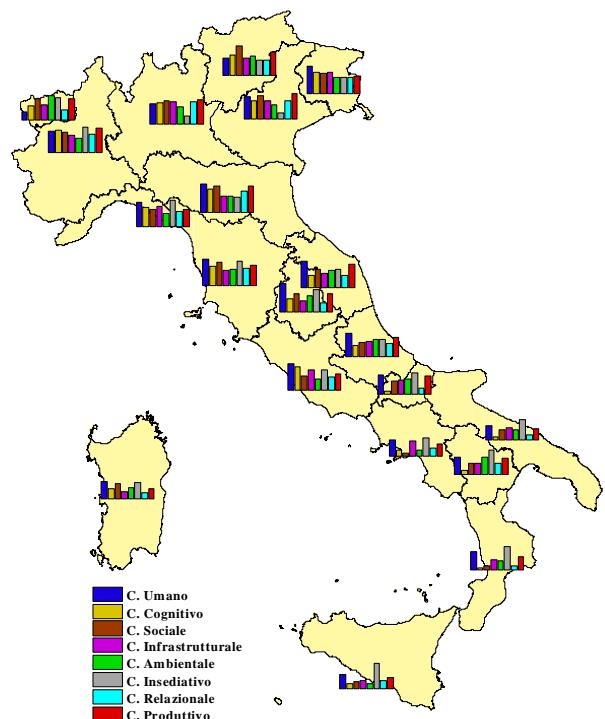


Figure 3.3. The territorial capital in the Italian regions (average value 2002-2003-2004)



Source: own elaborations on Istat, Eurostat, Legambiente, Movimprese, Terna, Netval, Tidona Comunicazione data

Figure 3.2. The territorial capital in the Italian regions (2009)

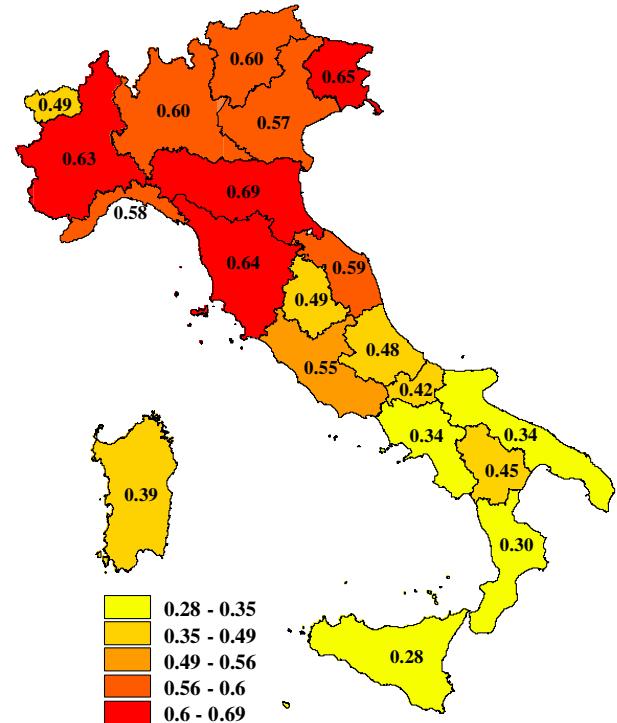
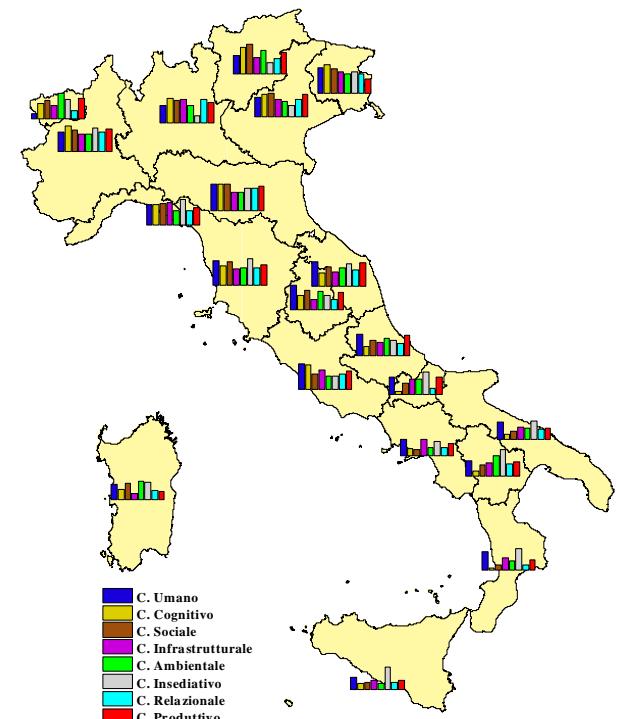


Figure 3.4. The territorial capital in the Italian regions (2009)



Source: own elaborations on Istat, Eurostat, Legambiente, Movimprese, Terna, Netval, Tidona Comunicazione data

4. CONCLUSIONS

“Each area has a specific capital - territorial capital - that is distinct from that of other areas (...)”, OECD (2001).

The above definition implies that the policy have to stimulate the increasing of the quantity of the territorial capital in the regions. The previous analysis clearly shows the patterns for the strategies of the Italian policy makers to start new strength local development.

The recent economic crisis have no reduced the quantity of territorial capital of the Italian regions in a relevant way. Some dimension, instead, show increasing values in 2003 and in 2009, especially the cognitive capital, environmental capital and infrastructural capital. The productive capital, in the regions specialised in the manufacturing production, and the human capital are the dimension more damaged by the crisis.

In 2009 synthetic index of territorial capital decreased in all Italian regions (except Marche, Abruzzo and Lazio regions). The regions specialised in manufacturing industry show the higher levels of the synthetic index: Emilia-Romagna, 0.74, Marche, 0.73, Veneto, 0.70, Piemonte, 0.68, followed by Lombardia, Abruzzo, Trentino-Alto Adige and Toscana (0.64). The synthetic index of Emilia-Romagna is the highest both in 2003 (0.89) and 2009 (0.79) although it is decreasing.

The quantity of territorial capital is not dualistic, in fact, it is progressively increasing by South to North of Italy. Some dimension of the territorial capital have also high values in the Southern regions, in particular the settlement and environmental dimensions, while, the human capital is more relevant in the Centre Italy and in Emilia Romagna region. Lazio has high values in the infrastructural capital and in the cognitive capital.

The geographical distribution of the dimensions of the territorial capital is gradual and it needs, for this reason, of different development policies. The territorial weakness are quantitatively and qualitatively different from Southern regions to Northern regions and the opportunities of development too.

5. METHODOLOGICAL ANNEX

Construction of the synthetic indexes for the eight dimensions of territorial capital

The choice of the representative variables for the different dimensions of territorial capital was strongly conditional on the availability and updating of regional data. The final dataset, composed by 43 variables, is organized as follows:

(1) Rate of enrollment in upper secondary education (2) Rate of early leavers from upper secondary education (3) Index of university attractiveness (4) Graduates in technical and scientific disciplines	Human Capital
(5) R&D personnel over 1000 inhabitants (6) Innovative capacity (7) Patent applications (8) Theatre and music performances (9) Book readers (10) Visitors of exhibitions and museums	Cognitive Capital
(11) Voluntary activity (12) People who donate to associations (13) Irregular full time equivalent units over total units (14) Frequency with which people enquire and discuss about politics (15) Number of environmental crimes	Social Capital
(16) People who travel with bus, trolley bus and tram who are satisfied with the frequency of rides (17) People who travel with couch and are satisfied with the frequency of (18) Degree of satisfaction of the train service (19) Index of utilization of train services (20) Utilization of public transports (21) Motorway network (22) Active railway (23) People flying on national and international flights	Infrastructural Capital
(24) Index of entrepreneurship (25) Labour productivity in industry (excluding construction) (26) Employees in industry over the total employees (27) Industrial energy intensity	Productive Capital
(28) Export capacity (29) Degree of openness (30) Export capacity of sectors with a dynamic demand in the world market (31) Banking office coverage index (32) Number of active Spin-offs	Relational Capital
(33) Air quality (34) Environmental protection expenditure (35) Green public spaces availability (36) Use of plant protection products in agriculture (37) Municipal waste sorting (38) Irregularities in water distribution system (39) Interruption of the electrical service	Environmental Capital
(40) Total population density of communes (41) New habitations authorized (42) New habitable sq. meters authorized (43) Proliferation of new edifices	Settlement Capital

The synthetic indexes related to the eight dimensions of territorial capital were calculated for all the 20 Italian regions. The analysis was conducted on the data available for 2003 and 2009. Data for year 2003 were calculated as the average for the period 2002-2003-2004 for all considered variables.

The standardization method applied to each variable X is:

$$X = \frac{X_{region} - X_{min}}{X_{max} - X_{min}}$$

Value 1 therefore is associated to the region with the highest level of variable X and value 0 to that with the lowest level of the same variable. This standardization method allowed us to make interregional and inter-dimensional comparative analysis.

For each dimension, the synthetic indexes were calculated as a simple arithmetic average of the standardized values of the representative variables of each dimension. In order to calculate the synthetic index, for those variables whose contribution to territorial capital is negative for higher values, the one's complement of the standardized values of the variables was used.

For the “population density”, the standardization was done on the variable taken in deviations from the mean (in absolute value). In order to calculate the synthetic index for settlement capital, the one's complement of the standardized values was used in order to account for the negative effect of extreme values.

The synthetic index of territorial capital for each Italian region was calculated as the simple arithmetic average of the synthetic indexes identified for the eight dimensions.

REFERENCES

- Bertini S., Brasili C. (eds.), (2011), *Sviluppo Locale*, Laboratorio Urbano, Centro di documentazione, ricerca e proposta sulle città, www.laboratoriourbano.info;
- Bonora P., Vitali W., Baccolini R., Guadagno G., Nerozzi B., Piccinini M., Rocchi P. G. (eds.), (2011), *Proposte per il governo del territorio*, Laboratorio Urbano, Centro di documentazione, ricerca e proposta sulle città, www.laboratoriourbano.info;
- Bonora P., Camagni R., Gibelli M. C., (eds.), proceedings of the seminar "Il territorio come bene comune: regole semplici e politiche integrate per un uso sostenibile e avveduto", Bologna 15 aprile 2011;
- Camagni R., (ed.) (1991), "Innovation Networks: Spatial Perspectives", Belhaven-Pinter, London;
- Camagni R., Travisi C., (2006), "L'insostenibilità dello sprawl urbano: un'analisi dell'impatto della mobilità in Italia", Franco Angeli;
- Camagni R., (2009), *Per un concetto di capitale territoriale*, in Borri D., Ferlaino F., (eds.), "Crescita e sviluppo regionale: strumenti, sistemi, azioni", Franco Angeli;
- Camagni R., Dotti N. (2010), *Il sistema urbano*, in Perulli P. e Pichierri A. (eds.), "La crisi italiana nel mondo globale, Economia e società del nord", Einaudi;
- Ciapetti L. (2010) "Lo sviluppo locale", il Mulino, Universale Paperbacks;
- De Blasio G., Sestito P. (eds.), (2011), "Che cos'è il capitale sociale?", Donzelli Editore, Roma;
- European Commission, *Territorial state and perspectives of the European Union, Scoping document and summary of political messages*, May 2005;
- Finance Department and Agenzia del Territorio in collaborazione con SOGEI, "Gli immobili in Italia", 2010;
- ISTAT, "Rapporto Annuale. La situazione del Paese nel 2008", 2008;
- Legambiente, "Dossier Cemento", 2012;
- Legambiente, "Rapporto Annuale Ecomafia", 1994-2011;
- MIUR, "La bussola di riferimento del PON Istruzione", 2011;
- OECD, "Territorial Outlook", 2001;
- Putnam R. D., (1993), "Making Democracy Work: Civic Traditions in Modern Italy", Princeton University Press;

- Regione Emilia-Romagna (2010), “Piano Territoriale Regionale. La Regione Sistema: il capitale territoriale e le reti”;
- Sen A. K. (1990), *Development as Capability Expansion*, in Griffin K. e Knight J. (eds.), “Human Development and International Development Strategy for the 1990s”, London, Macmillan, pp.41-58;
- Sen A. K. (1999), “Development as freedom”, Oxford, Oxford University Press;
- Tidona Comunicazione (1999), “Numero di Banche in Italia negli anni 1998-2009”;
- World Commission on Environment and Development, United Nations (1987), “Our Common Future” (Brundtland report);
- WWF e Fondo Ambiente Italia (2012), “Dossier Terra rubata”;

WEBSITES AND DATABASES

- www.apat.it
- www.autorita.energia.it
- <http://epp.eurostat.ec.europa.eu/>
- www.istat.it
- Banche dati Istat consultate:
- Indata
- Indicatori territoriali per le politiche di sviluppo
- I.Stat
- Noi Italia
- Sistema di indicatori territoriali
- www.infocamere.it/movimprese
- www.legambiente.it
- www.netval.it
- www.terna.it