Relationships between Social Capital and regional development in Europe:
a close examination

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ABSTRACT

The study of the Social Capital and its relationships with the development is a topical subject. The theme has not an exactly definition yet.

Some proofs at national and regional levels in Europe show interactions between the Social Capital and the economic growth and the labour market. From them, the paper aims to analyze these results, trying to specify the significances.

Applying the Principal Components Analysis to several interesting single variables (coming from the European Values Survey database), some macro-variables were created and inserted in regressions, producing partial results. These macro-components summarize the elements of the Social Capital and they are broken down as single variables.

A benchmarking between subjective variables and quantitative ones is realized to explain the concept of the Social Capital, with the aim of consider the individual and collective insight and the concrete effects of this multi-dimensional idea.

To fulfill the analysis, a remark is faced on the relationships between the Social Capital and the development, as the causality between them deserves further examinations.

Introduction

Within the past few decades, the notion and effects of Social Capital have been the subject of numerous theoretical discussions and empirical studies. The concept is known for its characteristic of multidimensionality, which does not allow for a precise definition.

This paper has the aim of seeking the presence of the Social Capital in the European countries and regions, after a study of the background literature and of the research joining to it.

The methodology used is called "Principal Components Analysis", and it has been applied on the results of a survey involving a sample of European citizens, interviewed on values and intangible features of daily and social life (European Values Survey). The results are macro-variables which summarize the features of Social Capital (values, relationships, cooperation, …).

The broad question of measurement of the concept is faced, including statistical and economic analysis of the relationships between Social Capital and the diverse dimensions of sustainable development, both at national and regional level in Europe.

1. A review of the literature and theories of Social Capital

The initial idea concerned good feelings, advantageous for individuals and communities (Hanifan, 1916; Jacobs, 1961). The first precise definition of Social Capital occurs in 1986, as the personal advantages obtained from belonging to a group (Bourdieu, 1986) and it was underlined the role of social networks on the status of the individual (in particular with reference to the mechanisms of professional inclusion – Loury, 1977). During the early 1990's, there were other definitions, indentifying the Social Capital as a resource which resides in the structure of social relationships (Coleman, 1990), as the concept of "association" (Putnam et al., 1993), as the "social networks which make available resources both cognitive (information) and normative (trust), which allow the actors to realize objectives otherwise unreachable, or reachable only at a very high cost" (Trigilia, 1998). In the same years, the concept of trust and the sharing of collective value systems born (Fukuyama, 1996; Mutti, 1998; Woolcock, 2000). The World Bank and the OECD (2001) define the concept consisting of the values, norms, relationships, and institutions which form the social interactions and which favour the action, facilitating cooperation.

As seen from the definitions, a few elements emerge which constitute the base of Social Capital:

1) relationships: at the micro-level, they have informal and horizontal nature (Putnam); at intermediate level (Coleman), dealing with the vertical associations between individuals, characterized by hierarchical relationships; to all this must be added the political and social environments (the macro-level), within which is formed the general social structure. The

coexistence of these three dimensions allows Social Capital to produce effects on both economic and social results;

2) trust, as the expectation of correct behaviour and of a credible obligation, which allows one to amplify cooperation from the interpersonal level to more articulated ones, and it is a product of reputation, which one solidifies with time;

3) institutions, as habitual forms of organizations, represented by political, economic, social, and educational bodies of society (Neo-institutionalist approach – Stiglitz, 2000, and Williamson);

4) territory: in the current context of globalization, competitiveness must be seen among territories as a whole. From this, the idea of "territorial capital" (Camagni e Capello, 2002) emerges as the set of all the characteristics which guarantee a competitive advantage for a territory (OECD).

The concept of Social Capital still has not found a unanimously accepted definition (Rizzi, 2003).

Social Capital shows two forms: cognitive and structural ones (Uphoff, 2000); and it can be measured on two levels (Bagnasco, 2001): "relationship/interactive" and "systematic/cultural" ones (recalling the distinction, developed by Putnam, Leonardi e Nanetti (1993), between "Bonding Social Capital" and "Bridging Social Capital").

The breadth of the concept could weaken its significance, but specific methods and indicators, suited for the particular meaning being considered, can produce solid and verifiable results (Grootaert e Van Bastelaer, 2002).

The range of disciplines involved is ample (Putnam, 2004), but the primary contributions come from Sociology, which analyses its constructions and characteristics, and from Economics, which evaluates its effects on the economic growth and well-being of the individuals. Many authors have indicated reciprocal influences between the two approaches (Coleman, 2000).

The use of the term "capital" has also received strong criticism (among others, Solow – 1995). In response to such criticisms it is possible to say that Social Capital is an essential complement to the other concepts of capital. Social Capital represents the "social" factors that complete the traditional productive factors.

As far as effects are concerned, Social Capital produces positive ones in politics (in terms of participation and functionality), on economic activity (with the reduction of transaction costs and strengthening of cooperation and development), and on social well-being (facilitating cohesion and improving quality of life), all direct results of access to and use of Social Capital (Castiglione et al., 2008). However, it can also produce negative effects: relationships are used up quickly, are expensive, and unsure; trust implies risk; one may encounter social exclusion or the creation of groups with illegal interests.

During the 1980's, new avenues of research were developed (Pianta, 2010). Attention was no longer focused only on pure quantitative variables, but rather methods and structures were explored which allow the measurement of behaviours in their complexity.

2. The measurement of Social Capital and the relationships with development

The measurement is subject to problems (Ciani, 2005), in particular the risk of banality of the concept, the use of sample surveys based on interviews, and the scarce attention paid to the context (Garofalo e Sabatini 2008). The conditions for a correct measurement therefore come from the specification of dimensions (Narayan e Pritchett, 2000) and involved components (Beugelsdijk e Smulders, 2009) and from the combinations of quantitative and qualitative instruments (Grootaert e Van Bastelaer, 2002).

Evidence in support of the positive relationship between Social Capital and economic growth is therefore relatively consolidated, even if the causality of the relationships and the effects are, in certain cases, ambiguous[1]. Significant and positive effects of Social Capital on economic growth can also be seen in various studies: Krishna and Uphoff (1999), Inglehart (2000), Panebianco (2003), Beugelsdijk and Van Schaik (2004), Andriani and Karyampas (2008).

The presence of trust reduces the risk of opportunistic behaviours, lowers the cost of transactions, favours exchanges, and stimulates investments and production, positively influencing the process of development. However, La Porta and other authors (2000) verify that the positive relationship between Social Capital and economic growth is true only for developing countries. It is here that the public role must be largely active because it is impossible to think of confronting the problems of poverty and inequity without public intervention.

Within the relationship between Social Capital and growth, however, it can also be very important to analyse sustainable development not only from the point of view of economic growth. The logic of sustainable growth and its dimensions has received more and more attention within the last few years, and is measured by separate indicators and by composite indices, made up of various elementary indices (Stiglitz, Sen, Fitoussi Commission, 2009).

3. An empirical study of the countries and regions of Europe

This paper seeks to define a new measurement of Social Capital in the countries and regions of Europe and to analyse the effects of Social Capital on a number of elementary variables stemming from the three dimensions of sustainable growth.

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[1] Among others, see the studies of Rizzi and Popara (2006) on the Italian provinces, and Rizzi (2004) and Righi and Turi (2007) on the Italian regions.

The method of analysis[2] utilized was constructed in various rounds, realized first at the national levels and then at the regional level. The rounds can be summarized as such:

- choice of variables tied to the concept of Social Capital: calculation of the frequency of the selected questions, study of the correlations between the individual variables[3];

- synthesis of the variables of departure relating to Social Capital in a few principal components;

- study of the potential relationships between Social Capital, and its components, and some objective variables relating to the dimensions of sustainable development, utilizing the Ordinary Least Square Estimator.

The variables of Social Capital, despite being made up of subjective responses, constitute an example of measurement of its own components, showing the properties of values, trust and relationships that one develops over time. The European societies have a common cultural base, but the differences stay strong, in particular there is a "traditional trend" against a "self-government one" (Galland e Lemel, 2007): the importance of values depends from the single development models.

Observing the Principal Components Analysis results for the countries, one notes that the original variables associate with the extracted components according to a precise logic, or rather:

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[2] The method of analysis is based on a sample study which was conducted within the scope of the "European Values Study" project, including around 40,000 individuals between 1991 and 2001. The data is available through the "GESIS Data" archive for the Social Sciences, located in Colonia (also available on-line via ZACAT, the data portal of the Social Sciences). The collections deal with values, ideas, attitudes, beliefs, opinions, and preferences of the citizens.

As to the merit of the object sample of the survey, one should note that the questionnaire involved covered various countries, including those outside of Europe. The three years of the survey (1981, 1990 and 1999) at the European level, in fact, were integrated with the four years of the World Values Survey, conducted in 1981-1984, 1980-1993, 1989-1993, and 199-2004. The present study focuses on the participants from the European nations. The sample, therefore, comprises nearly 30,000 interviewees from 26 nations which today are part of the European Union. With regard to the official and current composition of the EU, Cyprus was not included in the analysis since it did not participate in the survey. With the exception of Greece, the survey was performed by professional organizations, utilizing the direct interview method, completed by adults older than 18 years of age. The year of reference is 1999, with a small percentage of responses coming from the 2000 and 2001 surveys.

In the following analysis, the information relative to the sample derives from the European Values Survey questionnaire [EUROPEAN VALUES SURVEYS THIRD WAVE DATA FILE, 1999-2000 (2006)], while the source of objective data relative to the countries and regions of Europe comes from Eurostat.

The analysis at the level of the European regions is developed to take into account the territorial context in which every individual resides. The number of areas considered was 187: this includes both regions (level: NUTS 2) and macro-regions (level: NUTS 1).

Relative to the choice of Social Capital variables to be considered, the method of analysis is the same as used for the nations.

[3] After the selection of the variables and calculation of the associated frequencies, the study moves to the analysis of the bi-variable correlation[3] between the selected variables: on the basis of the results, both the strongly correlated variables (correlation value > 0.80) and the scarcely correlated variables (correlation value < 0.30) were eliminated. However, in the end, it was deemed opportune to retain a few variables which between them did not show a correlation condition greater than 0.30, in order to maintain their informative content, useful to the objective focus of the present study. f the original 61 variables, 18 were selected and utilized in the study.

The Principal Components Analysis (PCA) (Zani, 2000; Tabanichnick e Fidell, 2001; Jolliffe, 2002) allows a reduction of the dimension of a collection of variables, substituting new variables (Principal Components) for the departed variables. These new variables[3], which can be qualified as "latent variables," represent a synthetic measurement of Social Capital. o that the PCA could be followed, the Bartlett test must be verified: the null hypothesis foresees that the variables are independent. In this case one rejects the null hypothesis, with a significance of 1%: the variables are therefore not independent. The KMO index deals with the partial correlation and is measured via several values: 0.90 - optimal, 0.80 - good, 0.70 - discreet, 0.60 - mediocre, 0.50 - sufficient, less than 0.50 - insufficient. In the cases in question, the index shows a result between mediocre and discreet. The cumulative quota of total variance explained by the extracted components is equal to 68.28% for the countries and 58% for the regions.

1) Component 1 represents the Relationship Capital in and of itself, coming from the importance of the interactions, the belonging to social networks, and the trust in others;

2) Component 2 shows the Normative Capital, consisting of personal values and the values that govern the relationships with institutions, and ethical and civic norms that govern daily life;

3) Component 3 referred to as Cooperative Capital, shows the existence of an active dimension useful to the cultivation of processes of cooperation.

Table 1 - ROTATED COMPONENT MATRIX

Variables	COUNTRIES			REGIONS			
	Comp. 1	Comp. 2	Comp. 3	Comp. 1	Comp. 2	Comp. 3	Comp. 4
Very important in life: work	-0.718	0.296	0.125	0.7379	-0.2163	-0.0963	-0.1671
Very important in life: family	0.082	0.755	0.405	0.5663	0.1406	0.1886	0.1945
Very important in life: religion	-0.473	0.625	0.386	0.7591	-0.0672	0.0516	-0.1041
Availability to an increase in taxes useful in the prevention of environmental pollution	0.468	0.233	0.495	0.3096	0.5633	-0.0517	0.2331
Not justifiable behaviour: cheating on tax if there is the chance	-0.188	0.658	-0.151	0.1680	-0.0348	0.3704	-0.4503
Not justifiable behaviour: throwing away litter in a public place	-0.485	0.382	-0.150	0.4290	-0.1275	-0.1589	-0.2973
Very important in life: friends	0.870	0.200	0.184	-0.3436	0.6228	0.2867	0.3498
Membership in a religious organization	0.749	0.067	0.235	-0.1435	0.8385	-0.0224	-0.0703
Membership in cultural organizations	0.723	-0.163	0.418	-0.2583	0.7007	-0.0992	0.3057
Volunteer in a social services organization	0.640	-0.004	0.670	-0.1407	0.3072	-0.1174	0.7172
Active participation in political party/group (non-reimbursed work)	0.163	0.004	0.808	0.2371	0.3262	-0.3178	0.1682
Volunteer in an environmental organization	0.308	-0.145	0.773	0.0263	0.0889	-0.1022	0.8983
Trust in others (in the majority of people)	0.911	-0.003	-0.028	-0.4963	0.7172	0.0059	-0.1228
A great deal of confidence in institutions: education system	-0.087	0.781	-0.151	0.5857	0.0149	0.3782	-0.1485
A great deal of confidence in institutions: national parliament	0.175	0.824	-0.006	0.0890	0.0397	0.8625	-0.0799
A great deal of confidence in institutions: European Union	-0.505	0.638	0.246	0.3216	-0.2230	0.5376	-0.0908
A great deal of confidence in institutions: justice system	0.354	0.784	-0.217	0.0808	0.0516	0.8498	-0.0278
National pride (Response: "very proud")	-0.107	0.788	0.039	0.6979	-0.1236	0.1397	0.0885

Extraction Method: Principal Component Analysis. Rotation Method: Quartimax with Kaiser Normalization.

For the regions, one notes the performance of the three components already seen at the national level, with one additional specification:

1) Component 1 is the Value Capital, made up of personal values and values tied to the institutions closest to the individual (education system), and of ethical and civic norms for daily life;

2) Component 2 represents the Relationship Capital in and of itself, coming from the importance of the interactions, the belonging to social networks, and the trust in others;

3) Component 3, here named "Institutional Capital" (which, at the national level was associated with component 1 "Value Capital" in the national component "Normative Capital"), expresses the values which tie the individuals to the institutions of society;

4) Component 4 is the Cooperative Capital, that is to say the existence of an active dimension useful to the establishment of processes of cooperation.

The denominations of the different types of Social Capital are a choice coming from the examination of the literature and from a need of a simplification in the recognition of its elements.

3.1 Social Capital in European countries

Now it is possible to verify a ranking of the European countries, thanks to the scores related to the extracted components.

Table 2 – The ranking of the European countries in terms of Social Capital

	Comp. 1 – **Relationship Capital**				Comp. 2 – **Normative Capital**				Comp. 3 – **Cooperative Capital**	
		Paesi	Punteggi			Paesi	Punteggi			Paesi	Punteggi
1	SE	Sweden	2,365	1	MT	Malta	2,147	1	GR	Greece	2,909
2	NL	Netherlands	1,744	2	IR	Ireland	1,798	2	MT	Malta	1,47
3	DK	Denmark	1,661	3	PL	Poland	1,638	3	SK	Slovakia	1,412
4	FI	Finland	1,64	4	AT	Austria	0,909	4	SE	Sweden	1,297
5	UK	United Kingdom	0,991	5	RO	Romania	0,634	5	BE	Belgium	0,905
6	IR	Ireland	0,66	6	DK	Denmark	0,517	6	LU	Luxembourg	0,634
7	AT	Austria	0,415	7	ES	Spain	0,438	7	IT	Italy	0,576
8	LU	Luxembourg	0,321	8	SL	Slovenia	0,43	8	NL	Netherlands	0,529
9	DE	Germany	0,317	9	LU	Luxembourg	0,412	9	CZ	Czech Republic	0,381
10	ES	Spain	0,159	10	IT	Italy	0,192	10	UK	United Kingdom	0,141
11	SL	Slovenia	0,032	11	BG	Bulgaria	0,174	11	BG	Bulgaria	-0,091
12	BE	Belgium	-0,187	12	PT	Portugal	0,11	12	RO	Romania	-0,238
13	GR	Greece	-0,212	13	FI	Finland	0,097	13	SL	Slovenia	-0,264
14	EE	Estonia	-0,302	14	UK	United Kingdom	0,056	14	AT	Austria	-0,335
15	CZ	Czech Republic	-0,349	15	HU	Hungary	0,022	15	FR	France	-0,447
16	FR	France	-0,45	16	SE	Sweden	-0,031	16	PT	Portugal	-0,477
17	HU	Hungary	-0,546	17	LV	Latvia	-0,379	17	PL	Poland	-0,508
18	BG	Bulgaria	-0,626	18	FR	France	-0,42	18	HU	Hungary	-0,508
19	IT	Italy	-0,631	19	BE	Belgium	-0,495	19	FI	Finland	-0,512
20	SK	Slovakia	-0,738	20	CZ	Czech Republic	-0,741	20	IR	Ireland	-0,627
21	PT	Portugal	-0,777	21	NL	Netherlands	-0,793	21	LT	Lithuania	-0,793
22	LV	Latvia	-0,801	22	SK	Slovakia	-0,795	22	ES	Spain	-0,858
23	PL	Poland	-0,845	23	DE	Germany	-0,932	23	DK	Denmark	-0,939
24	LT	Lithuania	-1,051	24	GR	Greece	-1,079	24	EE	Estonia	-0,976
25	RO	Romania	-1,333	25	EE	Estonia	-1,579	25	LV	Latvia	-1,165
26	MT	Malta	-1,458	26	LT	Lithuania	-2,331	26	DE	Germany	-1,517

For the Relationship Capital, the North countries, specifically Sweden, Netherlands, Denmark and Finland, are classified first. In these territories it seems that associations, in the form of passive

participation (membership) and trust in others, has great importance. Malta, Romania, Lithuania and other Southern and Eastern countries are in the final positions.

As to the Normative Capital, Malta, Ireland, Poland and Spain are the first countries in this ranking, thanks to a strong catholic tradition (over a good judgment of confidence in the institutions), against countries like Baltic Republics, Germany and Dutch.

The Cooperative Capital is strictly derived from Relationship Capital, and it does not seem to have a clear definition. The countries ranked higher show a greater active dimension of relationships, independently from economic levels, for which a more evident distinction appears in the two preceding cases. In fact, the highest ranked countries are Greece, Malta, and Slovakia, but also Sweden and Luxembourg, while the lowest ranked countries are Estonia and Latvia, but also Germany and Denmark.

For a further analysis on Social Capital, it follows a comparison between subjective variables and quantitative ones, to verify the reliability of the macro-variables resulting from the Principal Components Analysis.

To check the Relationship Capital, it was selected the number of people in prison[4] in 2000.

Table 3 - Relationship Capital and people in prison on population (for 100 inhabitants)
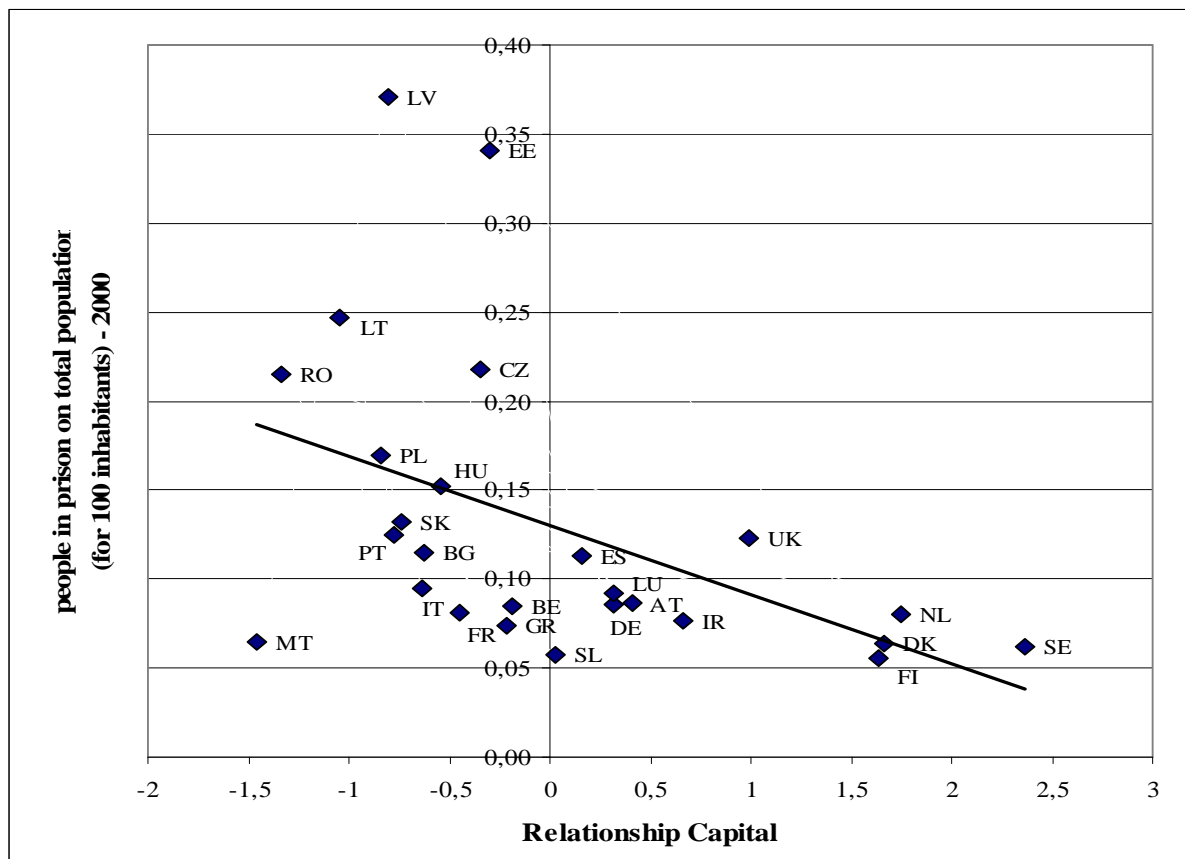
[4] Source data: Eurostat.

As we can see, there is a negative correlation between Relationship Capital and the number of people in prison. It seems that many relationships and more trust in others take to less crimes and the other way round.

For studying the Normative Capital, there is a compare with the participation to EU elections (%)[5] in 2004.

Table 4 - Normative Capital and participation to EU elections
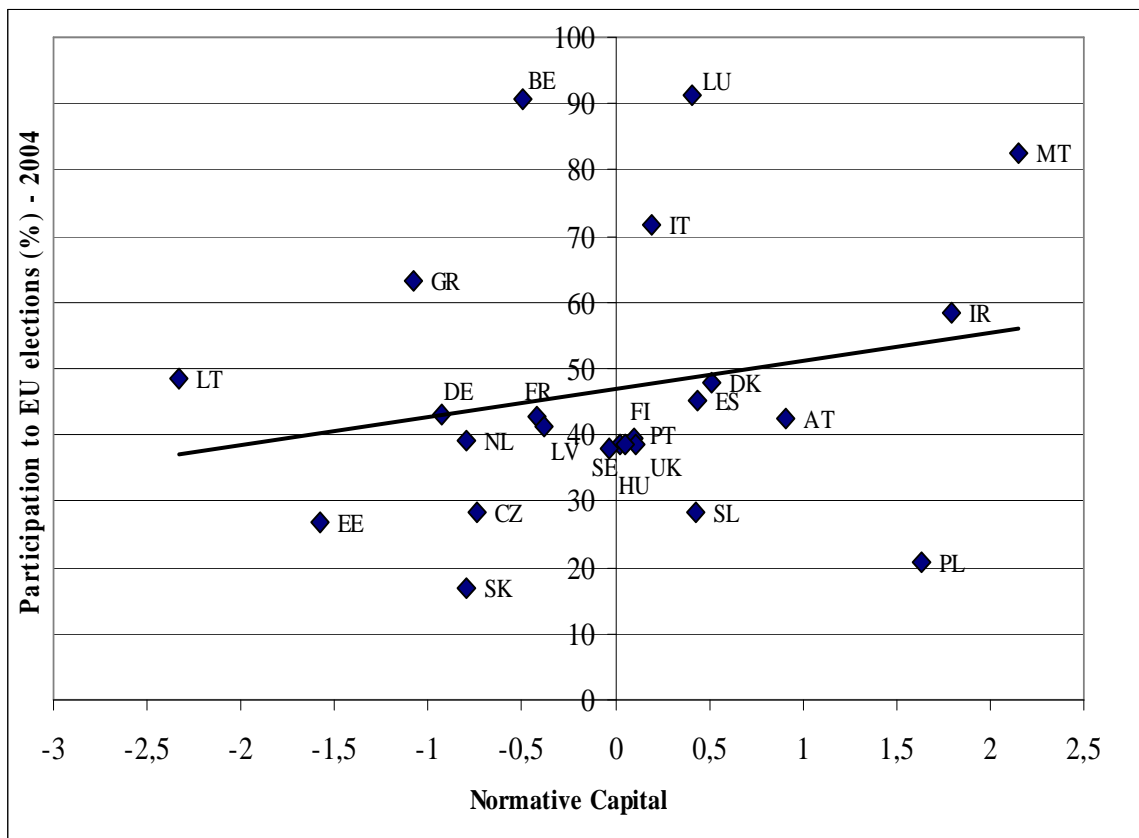
The Normative Capital is positively correlated to participation to EU elections[6]. It means that many voters turn out at an election, probably thanks to more trust in institutions and to the reference context.
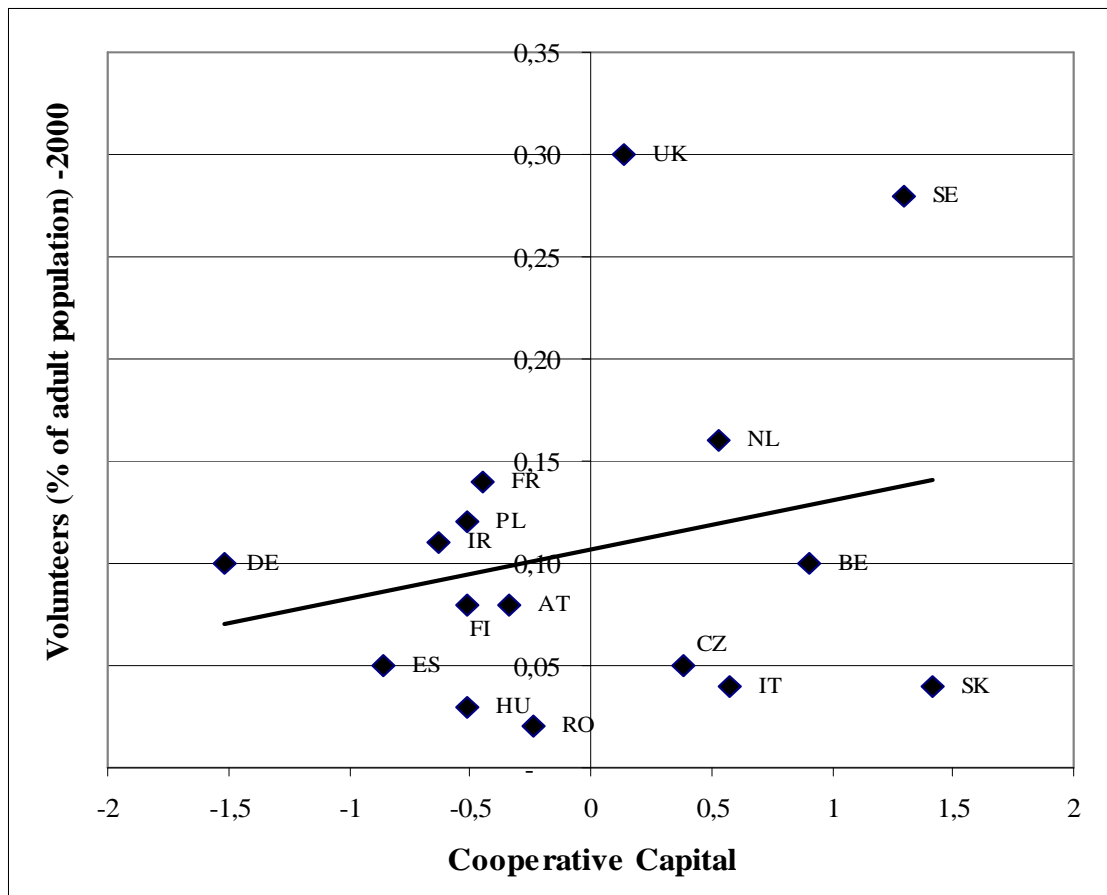
With reference to the Cooperative Capital, volunteers data[7] are available only for 16 European countries in 2000.

Table 5 – Cooperative Capital and % of volunteers on adult population

It is confirmed a positive link between the two types of same variable of Social Capital.

In this study, the measurement of Social Capital is associated to subjective-perception "oriented to values" variables (trust, norms, values, tendency to relationship).

The macro-variables resulted from the Principal Components Analysis are consistent with quantitative variables selected. It supports the choice of using these variables in the following analysis.

3.2 Social Capital in the European regions

It is now possible to draw up a ranking of the regions of Europe.

With reference to the Value Capital, as expected, one sees that the Southern regions and those of Eastern Europe, the more orientated toward religion (such as Italy and Poland), are ranked highest. Countries such as Germany and Netherlands find themselves instead at the bottom.

Considering the Relationship Capital, the Swedish regions and Dutch regions are ranked highest, while the regions in South-Eastern Europe are last. One can also see the presence of a few German regions towards the bottom (such as Saarland, Bayern, and Hamburg), which present, at the macro-region level, lower relationship values.

Table 6 – Ranking: European regions (Components 1 and 2)

Rank	Component 1 – Value Capital	score	Rank	Component 2 – Relationship Capital	score
1	ES La Rioja	2.66	1	SE Norr	3.5
2	MT Malta	2.48	2	SE Öst	3.32
3	IT Basilicata	2.16	3	SE Västsverige	3.27
4	PL Opolskie	2.13	4	SE Sydsverige	3.12
5	PL Pomorskie	2.01	5	SE Stor Stockholm	3.01
6	GR Chios	1,94	6	NL Drenthe	2,79
7	PL Dolnolslaskie	1,94	7	NL Utrecht	2,74
8	RO Nord-Est	1,94	8	NL Overijssel	2,46
9	PL Podlaskie	1,89	9	ES La Rioja	2,34
10	PL Swietokrzyskie	1,67	10	NL Groningen	2,19
178	DE Hessen	-1,61	178	RO Centru	-0,99
179	ES Cataluña	-1,7	179	PT Norte	-1,01
180	DE Brandenburg	-1,71	180	ES Galicia	-1,03
181	DE Baden-Württemberg	-1,75	181	DE Bayern	-1,09
182	NL Utrecht	-1,76	182	IT Umbria	-1,12
183	DE Mecklenburg-Vorpommern	-1.9	183	ES Cataluña	-1.14
184	DE Bayern	-1.95	184	EE Estonia	-1.22
185	DE Rheinland-Pfalz	-2.12	185	IT Molise	-1.42
186	DE Saarland	-2.2	186	LT Lithuania	-1.61
187	DE Hamburg	-3.87	187	DE Hamburg	-1.9

Observing the Institutional Capital, we see that at the top are the German, Spanish, and English regions.

For Cooperative Capital, as one can see from the table, the Greek, United Kingdom, and Italian regions occupy the top positions, while German, Dutch, and Eastern European regions are at the bottom.

One possible reflection is given by geographic positioning: decentralized regions, with respect to national governments, Cooperative Capital offsets the low values of Institutional Capital.

Table 6 bis – Ranking: European regions (Components 3 and 4)

Rank	Component 3 – Institutional Capital	score	Rank	Component 4 – Cooperative Capital	score
1	DE Saarland	5.8	1	GR Kerkyra	6.34
2	ES Comunidad Foral de N.	5.46	2	IT Valle d`Aosta	4.8
3	DE Rheinland-Pfalz	4.3	3	UK London	3.33
4	UK London	1.87	4	UK W. Mids	2.89
5	DE Nordrhein-Westfalen	1.78	5	UK South West	2.87
6	ES Castilla y León	1,67	6	UK North East	2,75
7	ES Andalucia	1,55	7	UK Eastern	2,72
8	IR Ireland	1,48	8	GR Chios	2,26
9	DK Nordjyllands amt	1,4	9	UK E. Mids	2,23
10	IT Abruzzo	1,4	10	GR Notio Aigaio	2,06
178	BE Prov. Namur	-1,23	178	NL Flevoland	-0,94
179	DE Schleswig-Holstein	-1,25	179	DE Hessen	-0,96
180	GR Notio Aigaio	-1,29	180	DE Sachsen	-0,99
181	DE Sachsen-Anhalt	-1,58	181	BG Severen tsentralen	-1
182	GR Peloponnisos	-1,63	182	PL Podlaskie	-1
183	IT Valle d`Aosta	-1.67	183	PL Podlaskie	-1
184	LT Lithuania	-1.68	184	DE Mecklenburg-Vor.	-1.03
185	BE Prov. Luxembourg	-1.73	185	IT Abruzzo	-1.08
186	GR Chios	-2.07	186	DE Hamburg	-1.22
187	ES La Rioja	-2.29	187	DE Brandenburg	-2

4. The relationship between Social Capital and development: an economic study

In order to evaluate the linkages between the individual components of Social Capital and a few selected variables with reference to the dimensions of sustainable development (growth of the GDP for economic dimension, unemployment rate for the social dimension, and emission of greenhouse gasses for the environmental dimension), the choice of these variables is due to the data availability on European national and regional levels.

For the economic dimension the growth rate of the GDP in European Countries from 2000 to 2008 is explained with the value of the GDP in the initial year, in order to verify the processes of convergence between countries, with the exports per capita, research and development costs and other diverse components of Social Capital (Pianta, 2010).

Table 7 – Regression on the economic dimension

Dependent Variable: growth rate of GDP 2000-2008

	REGR. 1	REGR. 2	REGR. 3
	Coeff.	Coeff.	Coeff.
(Constant)	181.927	262.611	724.342
Sig.	0.008	0.000	0.000
Ln real per-capita GDP 2000	-23.228	-24.737	-21.914
Sig.	0.043	0.000	0.000
Ln exports per-capita (PPS) 2000	10.708		
Sig.	0.065		
Ln R&D internal expenditure (public e private: GERD) - PPS per-capita at constant prices 2000, anno 2000	-5.504		
Sig.	0.564		
Component 1 - Relationship Capital		5.092	5.542
Sig.		0.181	0.204
Component 2 - Normative Capital		-5.610	
Sig.		0.050	
Component 3 - Cooperative Capital		-1.461	1.977
Sig.		0.586	0.466
Very important in life - work (ln)			7.792
Sig.			0.712
Very important in life - family (ln)			-117.889
Sig.			0.006
Very important in life - religion (ln)			1.035
Sig.			0.862
Characteristics Model R2	0.781	0.789	0.851
Adjusted R2	0.746	0.749	0.803
F Test Sig.	0.000	0.000	0.000

The data here is in cross-section, that is to say they influence more than one subject in the same temporal instant[8]; the dependent variable, however, was chosen with a successive temporal specification, in such a way as to verify the casual effects of the regressors on it. In this way, the problem of endogeneity of the regressors[9] has been mitigated.

The control variables of the model (GDP value of the initial year, the exports per capita, and research and development costs) turn out to be significant (with the exception of research and development) as expected.

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[8] The variables of Social Capital are from 1999 (and, in some cases, from 2000), while the other regressors are from 2000.

[9] Since the data is cross-section, the autocorrelation is negligible, the Durbin-Watson test to verify the autocorrelation of residuals is not considered. The Anova table, in every case, consents to affirm that the model is significant in its entirety, as far as it is possible to reject the null hypothesis according to which the "coefficients of the regressors considered are null". The choice of the regressors is confirmed also by VIF (Variance Inflation Factor). As far as the residuals, it is possible to say that not one of the standardized residuals surpasses the standard deviation in an absolute value of 3 times: therefore, no anomalous values, called "outliers" are present, that is observations that tend to deviate from the normal distribution of the data, and therefore present rather elevated residuals in regressive sequence. As for the normal distribution and the heteroskedasticity of the residuals, the questions were confronted using a logarithmic transformation for dependent variable and for regressors.

Inserting the variables of Social Capital, one observes the significance of the Normative Capital with a negative sign. One confirms this with the evidence from the responses: in fact, the countries with a lower valuation show greater growth. Also, one finds, at the level of individual variables, a potentially positive impact (but this is not supported by the evidence from the model) of the variable related to the importance of work. In fact, what shows up is that the countries with larger growth attribute a greater significance to this "concrete" value, with respect to the traditional values of family and religion.

The resulting data does not confirm all preceding studies that have shown favourable results for a positive impact of Social Capital on economic growth (Krishna and Uphoff, 1999; Inglehart, 2000; Panebianco, 2003; Beugelsdijk and Van Schaik, 2004; Andriani and Karyampas, 2008).

Turning to the analysis of the variables of social dimension (the unemployment rate is the dependent variable), the regression considered as independent variable: gross fixed investments per capita and the various components of Social Capital.

Table 8 – Regression on the social dimension

Dependant Variable: Unemployment Rate 2001

	REGR. 1	REGR. 2
	Coeff.	Coeff.
(Constant)	5.416	1.992
Sig.	0.000	0.000
Ln investments per capita (PPS, prices 2000) 2000	-0.436	
Sig.	0.000	
Component 1 - Relationship Capital		-0.313
Sig.		0.008
Component 2 - Normative Capital		-0.164
Sig.		0.140
Component 3 - Cooperative Capital		-0.024
Sig.		0.821
Characteristics Model		
R2	0.48	0.33
Adjusted R2	0.46	0.24
F Test Sig.	0.00	0.03

The control variable ("Investments") proves to be, as expected, significant.

Inserting the variables of Social Capital, one sees the significance and the negative sign of Relationship Capital (with an impact[10] of 0.31% on the unemployment rate). The evidence confirms

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[10] The logarithmic transformation of dependent variables and regressors consents to speak of elasticity, that is an increase of 1% of the independent variable generates a % increase of the value of the same coefficient of the dependent variable.

a relationship in which the countries with a propensity for relationships show a lower unemployment rate.

The evidence also seems to confirm the vein of study of the professional mechanisms of insertion facilitated by the relationship systems, as seen in Granovetter (1974) and in Networks View, and even earlier in the considerations of Loury (1977).

Finally, as for the environmental dimension, the dependent variable is the emission of greenhouse gasses, explained through electricity consumption, emission of acidic substances and the various components of Social Capital.

Table 9 – Regression on the environmental dimension

Dependent variable: Emission of greenhouse gasses 2001

	REGR. 1	REGR. 2	REGR. 3
	Coeff.	Coeff.	Coeff.
(Constant)	-0.145	0.021	0.820
Sig.	0.761	0.978	0.558
Ln electricity consumption (1.000 toe) 2000	0.475	0.439	0.426
Sig.	0.000	0.017	0.015
Ln emission of acidic substances (1.000 tonnes) 2000	0.500	0.531	0.541
Sig.	0.000	0.005	0.003
Component 1 - Relationship Capital		0.032	0.058
Sig.		0.780	0.617
Component 2 - Normative Capital		-0.052	-0.041
Sig.		0.507	0.611
Component 3 - Cooperative Capital		-0.017	
Sig.		0.839	
Availability to an increase in taxes useful in the prevention of environmental pollution (Ln)			-0.194
Sig.			0.528
Characteristics Model R2	0.942	0.944	0.945
Adjusted R2	0.937	0.930	0.931
F. Test Sig.	0.000	0.000	0.000

The control variables of the model prove significant, as expected. Inserting the variables of Social Capital, one sees a coherent sign, but no significance. In any case, one chooses to report the complete results of the analysis for dimensions of sustainable development.

To study the effects of Social Capital on European regions, it was realized only a regression of economic growth, due to lack of ulterior economic, social, and environmental data at the sub-national level for the years of interest.

As to the original 187 regions, only 170 regions are included in the analysis because the others set up anomalous values (outliers).

Table 11 – Regions: regression on the economic dimension

Dependent variable: growth rate of the GDP 2000-2007

	REGR. 1	REGR. 2
	Coeff.	Coeff.
(Constant)	199,856	234,131
Sig.	0,000	0,000
Ln real per capita GDP 2000	- 17,313	- 20,858
Sig.	0,000	0,000
Component 1 - Value Capital		- 2,088
Sig.		0,014
Component 2 - Relationship Capital		1,902
Sig.		0,016
Component 3 - Institutional Capital		1,600
Sig.		0,024
Component 4 - Cooperative Capital		- 0,157
Sig.		0,830
Characteristics Model		
R2	0,49	0,45
Adjusted R2	0,39	0,43
F Test Sig.	0,00	0,00

The control variable of the model (real per capita GDP 2000) is, as expected, negative, confirming the processes of convergence, and is significant.

After inserting the Social Capital variables one sees the significance and positivity of Institutional Capital (with an impact of 1.60% on the growth rate), and the significance and negativity of Value Capital (the effect already discussed at the national level is now divided into two components, one positive and one negative), and the significance and positivity of Relationship Capital (with an impact of 1.90% on the growth rate).

In this case one could confirm the theory of a positive link between Social Capital and economic growth (Krishna e Uphoff, 1999; Inglehart 2000; Panebianco, 2003; Beugelsdijk e Van Schaik, 2004; Andriani e Karyampas, 2008).

5. Conclusions

This study, after a review of the literature and orientations of research previously generated on the subject of Social Capital, has sought to isolate the presence of such in both the countries and regions of Europe, taking as a starting point the questionnaires administered to a significant sample of European citizens, on the values and immaterial aspects of economic and social life (European Value Survey).

Thanks to the Principal Components Analysis (PCA) it is possible to observe the presence of a few distinct dimensions of Social Capital, allowing a definition of positioning of the analysis units (European countries and regions), confirmed by the study of quantitative survey on specific variables.

In the attempt to operationalize the concept, a relatively innovative taxonomy emerged with respect to the existing literature, but related to the key concepts of the Social Capital theme.

At the national level one finds three components of Social Capital: Relationship Capital, representing the importance of interactions and membership in society, facilitated through trust in others; Normative Capital, that which is linked to personal values and those values seen in institutional relationships, also considering the ethical norms of social life; Cooperative Capital, which represents the active dimension of relationships and comes from voluntary experiences.

Relationship Capital is largely present in the Northern countries (such as Sweden and Netherlands) and less so in the Southern countries (such as Malta and Portugal) and Eastern countries (such as Romania and Lithuania); Normative Capital is found in recently developed areas (such as Ireland) and in new democracies (such as Poland), while it is less present in the East (Estonia, Latvia, Lithuania); Cooperative Capital, which represents the active component of Social Capital, is present, but indifferently so, in Greece, Slovakia, and Belgium, while it is scarcely present in the East, but also in Germany and Denmark.

At a regional level, there are four individual components of Social Capital: Value Capital, tied to history, tradition, culture, religion, and context; Relationship Capital, from which emerges the importance of social relationships; Institutional Capital, which expresses the values that link individuals to the institutions of society; Cooperative Capital, which signifies the existence of the active dimension of relationships.

For Value Capital, the Spanish region, La Rioja, is highest, while the lowest is Hamburg (Germany); for Relationship Capital, the Swedish regions are found at the top; Institutional Capital (which for the nations was a complement of Value Capital), is largely present in a few German regions; Cooperative Capital seems to be largely found in peripheral areas, both with respect to central governments and Europe in general, and less present in central areas.

Also verifying the presence of a possible effect of the determined components on sustainable development, it would seem that, at a national level, Normative Capital negatively affects economic growth, while Relationship Capital is negatively linked (in coherence with the theory) to the unemployment rate. As far as the environmental component, there is no significant evidence, but Cooperative Capital proves to be negatively linked with the emissions of greenhouse gasses.

When considering the regions, one sees a positive effect of Institutional Capital (very present in a few German regions) compensated by a negative impact of Value Capital (present in the Polish regions with more elevated values with respect to the others), and a positive effect of Relationship Capital (present in North regions).

One can therefore conclude, as the empirical test partially confirms the results of preceding empirical explorations for the positive relationship between Social Capital and economic growth (Krishna-Uphoff 1999, Inglehart 2000, Panebianco 2003, Beugelsdijk e Van Schaik 2004, Andriani e Karyampas 2008), for the positive relationship between Social Capital and access to the working world (Loury 1997, Granovetter 1974), within the scope of relative evidence of effects produced by Social Capital on the dimensions of sustainable development.

Further studies on the measurement techniques, both of Social Capital and sustainable development, will lead to new developments in the research and results which will be more precise and robust.

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