

MEASURING SOCIAL CAPITAL: EVIDENCE FROM ITALY

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1. Introduction

The concept of social capital has gained increasing attention in the social sciences, first in sociology, then in economics. With this a measurement issue has soon arisen, since empirical analysis needs a quantitative translation of this notion.

Any attempt at measurement is bound to draw criticism, both by sociologists, for the over-simplification of a situational and dynamic concept (Piselli, 2000), and by economists, mostly in relation with the use of the term 'capital' (see Solow, 1999).¹ Nevertheless, some acceptable measurement is needed for quantitative analysis of the relationship of this concept with economic variables.²

There are many definitions of social capital, which leads to further difficulty. This has been exacerbated by the different words used to refer to the concept. We keep an open attitude on this. We do not choose any specific definition, except that we rule out concepts linked to other forms of capital and formal institutions. The aim of the work is to clarify the concept as much as possible, by using an experimental approach and studying, on the basis of actual empirical data, the relations between the proxies used and the core of the concept itself.

In Italy, the concept of social capital has been widely used by the literature on industrial districts, in an attempt to explain the successful economic performance of small and medium firms in some areas

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¹ In favour of the use of the term 'social capital', some (e.g. Grooaert and van Bastelaer, 2002) argue that social capital has its own characteristics: it is relational and not an individual property; its use increases its value, contrary to other forms of capital. Moreover, as for other forms of capital, it is an accumulated stock whose creation requires time and effort

² This need has also been expressed by the World Bank, which has created a special programme on social capital. According to Serageldin (1999) "*The challenge of development agencies such as the World Bank is to operationalize the concept of social capital and to demonstrate how and how much it affects developments outcomes*".

(Bagnasco, 1977; Becattini, 2000). This explanation assumes that the endowment of social capital varies significantly across regions.

With a view to shedding light on the issues raised above, this paper has three main goals:

- a) finding the best proxies of social capital available at the local area level;
- b) defining the current geography of social capital endowment;³
- c) qualitatively studying the association of our synthetic measure of social capital with the economic phenomenon of interest, namely the distribution of industrial districts.

This paper is structured as follows. The second section provides a brief overview of the theoretical and empirical literature on social capital. Section 3 describes the proxies of social capital available at the local level in Italy. Section 4 shows the results of a principal component analysis, static and dynamic, at the regional level. Section 5 repeats the same analysis on a restricted set of proxies of social capital (i.e., only those that were found to have sufficient explanatory power in the previous analysis, and appeared to be most strictly linked to an intuitive notion of social capital). Section 6 removes the effects of different per capita incomes at the local level; in addition, an effort was made to extend this analysis by using a less rich database of social capital proxies, available at the provincial level. A summary of the results and suggestions for future research concludes.

2. A review of the literature

The idea of social capital has been used in a variety of ways in the recent economic literature. Each author focuses on different aspects. There are two main interpretations: social capital as an individual characteristic, and social capital at the community level.

³ Arrighetti *et al.* (2003) use the variables built by Putnam, which refer to the 1960s or 1970s, to construct a map of local territorial social capital distribution in Italy. This differs from the approach used here, since the focus of this paper is on the contemporary stock of social capital. In addition, nowadays the availability of indicators is much greater and therefore the two maps, although similar, may differ.

These two approaches, which originated respectively with Coleman (1988) and Bordieau (1980) and with Putnam (1993), stress different characteristics of the concept. While the “individual” concept of social capital underlines person-to-person interactions as a factor explaining economic behaviour, the “community” concept highlights the importance of generalized trust in society.

The first approach has stimulated research into the reasons for investing in social capital (Glaeser *et al.*, 2002). Other empirical research has analyzed in depth the consequences of networking. Individuals, as well as firms, have been considered. These empirical studies have difficulty in resolving the issue of the identification, owing to the presence of reverse-causation problems.

The literature on community-level social capital has its own considerable shortcomings. One concerns the aggregation of micro data (Durlauf, 2002). Cross-country analysis, which uses social capital as regressor, also suffers from identification problems, since the extent of social capital may be correlated with other aspects that are omitted in the model. Considering social capital at a community level means first of all concentrating on one of its two dimensions. Thus, the focus will be on trust rather than on social interactions.

A new approach has been proposed by Guiso *et al.* (2004), who use individual data as dependent variables and community-level measures of social capital as regressors. This approach yields a better econometric framework for modelling the effect of social capital.

There is a huge literature on the possible beneficial effects of social capital. They come from three different types of externalities: better transmission of knowledge about the behaviour of other agents, which reduces opportunism; better dissemination of information on markets and technologies, which reduces market information failures; and the facilitating role of collective actions (Collier, 1998).

A local economy characterized by small firms organized in networks is especially dependent on social capital. First of all, social capital fosters the circulation of information and relationships based on trust, not only between subjects within a firm, but also between different firms (Trigilia, 2001). In addition, in a game theory model the proximity of agents, which characterizes a district, makes loyal behaviour rationally necessary for entrepreneurs who have long-term income flow expectations (Kreps,

1990), although in the last of a series of transactions one could be induced to adopt disloyal behaviour.

Moreover, social capital can provide a fundamental building block for extensive use of subcontracting (Nanetti, 1988). Thus it is possible to find economies of scale within the district rather than within the firm.

The link between social capital and districts is also so described by Leonardi (1995): *“without social trust and the adherence to a homogeneous set of community norms, it is not possible to create the system of interaction and networks which now make industrial districts in Tuscany and the rest of central and northern Italy vital actors in the regional and international economy”*.

3. Measuring social capital

Measuring social capital is a difficult task even conceptually. In practical terms, the choice of proxies to measure social capital in Italy at the local level entails two additional problems:

- indicators are collected on existing data sources, since there are no specific surveys on this issue;
- few data are available at the local area level, and they are usually referred to administrative units (regions and provinces), which may be not ideal for analytical purposes.

Therefore, caution needs to be used when interpreting the results.

The empirical approach used here does not start from a specific definition of social capital. On the contrary, using an experimental approach, all variables related to social behaviour, networking and civiness have been considered. We only excluded variables that can be considered a part of other forms of capital (human, physical).

Fifty proxies of social capital were thus selected. These can be grouped into four main dimensions of social capital:

- measures of participation in non-profit organizations;
- measures of informal sociability;
- measures of trust and civiness;
- local-context measures.

Participation in non-profit organizations is measured by the number of members, the number of institutions, and the number of volunteers and employees. We considered indicators collected by census and surveys. According to Putnam (1993) "*Networks of civic engagement, like the neighborhood associations, choral societies, cooperatives, sports clubs, mass-based parties represent intense horizontal interaction. Networks of civic engagement are an essential form of social capital: the denser such networks in a community, the more likely that its citizens will be able to cooperate for mutual benefit*".

Networking is often considered an advantage for economic development, since associations foster the creation of collective goods and produce knowledge spillovers (Beugelsdijk *et al.*, 2002). But there is no consensus on this issue. Putnam (1995) himself distinguishes associations that create "bonds" from those that create "bridges" between different kinds of people, the latter being more useful for fostering economic development. Putnam's point is considered here by excluding foundations from the category of non-profit organizations, as they are by nature less relational and more hierarchical. Nevertheless, we decided to use a wide range of measures of participation in the non-profit sector, since in Italy there are comparatively few lobbying, race-based or social-based groups.

The second group of indicators is related to informal networks, social behaviour and their opposites. Networking and social propensity are considered important not only when they are formalized in organizations. We included also free-riding behaviour as an indicator of the absence of social capital, since trust is influenced by the probability of occurrence of free-rider behaviour on the part of other actors.

Indicators related to families are excluded. This decision is based on the need to keep social capital separated from the so-called "amoral familism" (Banfield, 1958). This is the "*inability of [of people] ... to act together for their common good or, indeed, for any end transcending the immediate material interest of the nuclear family*". Therefore, the presence of family ties could have a negative impact on social capital in the context of Italy, while in other contexts they could be (and are) used as a proxy for social capital.

In the fourth group we considered indicators related to trust and civicness. They include political participation in elections and referenda, personal involvement in politics, etc. The individual interest in public

activities could proxy the propensity to cooperate and could help in the creation of collective goods.

The last group of indicators refers to the characteristics of the local area that foster the creation of social networks (e.g. opportunities for meetings in public places such as cinemas or theatres), or are manifestations of social capital, such as a sense of belonging and feelings of well-being in the local area. There are also indicators of judicial efficiency. Since trust might be the result not only of the presence of social capital in the community, but also of the degree of law enforcement, the inclusion of this variable will provide some correction for the quality of legal enforcement in the area.

4. A principal component analysis on a large dataset

4.1 Static analysis

The principal component analysis (PCA) allows the dimensionality of a set of variables to be reduced with a minimum loss of information. The PCA aims to substitute q new variables (usually $q=3$) for the p original variables (with $q < p$; in our analysis $p=50$). New variables, called principal components, are derived as linear combinations of the p original variables.

First we carry out a PCA on the whole dataset of 50 variables, computed in the most recent year of data availability (usually 1999; see the Appendix). Results are reported in Table 1.

The first component is positively correlated to variables referring to non-profit organization membership (NUMNPO, VOLNPO), social activities (ATTASS, DONASS, DONSAN), intensity of relational satisfaction (AIUVIC, RELAMI, SODTEM), involvement in cultural activities (RIUCUL, OFFCIN), and 'conventional' political participation (VOTPOL, VOTREG, REFFAR, PALPOL, INFPOL e ASCDIB). It is negatively correlated – though we find a less strong correlation – with the crime rate (CRIVIO) and its perception (DURPRO), and with a proxy of justice inefficiency, namely the length of trials. In general, we find the expected signs. More 'committed' political participation, such as engagement with political parties, and less conventional forms, such as participation in demonstrations, show a negative correlation with the first

component. The same sign applies to more formal and structured activities for non-profit organizations (COPSOC and SOCCOP).

Table 1

Principal component analysis. Large dataset. Eigenvectors
(Correlations between variables and principal components)

Variables	1 st principal component	2 nd principal component	3 rd principal component
NUMNPO	0.17	0.14	0.01
OCCNPO	0.07	-0.15	0.18
VOLNPO	0.18	0.11	0.11
VOLVOL	0.14	0.20	0.19
COPSOC	-0.02	0.17	-0.26
ASSREG	0.15	0.21	0.13
RIUECO	0.14	0.14	0.14
RIUCUL	0.17	0.17	0.12
ATTASS	0.17	0.13	0.06
ATTVOL	0.16	0.19	0.16
ATTSIN	0.03	-0.07	-0.08
DONASS	0.19	0.02	0.05
LETGIO	0.15	-0.16	-0.04
INCAMI	0.02	0.03	0.01
AIUVIC	0.16	0.08	0.04
AMICON	0.15	0.14	-0.08
ASSBAN	0.11	0.26	0.23
SOCCOP	-0.06	0.12	0.13
PAUBUI	-0.12	-0.23	0.18
CRIVIO	-0.09	-0.11	0.21
SUICID	0.13	0.01	-0.30
PROCOG	-0.17	-0.06	0.20
PROTES	-0.17	-0.10	0.13
ABBRAI	0.17	-0.70	-0.17
RACDIF	0.16	-0.05	0.01
CONCAP	0.03	-0.24	0.14
GRAURB	0.03	-0.29	0.21
SOVABB	-0.17	0.06	0.17
OFFCIN	0.18	-0.01	0.14
BIGTEA	0.16	-0.13	0.19
DIFPRO	-0.12	0.22	0.00
DIFALI	-0.17	0.00	0.14

(contd)

(Table 1 contd)

Variables	1 st principal component	2 nd principal component	3 rd principal component
FORFUO	-0.14	0.00	0.16
RELAMI	0.19	-0.03	-0.04
ATTCUL	-0.10	-0.11	0.11
SODTEM	0.19	0.02	-0.01
NONRAD	0.11	-0.15	0.25
SALMIG	0.18	-0.08	-0.08
VOTPOL	0.15	-0.13	0.08
VOTREG	0.14	0.13	0.12
PALPOL	0.16	-0.16	0.03
INFPOL	0.18	-0.17	-0.04
ASCDIB	0.18	-0.17	-0.05
PARTCOM	0.10	-0.06	0.17
PARCOR	-0.09	0.26	0.17
GRAPAR	-0.15	0.10	-0.08
DONPAR	-0.03	-0.05	0.20
DURPRO	-0.11	0.20	0.16
DONSAN	0.15	0.00	-0.03
REFPAR	0.18	-0.13	0.00

Source: Based on data listed in the Appendix.

The large dataset includes all the variables in the Appendix.

The second component is negatively correlated with variables measuring crime (CRIVIO), with the proxies of the degree of urbanization (CONCAP and GRAURB) and with the difficulty of accessing essential public utilities.

The third component shows a significant negative correlation with the ratio of suicides in the population.

The first axis corresponds to a synthetic measure of 'classic' social capital, both *à la* Putnam (civicness) and *à la* Granovetter (group membership; social networks). The second axis represents the advantages of a low crime rate and the disadvantages of a little-urbanized area, often lacking some essential services. The third may be considered a lack of anomie *à la* Durkheim.

The first principal component explains 48 per cent of total variability. Together with the second and the third, it synthesizes around 70 per cent.

The first component of social capital is higher in the North-East (Trentino-Alto Adige, Emilia Romagna, Friuli-Venezia Giulia; Table 4). Among the central regions, Tuscany records the highest value. In the South, Abruzzo and Molise show values close to the Centre. In Puglia the stock of social capital is larger than in Campania, Sicily and Calabria. Thus, this first analysis suggests that regions where industrial districts are widespread have the highest level of social capital.

4.2 *Dynamic analysis*

The aim is now to achieve a synthetic representation of the middle-term pattern of social capital in the 1990s, without nullifying its complex reality. We have adopted the multiphase analysis in principal components technique (FAMA analysis). This technique generalizes the principal component analysis to the case of a sequence of matrixes; in this case we have a sequence over time of matrices defined by variables×regions. The FAMA analysis belongs to the set of descriptive techniques of multidimensional analysis designed to synthesize, by means of a few latent variables, the structural information contained in the data (parsimonious representation).

We have chosen to use three multi-year averages as time references: 1987-91 ($t1$), 1992-95 ($t2$) and 1996-99 ($t3$). The variables are considered in the last year of every interval, or, if they are absent, in the year immediately before. Thus we have been forced to drop observations only when a variable is unavailable for any year in one of the three periods. In this manner we have been able to use data that, even if not available on a yearly basis, have been collected at least once in each of the three periods. A typical case is data resulting from non-recurrent surveys or referring to infrequent events (for example, elections).

Our dataset for this dynamic exercise consists of 14 variables. Because of the limited availability of time series, the loss of information, compared with the initial database (which included 50 variables), has been significant. Still, the resulting set of variables – though determined by data availability and not by a purposeful choice – includes variables that are highly correlated with each of the first three principal components in the

static analysis: cultural aspects (LETGIO, OFFCIN, BIGTEA), voter turnout (VOTPOL), observance of rules (PROTES e ABBRAI), impact of criminality (CRIVIO), and inefficiency of justice (DURPRO) are correlated with the first; GRAURB with the second; and SUICID with the third. However, most information about group membership (reported by Istat in the first non-profit organization census in 1999) and about the social connections and trusting behaviour of individuals (from Istat's multi-purpose survey, covering mostly the last year) is not available.

The results are largely consistent with those of the static analysis (Table 2). The first principal component is positively correlated with the

Table 2**FAMA Analysis**

(Correlations between variables and principal components)

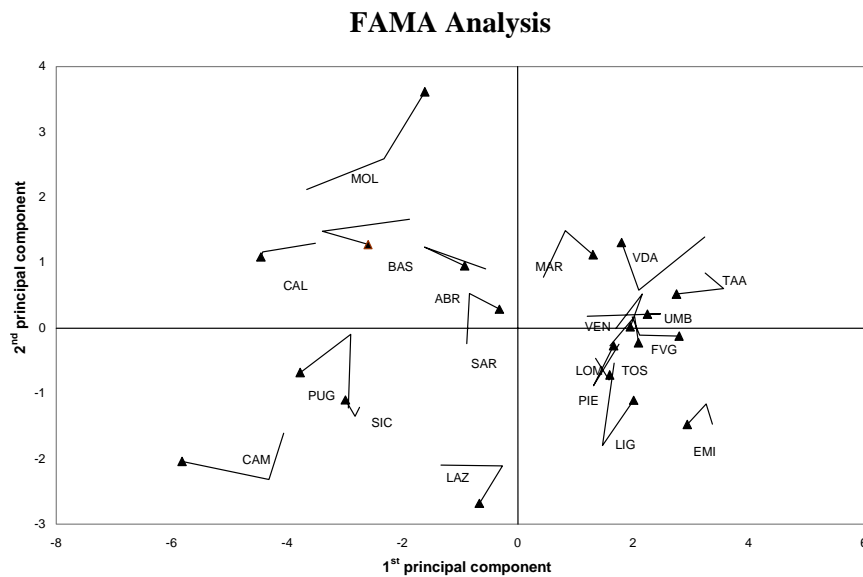
Variables	Comp. 1	Comp. 2
ABBRAI	0.33	0.07
CRUVIO	-0.20	-0.43
PROTES	-0.30	-0.14
SUICID	0.29	0.17
PROCOG	-0.31	0.01
GRAURB	0.03	0.67
OFFCIN	0.32	-0.17
BIGTEA	0.30	-0.31
FORFUO	-0.21	-0.30
VOTPOL	0.32	-0.24
DURPRO	-0.30	0.15
ATTCUL	-0.21	-0.08
SALMIG	0.33	0.02

Source: Based on data listed in the Appendix.

indicators of cultural use, voter turnout, efficiency of justice, observance of rules. The second principal component is strongly (and negatively) correlated with the criminality index (CRIVIO: $-0,43$). The first component explains 84 per cent of variability; the second a further 10 per cent.

Geographically, social capital endowment is highest in the regions of the North-East (Figure 1). During the ten-year period, however, regions starting with the highest levels of social capital (Emilia Romagna, Trentino-Alto Adige and Val d'Aosta) saw their relative position worsen. Some regions that at the beginning showed a lower level than the national mean have experienced a further decline (Campania, Puglia, Sicily, Calabria). On the other hand, improvement was observed in Molise, Marche, Tuscany, Umbria, Veneto and Friuli Venezia Giulia. Two small southern regions (Molise and Basilicata) show a contrast between high values of the second component (low criminality) and a low value of the first.

Figure 1



Source: Based on data listed in the Appendix (see Table 2).

5. A principal component analysis on a small dataset

The static PCA on the large dataset including 50 variables highlights the existence of a core of variables that are significantly correlated with the first principal component. Applying an iterative procedure, we again run a PCA on a smaller dataset, formed by a limited number of variables (25), after eliminating those that are poorly correlated with the first component and/or only weakly connected with the idea of social capital usually discussed in the theoretical literature.

More specifically, we have excluded from the smaller dataset the following variables:

- variables showing a low correlation with the first principal component and referring to very structured and hierarchical non-profit organizations (COPSOC and ATTSIN);
- variables that may have a mixed interpretation, as indicators of both civiness and quality of life, and tend to be correlated with the first component (RELAMI, SODTEM, OFFCIN, BIGTEA and ATTCUL);
- proxies of public sector efficiency (DURPRO);
- variables referring to local area characteristics, such as urbanization (CONCAP, GRAURB, SOVABB, DIFPRO, DIFALI, SALMIG and NONRAD);
- measures of more committed and less conventional political participation (PARCOR and GRAPAR);
- other variables poorly correlated with the first component.

The PCA carried out on the smaller dataset shows a strong and positive correlation between the first component (which explains almost 60 per cent of the variance; Table 5) and indicators of group membership, personal connections, observance of rules, and civiness, such as participation in the electoral and political process (even more closely correlated with the second component). We also find a negative correlation with the actual presence and perception of crime. Signs are always as expected *a priori* (Table 3).

As obtained in the analysis on the large dataset, regions in the North-East have a greater abundance of social capital (Table 4).

6. Extensions

6.1 *Netting out the effect of income*

The PCA discussed in Section 5 reproduces the well-known economic dualism between North and South in Italy. The correlation between the first component and per capita value added, an indicator of income, is very high (0.88; Table 6). It is plausible that social capital depends on income, instead of being exogenous; the richest people could interact more frequently than the poorest in the ways we call social capital.

The extremely high correlation between the measures of social capital we obtain and per capita value added suggest further analysis aimed at identifying the additional contribution of our measures beyond the effect of income. The PCA, in particular, has been replicated on partial correlations (instead of simple correlations), i.e., after eliminating the effect of per capita value added (Table 3).

The results are the following. The first component is positively correlated with the propensity towards membership of groups (NUMNPO, VOLNPO, VOLVOL, ASSREG, RIUECO, ATTASS, ATTVOL and ASSBAN), and the strength of friendship and social network (AIUVIC and AIUCOM); the closeness of these ties, moreover, is connected with a low crime rate (CRIVIO) and little fear of it (PAUBUI).

The second component is positively correlated with conventional political participation (VOTPOL, PALPOL, INFPOL, ASCDIB, PARCOM and REFPAR) and with the observance of rules, even if not legally enforced (ABBRAI and RACDIF). These facts are associated with a high level of monetary donations to charities and associations. As for the first component, the signs of crime and protests are negative.

These results suggest a distinction between the micro and macro components of social capital, consistent with a common definition in the literature. In Coleman's words (1990), we should distinguish between the players and the playing fields. Micro social capital is an individual attribute, which enables a person to reap market and non-market returns from interactions with others. Macro social capital is instead a community-level attribute, which facilitates economic transactions.

Table 3

Principal component analysis. Small dataset. Eigenvectors
(Correlations between variables and principal components)

Variables	Small dataset		Small dataset, effect of per capita value added netted out	
	1 st principal component	2 nd principal component	1 st principal component	2 nd principal component
NUMNPO	0.23	-0.15	0.27	0.01
OCCNPO	0.06	0.17	-0.11	-0.09
VOLNPO	0.25	-0.10	0.29	0.15
VOLVOL	0.21	-0.26	0.31	0.01
ASSREG	0.22	-0.26	0.33	0.03
RIUECO	0.21	-0.14	0.26	0.12
ATTASS	0.24	-0.08	0.27	-0.04
ATTVOL	0.23	-0.21	0.32	0.00
DONASS	0.25	0.06	0.21	0.29
AIUVIC	0.21	-0.02	0.19	0.05
AMICON	0.20	-0.10	0.20	-0.08
ASSBAN	0.18	-0.34	0.30	-0.13
PAUBUI	-0.16	0.24	-0.22	0.06
CRIVIO	-0.12	0.08	-0.13	-0.13
PROTES	-0.22	0.02	-0.21	-0.14
ABBRAI	0.19	0.19	-0.03	0.21
RACCDIF	0.21	0.20	0.00	0.19
VOTPOL	0.18	0.25	-0.05	0.19
VOTREG	0.21	-0.12	0.21	-0.19
PALPOL	0.18	0.28	-0.03	0.38
INFPOL	0.20	0.31	-0.08	0.42
ASCDIB	0.20	0.31	-0.08	0.42
PARTCOM	0.13	0.15	0.03	0.21
DONSAN	0.19	0.12	0.02	-0.06
REFPAR	0.21	0.27	-0.06	0.32

Source: Based on data listed in the Appendix.

The small dataset includes the variables which in the large dataset came out more correlated with the first principal component (see Table 1) and which are conceptually more directly related with the idea of social capital (see text, Section 5).

Table 4

Principal component analysis. Regions
(Principal components)

Regions	Large dataset		Small dataset		Small dataset, effect of per capita value added netted out	
	1 st principal component	2 nd principal component	1 st principal component	2 nd principal component	1 st principal component	2 nd principal component
Piedmont	1.70	-1.51	0.57	1.26	-2.36	-0.83
Valle d'Aosta	3.37	2.66	3.07	-1.38	0.64	-4.68
Lombardy	3.49	-1.95	2.62	2.60	-3.18	-0.31
Trentino A.A.	9.25	7.08	9.44	-5.09	9.55	-1.62
Veneto	4.64	-0.78	3.44	1.82	-0.14	2.03
Friuli V.G.	4.49	-0.93	2.54	0.62	0.29	2.58
Liguria	2.13	-3.41	0.61	1.98	-2.05	2.32
Emilia R.	5.65	-2.89	4.05	2.57	-1.36	1.93
Tuscany	3.63	-0.95	2.77	0.92	0.60	3.10
Umbria	1.59	-0.62	0.71	0.21	0.32	1.22
Marche	0.67	0.53	0.08	-0.39	-0.22	-1.00
Lazio	-1.09	-4.59	-2.07	1.99	-5.21	-2.52
Abruzzo	-2.57	0.01	-2.54	-0.01	-1.15	-0.16
Molise	-3.66	3.13	-2.33	-1.73	1.25	-1.06
Campania	-7.97	-0.90	-5.34	-0.38	-0.76	-0.65
Puglia	-6.09	-0.60	-3.93	0.09	-0.28	1.27
Basilicata	-5.97	3.03	-3.76	-1.76	0.61	-1.80
Calabria	-7.03	1.69	-4.89	-1.83	0.85	-0.64
Sicily	-6.33	0.63	-5.07	-1.10	-0.35	-2.14
Sardinia	0.11	0.37	0.03	-0.41	2.93	2.96

Source: Based on data listed in the Appendix.

The first axis in our PCA summarizes the micro social capital *à la* Coleman, (group membership, friendship, social network). The second axis indicates the macro social capital *à la* Putnam (civiness, observance of rules).

The first component (micro) is lower in some of the regions large cities are located, such as Lazio (Rome), Lombardy (Milan), Piedmont (Turin); and it is higher in many smaller regions, such as Umbria, Basilicata, Molise, Valle d'Aosta and, above all, Trentino-Alto Adige (Table 4).

The second component (macro), even after conditioning on income, is widespread in the regions of the Centre and North-East (NEC), notably Tuscany, Emilia-Romagna, Veneto and Friuli-Venezia Giulia, which are district intensive.

Table 5

Principal component analysis. Explained variances
(Cumulative)

Principal components	Large dataset	Small dataset	Small dataset, effect of per capita value added netted out
1 st principal component	0.48	0.57	0.34
2 nd principal component	0.61	0.71	0.53
3 rd principal component	0.69	0.77	0.63
4 th principal component	0.75	0.82	0.72
5 th principal component	0.80	0.87	0.79

Source: Based on data listed in the Appendix.

The correlations between this second component and some important economic outcomes support the hypothesis that areas where industrial districts are located have abundant macro social capital. The second component shows a positive correlation with the district and industrial intensity indicators (Table 6); it is negatively correlated with an index of vertical integration (frequent and strong subcontracting ties between SMEs are typical of industrial districts). In the regions that are better endowed with macro social capital, human capital is also larger, especially when the latter is measured by the ratio of the number of high school students to total population. However, the correlation is weak if we use the percentage of graduates in the total population as a proxy of human

capital. In these regions the supply of services to firms is instead lower. Inequality – measured by Gini’s income and wealth concentration indices, as reported by Cannari and D’Alessio (2003) – is greater where social capital is scarce.

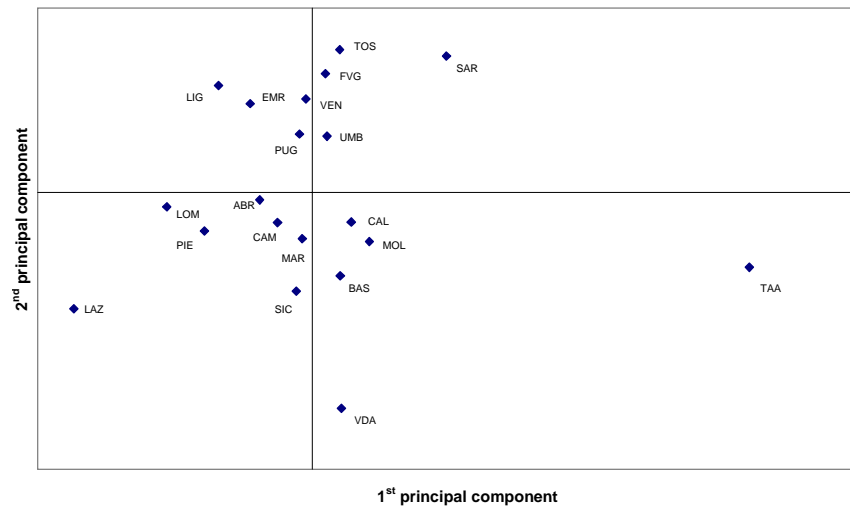
Table 6**Correlations between principal components and economic variables**

Variables	Small dataset		Small dataset, effect of per capita value added netted out	
	1 st	2 nd	1 st	2 nd
	principal component	principal component	principal component	principal component
Local unit average size	0.50	0.48	-0.29	0.10
Value added on sales	0.20	0.13	-0.07	0.09
Vertical integration index	0.18	-0.20	0.13	-0.32
Capital on value added	-0.42	-0.36	0.15	-0.20
Sectorial propensity to export	0.26	0.59	-0.44	0.18
Value added share of the high technology Sectors	-0.28	0.21	-0.36	-0.13
Employment of firms’ services on total employment	-0.41	-0.18	-0.12	-0.40
Graduates on population	0.05	0.57	-0.58	0.06
Road kms on area (10,000 ha)	-0.06	0.61	-0.58	0.20
Number of local units on area	0.26	0.71	-0.47	0.32
Industry employees on total population	0.63	0.50	-0.17	0.30
Manufacture employees on total Employees	0.50	0.53	-0.23	0.35
District intensity index	0.49	0.47	-0.16	0.38
Activity rate	0.90	0.07	0.24	-0.08
Value added	0.88	0.30	--	--
Net firm creation	-0.10	-0.48	0.44	-0.04
Median sales of industrial firms	0.79	0.19	0.13	0.09
Short-term rates on cash funds	-0.76	-0.53	0.18	-0.24
High school students on population	-0.03	0.39	-0.35	0.33
Non-farm firms on 100 inhabitants	0.74	0.34	-0.01	0.21
Gini’s income concentration index	-0.64	-0.32	-0.12	-0.51
Gini’s wealth concentration index	-0.38	-0.07	-0.26	-0.45

Source: Based on Cannari and Signorini (2000) data, Cannari and D’Alessio (2003) data, Bank of Italy, Istat and Cerved.

Figure 2

**Principal component analysis. Small dataset,
effect of per capita value added netted out**



Source: Based on data listed in the Appendix.

6.2 Preliminary evidence at the provincial level

Analysis at the provincial level suffers from limited availability of data. In particular, we have no public opinion poll. Partialling out the effect of GDP, the PCA carried out on provincial data finds two components that we again interpret as respectively macro and micro social capital.⁴ The macro component, which explains a fourth of total variance, is positively correlated with variables relating to the observance of rules, blood donations and political participation (CRIVIO, PROTES, VOTREG, DONSAN and REFPAR) and negatively correlated with crime.

⁴ The results, not reported here, are available from the authors. The analysis has used the following variables: NUMNPO, OCCNPO, VOLNPO, ASSREG, DONSAN, CRIVIO, PROTES, VOTREG and REFPAR.

On the basis of this analysis, macro social capital is less abundant in provinces with the largest cities (Milan, Rome, Palermo, Naples, Turin). By contrast, there are six provinces of Tuscany ranked in the first 25 positions (and 17 of the Centre and North-East). The correlation between the macro component and district intensity is positive (0.24 per cent; it grows to 0.61 per cent if the PCA is not partial).

7. Conclusions

This work sets out the results of an empirical analysis of social capital in Italy at the regional level, and also at the provincial level, as far as data availability allows it. The growing interest of economic theory in social capital is hampered by measurement difficulties, which are much greater than those posed by other forms of capital, and unfortunately not all fully surmountable. Certain scholars even think that no synthetic measure can be adequate, given the inherently multifaceted content of this notion.

Although the task is arduous, in our opinion the measurement of social capital cannot be side-stepped. Surely, one should be aware of its limits.

First of all, measurement difficulties have required a reconnaissance of available data at regional and provincial level in order to acquire a wide range of variables. The multiplicity of variables, on the one side, is consistent with the need to stick as closely as possible to the concept of social capital developed by the literature; but, on the other side, it creates the need to find some way to construct a synthetic measure. For this purpose, we have used the principal component analysis. In any event, problems of measurement invite caution in interpreting the results.

Regions in the North-East, particularly Trentino-Alto Adige and Emilia-Romagna, have the largest stock of social capital. To avoid confusion between social capital and income, the exercise has been replicated after netting out the effect of per capita GDP. According to this analysis, the simple dualism between northern and southern Italy does not provide an exhaustive map of social capital in Italy. The so-called 'Third Italy' regions – North-East and Tuscany especially –, where the incidence of industrial districts is remarkable, are highly endowed with social capital, and more precisely with the 'macro' component of social capital. This

'macro' social capital is a public good, while the other component of social capital, the 'micro' one, is an individual and relational attribute.

The concern about causality link remains. Does social capital foster economic growth, in particular that based on small and medium firms located in industrial districts? Or, on the contrary, does economic prosperity contribute to the accumulation of social capital? This question cannot find an answer in this study.

APPENDIX

Here follows a brief description of the indicators used as proxies for social capital. They are classified in four main dimensions of social capital, as discussed in Section 3.

Measures of participation in non-profit organizations:

NUMNPO. Number of non-profit organizations (excluding foundations) per 100,000 inhabitants. Source: Istat, *1st Census on Non-profit Organizations (NPOs)*. Year 2000.

OCCNPO. Percentage of employees in non-profit organizations (excluding foundations) on total employees. Source: Istat, *1st Census on NPOs*. Year 2000.

VOLNPO. Number of voluntary members participating in non-profit organizations (excluding foundations) per 100,000 inhabitants. Source: Istat, *1st Census on NPOs*. Year 2000.

VOLVOL. Number of volunteers in charitable organizations (as per Law 291/91) per 100,000 inhabitants. Source: Istat. Year 1999.

ASSREG. Number of charitable organizations (as per Law 291/91) per 100,000 inhabitants. Source: Istat. Year 1999.

RIUECO. Attendance at meetings of associations involved in the preservation of the environment, civil rights, etc. People over 14 years old who attended such meetings in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

RIUCUL. Attendance at meetings of cultural associations. People over 14 years old who attended such meetings in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

ATTASS. Volunteering for a charitable organization. People over 14 years old involved in this activity in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

ATTSIN. Volunteering for a charitable organisation. People over 14 years old involved in this activity in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

ASSBAN. Number of partners of mutual banks per 100,000 inhabitants. Source: Banca d'Italia. Year 2001.

ATTVOL. Individual charitable volunteering (not inside a charitable organization). People over 14 years old who took part in this activity in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

SOCCOP. Number of partners of cooperatives (mutual societies) (not charitable ones) per 100,000 inhabitants. Source: Ministry of Productive Activities. Year 2000.

COPSOC. Number of charitable cooperatives per 100,000 inhabitants. Source: Istat. Year 1999.

Measures of informal sociability:

INCAMI. Percentage of people, aged over 6, who meet friends at least once a week (per 100 inhabitants). Source: Istat. Year 1999.

AMICON. Percentage of people, aged over 14, who consider their friends trustworthy (per 100 inhabitants). Source: Istat. Year 1999.

RELAMI. Percentage of people very satisfied with their friendships. Source: Istat. Year 1999.

SODTEM. Percentage of people very satisfied with their leisure time. Source: Istat. Year 1999.

AIUVIC. Percentage of people, aged over 14, who in the last four weeks gave help to anyone outside their household (per 100 inhabitants). Source: Istat. Year 1999.

DONASS. Donations to associations. People over 14 involved in this activity in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

DONSAN. The number of blood bags per million inhabitants collected by Avis, the Italian association of blood donors. In Italy, it collects over 90 per cent of total blood donations. There is no Avis local branch in four provinces (Genoa, Caserta, Avellino, Caltanissetta). Source: calculated by Guiso *et al.* (2004) on data collected by Avis. Year 1997.

SUICID. Number of suicides per 100,000 inhabitants. Source: Istat. Year 1996.

CRIVIO. Violent criminal behaviour index per 100,000 inhabitants. Source: Istat. Year 1998.

PROTES. Number of protests per 100,000 inhabitants. Source: Istat. Year 1999.

Indicators related to trust and civicness:

REFPAR. Average voter turn-out for the referenda held between 1946 and 1987. The referenda were on the following issues: choice between republic and monarchy in 1946; divorce legislation in 1974; public financing of parties in 1978; public security and anti-terrorism in 1981; abortion legislation in 1981; wage escalator clauses in 1985; nuclear power and hunting regulation in 1987. Source: calculated by Guiso *et al.* (2004) on data collected by the Ministry of Interior.

VOTPOL. Voter turn-out at the general elections held between 1999 and 2001. Source: Ministry of Interior.

VOTREG. Voter turn-out at the regional elections held in 2001. Source: Ministry of Interior.

PALPOL. People over 14 years old who talk about politics at least once a week (per 100 inhabitants). Source: Istat. Year 1998.

INFPOL. People over 14 years old who look for information or talk about politics at least once a week (per 100 inhabitants). Source: Istat. Year 1998.

ASCDIB. Listened to a political debate. People over 14 years old who took part in this activity in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

PARTCOR. Participated in a demonstration. People over 14 years old who took part in this activity in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

GRAPAR. Worked without pay for a political party. People over 14 years old who took part in this activity in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

DONPAR. Gave money to a political party. People over 14 years old who took part in this activity in the year before the interview (at least once a year) per 100 inhabitants. Source: Istat. Year 2000.

LETGIO. Number of newspapers sold per 1,000 inhabitants. Source: Istat. Year 1998.

ABBRAI. Number of radio-television public service licences per 1,000 inhabitants. Source: Istat. Year 2000.

RACDIF. Percentage of selective garbage collection on the total amount of garbage. Source: Istat. Year 1999.

Territorial variables:

BIGTEA. Tickets sold for theatre performances per 100 inhabitants. Source: Istat. Year 1998.

OFFCIN. Numbers of cinemas per 100,000 inhabitants. Source: Istat. Year 1998.

DURPRO. Length of first-instance ordinary court proceedings. Average value at local area level of ordinary civil proceedings completed by courts, weighted by population. Source: Istat. Year 1999.

PROCOG. Incoming first-instance ordinary court proceedings. Ratio between the number of incoming first-instance ordinary proceedings under the jurisdiction of the court and the population (in tens of thousands). Source: Istat. Year 1999.

PAUBUI. Percentage of people, aged over 14, who feel unsafe, to varying degrees, while walking alone in a dark street. Source: Istat. Year 1998.

DIFPRO. Percentage of families who find it difficult, to varying degrees, to reach the nearest casualty department. Source: Istat. Year 1998.

DIFALI. Rate of families that declare it difficult to reach a food store or a food market. Source: Istat. Year 1998.

FORFUO. Percentage of woodland area involved in fires on total woodland area. Source: Istat. Year 1996.

GRAURB. Percentage of people who live in municipalities with more than 100,000 inhabitants on total inhabitants. Source: Istat. Year 2000.

CONCAP. People who that live in the main municipality of the area per 100 inhabitants of the others municipalities in the local area. Source: Istat. Year 2000.

SOVABB. People who live in over-crowded houses per 1,000 inhabitants in the local area. Source: Istat. Year 1991.

NONRAD. Rate of foreigners not integrated in the local area to total population. Source: Calculations based on data collected by Ferruzza *et al.* (1995) and Istat. Year 1998.

SALMIG. Changes (not for natural causes) in the number of people resident in a given area per 100,000 inhabitants. Source: Istat. Year 1999.

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