

## UNPACKING SOCIAL CAPITAL\*

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We use novel survey data from Italy to shed light on key questions regarding the measurement of social capital and the use of social capital indicators for empirical work. Our data cover a sample of over 600,000 respondents interviewed between 2000 and 2015. We identify four distinct components of social capital—(i) social participation, (ii) political participation, (iii) general trust and (iv) trust in institutions—and examine how they relate to each other. We then study how each dimension of social capital relates to various socio-economic factors, both at the individual and aggregate levels, and to various proxies of social capital commonly used in the literature. Finally, building on previous work, we investigate to what extent different dimensions of social capital predict differences in key economic, political and health outcomes. Our findings support the view that social capital is a multi-faceted object with multiple dimensions that, while related, are distinct from each other. Future work should take such multi-dimensionality into account and carefully consider what measure of social capital to use.

Over the past decades a vast interdisciplinary literature has studied the concept of social capital and its impact on various economic and political outcomes.<sup>1</sup> Despite this considerable body of work, the very definition of social capital remains unclear. Some scholars define it in terms of social networks and relations (both formal and informal).<sup>2</sup> Others define social capital in terms

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The data and codes for this paper are available on the Journal repository. They were checked for their ability to reproduce the results presented in the paper. The authors were granted an exemption to publish parts of their data because access to these data is restricted. However, the authors provided a simulated or synthetic dataset that allowed the Journal to run their codes. The synthetic/simulated data and the codes for the parts subject to exemption are also available on the Journal repository. They were checked for their ability to generate all tables and figures in the paper; however, the synthetic/simulated data are not designed to reproduce the same results. The replication package for this paper is available at the following address: <https://doi.org/10.5281/zenodo.12733624>.

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<sup>1</sup> Social capital is one of the most studied concepts in the social sciences. A search for ‘social capital’ on Google Scholar returns 2,670,000 results. Web of Science returns 25,962 articles published since 1988 with social capital as the topic, and 10,824 with social capital in the title. There are entire websites that carefully survey the research on social capital, such as [Social Capital Gateway](#) and [Social Capital Research](#).

<sup>2</sup> See Bourdieu (1986), Burt (1997), Portes (1998) and Lin (2001).

of beliefs and norms, such as trust, civic duty, law abidingness.<sup>3</sup> Others view social capital as inherently multi-dimensional. Coleman (1988, p.98), who first popularised the term, wrote that social capital is ‘not a single entity but a variety of different entities’.<sup>4,5</sup>

Difficult to define, social capital is equally difficult to measure. Fukuyama (2000, p.9) wrote that ‘one of the greatest weaknesses of the social capital concept is the absence of consensus on how to measure it’. Most work in economics focuses on one aspect of social capital and then tries to measure this using a creative proxy. Common proxies include variables as diverse as the number of voluntary associations or non-profit organisations, participation in voluntary social and political organisations, newspaper readership, church attendance, time spent with friends, trust in others, trust in institutions, indicators of good government, work effort, blood or organ donations, turnout in elections or referenda, cheating in school tests, tax evasion, spending in education and the fraction of people living in small and isolated communities.<sup>6</sup> Some recent work measures one network component of social capital directly, using the intensity of personal connections on online social media platforms.<sup>7</sup>

Critics argue that many of these variables measure manifestations of social capital, rather than social capital itself, and that they suffer from unknown, but likely large and non-random measurement error (Engbers *et al.*, 2017).<sup>8</sup> Equally important, these variables capture diverse attitudes, behaviours and cultural characteristics that are likely to influence different economic outcomes. For example, while social participation may be relevant for the study of collective action, trust is arguably an important driver of financial decisions. Unfortunately, separating the different dimensions of social capital is empirically challenging because high-quality data are usually scarce, or they are only available at high levels of aggregation, or they are only representative of very large geographical units.

This paper aims to shed light on several key questions regarding the measurement of social capital and the use of social capital indicators for empirical work. To do so, we leverage a novel and unique dataset from Italy, a country that has been the focus of much of the social capital literature.<sup>9</sup> The data come from a large, annual, cross-sectional survey conducted by the

<sup>3</sup> See Arrow (1999), Fukuyama (2000), Guiso *et al.* (2011), Giuliano and Wacziarg (2020) and Ginzburg and Guerra (2021).

<sup>4</sup> See also Putnam *et al.* (1993), Serageldin and Dasgupta (2001), Uslaner (2002) and Fischer (2005).

<sup>5</sup> Other distinctions in the literature include ‘bonding’ and ‘bridging’ social capital (e.g., Gittel and Vidal, 1998; Aldridge *et al.*, 2002), and between ‘structural’ and ‘cognitive’ social capital (e.g., Uphoff and Wijayaratra, 2000). For a more comprehensive discussion of the definition of social capital, see, among others, Adler and Kwon (2002), Fulkerson and Thompson (2008) and Bjørnskov and Sønderskov (2013).

<sup>6</sup> Examples of empirical papers using these measures are Putnam (1993), La Porta *et al.* (1997), Brehm and Rahn (1997), Knack and Keefer (1997), Goldin and Katz (1998), Paxton (1999), Ichino and Maggi (2000), Franzen (2003), Li *et al.* (2003), Guiso *et al.* (2004), Aizlewood and Pendakur (2005), Alm and Gomez (2008), Buonanno *et al.* (2009), Kaasa (2009), Liu *et al.* (2009), Millo and Pasini (2010), Tabellini (2010), Guillen *et al.* (2011), Nannicini *et al.* (2013), Farris and Holman (2014), Butler *et al.* (2016), Guiso *et al.* (2016), Hunecke *et al.* (2017), Buggle and Durante (2021) and Durante *et al.* (2021).

<sup>7</sup> Prominent examples of this approach include Chetty *et al.* (2022a,b), who used data from Facebook to study social capital and its relationship with economic mobility, cohesiveness and economic connectedness. More information on this research, as well as the aggregate data, can be accessed through the project’s portal: <https://socialcapital.org>. Similarly, Obradovich *et al.* (2022) expanded the measurement of culture by exploiting a very large dataset from Facebook of over two billion individuals across more than 200 countries.

<sup>8</sup> According to Engbers *et al.* (2017, p.550): ‘the field has become heavily dependent on proxies for the measurement of social capital. This dependence on proxies is a fact consistently bemoaned by even the most recent research... The quality of these proxies varies tremendously. Some proxies are merely correlational such as the use of crime rates to measure trust or measures of demographic diversity to measure shared norms. Others are more widely accepted and theoretically robust, such as the use of group memberships to account for the size or nature of a person’s social network.’

<sup>9</sup> See, e.g., Banfield (1967), Putnam *et al.* (1993) and Guiso *et al.* (2004).

Italian National Institute of Statistics (ISTAT) and cover a sample of over 600,000 respondents interviewed between 2000 and 2015.<sup>10</sup> Three features of the survey allow us to tackle a number of important measurement issues: (i) it contains a large battery of questions on various social attitudes and behaviours, (ii) the sample size is very large and (iii) it contains detailed geographic identifiers that—combined with the large sample size—allow for a very fine-grained level of spatial disaggregation.

Our findings provide several important insights for future empirical and theoretical research on social capital. First, they confirm that social capital is a multi-faceted object—a kind of ‘umbrella concept’—with at least four dimensions. Second, they shed light on the link between social capital and socio-demographic characteristics, both at the individual and at the aggregate levels, and on the importance of separating these two levels of analysis. Third, they stress the need to use accurate measures to ‘unpack’ the different dimensions of social capital when testing its impact on different outcomes, to reduce the risk of interpreting spurious relations as causal. Fourth, they call for caution in the use of some common proxies of social capital—such as blood donations—and for a better understanding of what factors they may truly capture. Last but not least, our analysis speaks to the need to improve the design of social capital surveys so they capture certain aspects that are currently neglected, but that are essential to improve our understanding of this phenomenon.

How do we arrive at these insights? In the first part of the paper, applying principal component analysis, we identify four clearly distinct dimensions of social capital. We label these (i) social participation, (ii) political participation, (iii) trust in others and (iv) trust in institutions. The first two dimensions relate to the notion of social capital as social networks and relations. In particular, social participation refers to citizens’ propensities to participate in or support voluntary associations (e.g., cultural, religious, sport), while political participation refers to the propensity to participate in or support political parties or workers’ unions and to engage in political activities besides voting (e.g., rallies, demonstrations, debates). The other two dimensions refer to the notion of social capital as norms and beliefs and respectively capture people’s propensity to trust others (including strangers) and to trust institutions (both national and supranational). Within individuals, the four components only weakly correlate with each other, which indicates that they reflect rather distinct facets of social capital.<sup>11</sup> To demonstrate that these findings are not specific to Italy, we replicate the analysis using data from the World Values Survey (WVS) and find strikingly similar patterns in other countries.

Next, we study how different dimensions of social capital relate to various socio-economic characteristics, both at the individual and aggregate (i.e., provincial) levels.<sup>12</sup> In this respect, we find that while certain characteristics—i.e., employment status and, especially, education—are strongly associated with higher levels of social capital at the individual level, this relationship

<sup>10</sup> The survey is the ‘Multipurpose Survey on Households: Aspects of Daily Life’ (*Indagine Multiscopo sulle Famiglie: Aspetti della Vita Quotidiana*). More information on the survey is available at <https://www.istat.it/it/vita-quotidiana-opinione-cittadini?classificazioni>.

<sup>11</sup> Previous studies have applied principal component analysis, or other latent variable techniques, to batteries of survey questions or to collections of aggregate-level variables. Examples include Brehm and Rahn (1997), Paxton (1999), Onyx and Bullen (2000), Baum *et al.* (2009), Kaasa (2009), Sabatini (2009), Van Assche *et al.* (2013), Saukani and Ismail (2019)—which use individual survey data—and Putnam *et al.* (1993), Rice and Sumberg (1997), Coffé and Geys (2005) and Bjørnskov (2006)—which use aggregate data. While some of these studies use factor analysis to build a single measure of social capital, others use it to create several distinct social capital indicators, as we do here. While common in other disciplines, this approach is not yet widespread in economics.

<sup>12</sup> To ensure the data are largely representative of the population, we carry out our analysis at the provincial level (Italy had around a hundred provinces over the period of analysis).

is generally weaker when looking at the aggregate (provincial) level. This finding suggests that, within a given area, more educated individuals tend to be especially engaged and socially active, but that the presence of a larger share of such individuals does not necessarily boost the overall level of social capital. One possible interpretation of this finding is that, even in small numbers, individuals who are more active and civically minded may operate as ‘catalyzers’, making it easier for other members of the community to cooperate and act collectively. More generally, this result is relevant for empirical work as it highlights that, especially when studying social capital, the appropriate set of controls may depend on the level at which the analysis is carried out.

We then examine the relationship between our survey-based measures and other variables that have been commonly used in the literature to proxy for social capital. These include the density of non-profit organisations, voter turnout in elections (both national and local) and popular referenda, newspaper readership, blood donations and a measure of cheating in birth-date registration.<sup>13</sup> We find that most variables tend to be correlated with some components of social capital, but not with others. For example, newspaper readership, cheating in birth-date registration and turnout at national elections are related to social participation, general trust and institutional trust, but not with political participation. Other variables, such as the density of non-profit organisations and, especially, turnout in referenda, show instead a more consistent pattern and are highly correlated with all components. Interestingly, turnout in national and local elections is poorly correlated with political participation. This is arguably due to the fact that the survey measure captures other forms of political engagement, beyond voting, that respond less to transitory electoral considerations and reflect deeper socio-cultural factors. Taken together, these results further confirm the multi-dimensional nature of social capital, and the importance of choosing empirical measures that appropriately match one’s conceptual framework. For example, blood donation, which is one of the most common proxies of social capital, shows a positive and significant correlation with social participation and general trust, but no relationship with political participation and institutional trust. Also, the correlation between blood donation and general trust is zero when conditioning on geography.

Next, we explore what facets of social capital tend to be associated with different socio-economic outcomes the literature has investigated. First, we study the influence of social capital on financial development and crime, building on two prominent contributions by Guiso *et al.* (2004) and Buonanno *et al.* (2009), respectively. For each paper, we replicate the main analysis, replacing the measures of social capital originally used with our four components. In this respect, the fact that our four measures of social capital are derived from the same survey makes comparing their respective effects easier and more compelling. For financial development, we find that interpersonal trust is the only one of our four variables that consistently displays a positive and statistically significant effect. This finding is very much in line with the conceptual framework proposed by Guiso *et al.* (2004), which emphasises the role of ‘generalised’ trust (i.e., trust towards people outside the family) in determining people’s attitudes towards and participation in financial markets. For crime, we find that political participation and, especially, social participation display a negative and significant effect on the outcome, while this is not the case for interpersonal and institutional trust. We also find the survey-based measure of social participation to be a strong and accurate predictor of crime. These findings support the argument of Buonanno *et al.* (2009) that an active civil society is instrumental in reducing crime, and that

<sup>13</sup> The measure of cheating in birth-date registration has been proposed by Anelli *et al.* (2023).

promoting civic participation may be an effective crime-detering strategy. Interestingly, we find that both financial development and crime are significantly related to blood donations even when all survey-based measures of social capital are controlled for. This suggests that this variable may capture some other aspect of social capital—beyond political and social participation or trust—that has an independent impact on these outcomes.

Finally, we present some descriptive evidence of the link between our measures of social capital and a wider range of economic, political and health outcomes. In this context, we observe that different dimensions of social capital relate to different outcomes in intuitive ways. For example, social participation and interpersonal trust are more strongly related to health outcomes (obesity, smoking) and economic outcomes (value added, female labour market participation), while political participation matters more for political outcomes (educational attainment of local politicians, information about politics).

The remainder of the paper is organised as follows. Section 1 describes the data. Section 2 presents how we measure the different components of social capital. Section 3 presents how the different dimensions of social capital correlate with individual- and area-level characteristics. Section 4 explores the relation between our measures and standard proxies of social capital used in the literature. Section 5 studies the influence of social capital on financial development and crime, revisiting two influential studies, and Section 6 presents an analysis of the relationship between social capital and a wider range of economic, political and health outcomes. Section 7 concludes.

## 1. Data

### 1.1. *Social Capital*

Our analysis exploits unique large-scale data from the ‘Aspects of Daily Life’ survey (ADL survey henceforth) conducted by the Italian National Institute of Statistics (ISTAT, 2000–15). The ADL is part of an integrated system of social surveys—the Multipurpose Household Surveys—aimed to collect comprehensive information about the daily life of Italian households. The ADL survey is a repeated cross section conducted every year in March on a sample of about 40,000 individuals.<sup>14</sup>

The ADL survey is especially suitable to study social capital for a number of reasons. First, in addition to standard questions about socio-demographic characteristics, labour market and educational outcomes, the survey contains a battery of questions about various aspects of the respondents’ social activities and attitudes.<sup>15</sup> In particular, respondents are asked whether they participate in and/or support the activities of different types of organisations (cultural, religious and sport associations, political parties, workers’ unions, etc.), whether they engage in political activities besides voting and how much they tend to trust their fellow citizens, as well as institutions. The

<sup>14</sup> All members of the households included in the ADL sample are interviewed. Interviews are conducted in person; if a household member is absent or unavailable, another meeting is arranged within a fixed time frame. If a person cannot be interviewed, another member of the household answers the questions in her/his place. In the years 2000, 2001, 2002 and 2003 the survey was carried out in November. More information is available at <https://www.istat.it/it/vita-quotidiana-opinione-cittadini?classificazioni>.

<sup>15</sup> The ADL questionnaire is divided into three parts: (i) a general questionnaire to collect socio-demographic information for all family members (i.e., age, sex, marital status, educational attainment, etc.), (ii) a household questionnaire to collect general information about the household and (iii) an individual questionnaire administered to each household member.

full list of twenty-four questions relevant to our analysis is reported in [Online Appendix Table A1](#), while their descriptive statistics are reported in [Online Appendix Table A2](#).

Second, the ADL survey has been conducted for over twenty years and, during this period, the set of questions has remained fairly stable. Hence, these data are suitable to study the state and evolution of social capital over a long time span. In particular, our analysis uses data from 2000 up until 2015 that were made accessible to us, with the exception of 2004 when the survey was not administered, and is based on an overall sample of almost 600,000 individuals. Although children are also surveyed, our analysis focuses on individuals aged sixteen and above.

Third, the ADL data allow us to study social capital at a fine geographical level. Italy has twenty regions, 110 provinces and approximately 8,000 municipalities. While almost all of the previous analyses of social capital in Italy have been conducted at the regional or provincial level, our agreement with ISTAT gives us access to confidential information on the respondents' municipalities of residence. Yet, we do not use this information in the analysis presented in this paper that is performed at the provincial level so as to facilitate the comparison between our results and those in previous studies. In this regard, it is important to note that, while the ADL survey is designed to be representative at the regional level, given the large sample size, the data reflect well many key underlying characteristics of the population at the provincial level (as shown in [Online Appendix Figure A1](#)).

#### 1.1.1. *Social capital—across countries*

To measure social capital across countries, we use data on thirty-four questions about social attitudes and behaviour from the World Values Survey (Inglehart *et al.*, 2014). We focus in particular on the 2010–12 round that covers sixty countries. We also complement these data with a set of socio-demographic information for these countries. More precisely, *Value Added* per capita and *Female Labour Market Participation* are from the World Bank (2012) for the year 2012; *Smoking* and *Body Mass Index* (BMI) are from the World Health Organization (2012) for the years 2010 and 2012, respectively; *Democratic culture* comes from the Our World in Data (2010) for the year 2010.

#### 1.1.2. *Other measures of social capital*

We collect data on a set of variables that have commonly been used in the literature to measure social capital. These include the number of non-profit organisations per capita, available from ISTAT and previously used, among others, by Buonanno *et al.* (2009) and Butler *et al.* (2016); the turnout rates in national elections, local elections and popular referenda, available from the Italian Ministry of Interior for the years 2009 and 2011 and previously used by Guiso *et al.* (2004) and Buonanno *et al.* (2009); per capita circulation of non-sport newspapers, available from *Accertamenti Diffusione Stampa* (ADS) for the period 2005–10, and previously used by Nannicini *et al.* (2013) and Durante *et al.* (2021); the number of blood donations per capita, available from the Italian Association of Blood Donors for the year 1995, and previously used by Guiso *et al.* (2004); and the estimated incidence of cheating on birth-date registration, computed by Anelli *et al.* (2023) based on data from the 1991 ISTAT census.

### 1.2. *Other Data*

We also use data from a number of sources.

### 1.2.1. *Socio-demographic characteristics*

**Italian provinces:** We collect information on a battery of geographic and socio-demographic characteristics at the province level, including area, altitude, presence of airports, population, population density, age, education, employment, home ownership, labour market participation and the share of migrants. Information on these variables comes from the Census (ISTAT, 2011).

### 1.2.2. *Data on other outcomes*

In Section 6 below we use data from several additional sources. First, when studying the relationship between social capital and health outcomes, we use two variables derived from the ADL survey: (i) the BMI, computed as the ratio between weight and the square of the height, and (ii) the share of respondents in a province who report having smoked in the past twelve months. Regarding economic outcomes, we use information on value added and female labour market participation, available from the Census (ISTAT, 2011). Third, for political outcomes, we use two different measures. First, the level of political information at the province level. Specifically, we consider the share of ADL respondents in a province who report regularly getting informed about politics. Second, we use information on the level of education of local elected officials. Specifically, we consider the share of mayors elected in a province that have at least a college degree. This information is available from the Registry of Local Administrators, assembled by the Italian Ministry of Interior (Interior Ministry, 2012). Finally, we use two measures of the incidence of tax evasion, both actual and perceived. First, we consider the share of households in a province that paid the TV license fee ('canone'). This is a fee that all Italian families owning a television (or a radio) are legally required to pay every year, but the payment of which was, until recently, poorly enforced and largely left to users' discretion.<sup>16</sup> Second, we consider the share of respondents in the ADL survey in a province who mention tax evasion as the most important problem in the country.

## 2. Measuring Social Capital

### 2.1. *Principal Component Analysis and Social Capital Measure Construction*

Previous research suggests that the concept of social capital comprises several aspects that are distinct, but intertwined. To identify relevant dimensions of social capital in our data, we apply a principal component analysis (PCA) to the twenty-four survey questions introduced above. We use only the years for which all questions are available.<sup>17</sup> Based on the scree plot of eigenvalues reported in Figure 1, we decide to focus on the first four components, which, together, explain 48.2% of the overall variation in the underlying variables, and to disregard additional ones that increase explanatory power only marginally.

In Table 1 we report the twenty-four variables, the four components and their respective factor loadings, which indicate how much each variable contributes to each component. The loadings are obtained from an orthogonal varimax rotation and are reported in bold when above  $-/+0.2$ .<sup>18</sup>

<sup>16</sup> Data on the payment of the television fee are available from the Italian national public broadcasting company (RAI). Previous studies have used this variable as a measure of tax compliance and of the tendency to free ride on contributions to a public good; these include Buonanno *et al.* (2009; 2022) and Buonanno and Vanin (2017).

<sup>17</sup> Using all years does not change the results of the PCA analysis.

<sup>18</sup> We rotate the principal component results to facilitate interpretation. Varimax rotation—which rotates the principal components to maximise the sum over the columns of the within-column variances—is one of the most commonly used methods. The total variance explained by the four components is by construction the same as in the non-rotated case, i.e., 48.2%.

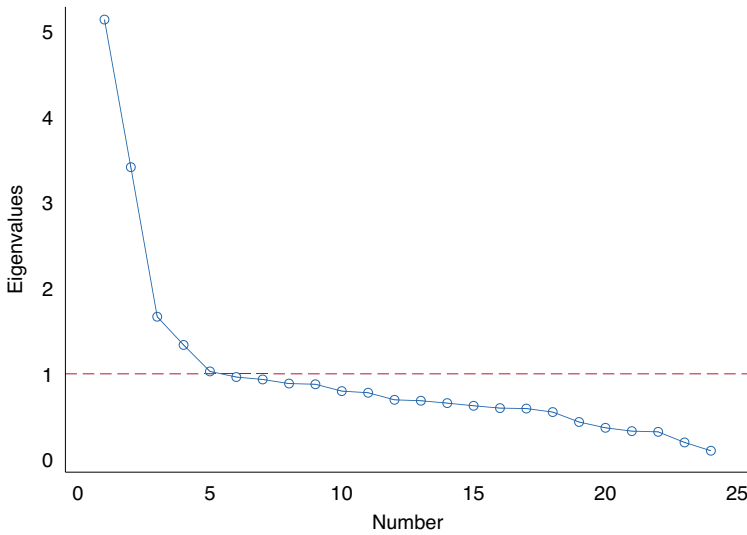


Fig. 1. *Scree Plot for PCA of Social Capital Items.*

*Notes:* The figure plots the factors and the corresponding eigenvalues after a principle component analysis of the correlation matrix of the twenty-four items from the ADL survey. The dashed horizontal line corresponds to eigenvalues of 1. We use only the years for which all questions are available. Sample size: 143,913. Years: 2012–5.

The first component, labelled ‘social participation’ (SP), relates primarily to six questions about participation in and support for associations (i.e., voluntary, non-voluntary, environmental or civil rights, cultural or recreational).<sup>19</sup> The second component, labelled ‘political participation’ (PP) loads on seven questions about participation in and support for political parties and unions, and participation in different political activities besides voting (i.e., rallies, demonstrations, debates). The third component, labelled ‘general trust’ (GT), loads heavily on three questions about trust in other people, neighbours and strangers. Finally, the fourth component, labelled ‘institutional trust’ (IT), loads on eight questions concerning respondents’ trust in both national and supranational institutions (i.e., national and European parliament, local governments, political parties, judicial systems and the police).

The results of the PCA are quite stark: the loadings of each variable for the relevant component are generally an order of magnitude larger than those for the other components, suggesting the existence of four clearly distinct dimensions of social capital. This pattern is further confirmed by looking at the simple pairwise correlations reported in [Online Appendix Table A3](#), in which coefficients are much higher for variables associated with the same component than for variables associated with different components.

Based on these results, we aggregate the twenty-four original variables into four main social capital components (SP, PP, GT, IT). This can be achieved in two ways. One option is to estimate the PCA scores for each individual as the weighted sum of the original variables, where the

<sup>19</sup> Putnam (1993) considered associational activity as a crucial component of social capital, generally beneficial to society. An opposing view was put forth by Olson (1982), who considered associations as the expression of special interests, pursuing private objectives potentially at odds with the broader interest of society. Knack (2003) summarised this debate and provided some empirical evidence based on cross-country data.

Table 1. *PCA Results: Four Components of Social Capital.*

ID	Social participation	Political participation	General trust	Institutional trust	Unexplained
SP1: Gives money to voluntary assoc	<b>0.315</b>	0.079	0.137	-0.011	0.622
SP2: Non-paid activity for voluntary assoc	<b>0.534</b>	-0.052	-0.029	0.004	0.342
SP3: Non-paid activity for non-voluntary assoc	<b>0.337</b>	0.038	-0.021	-0.002	0.697
SP4: Attend meeting of voluntary assoc	<b>0.528</b>	-0.050	-0.044	0.007	0.358
SP5: Attend meeting of enviro or civil right assoc	<b>0.243</b>	0.109	-0.026	0.003	0.784
SP6: Attend meeting of cultural or recreational assoc	<b>0.385</b>	0.063	0.042	-0.003	0.561
PP1: Attend political rally	-0.041	<b>0.431</b>	-0.021	-0.005	0.567
PP2: Participate in demonstration	0.017	<b>0.326</b>	-0.030	-0.011	0.730
PP3: Listens to political debate	0.039	<b>0.322</b>	0.099	-0.013	0.681
PP4: Gives money to political party	-0.051	<b>0.402</b>	0.005	0.017	0.624
PP5: Non-paid activity for political party	-0.046	<b>0.425</b>	-0.060	0.014	0.583
PP6: Non-paid activity for trade union	-0.030	<b>0.300</b>	-0.024	0.001	0.792
PP7: Attend meeting of party and trade unions	0.048	<b>0.371</b>	0.054	-0.012	0.604
GT1: Can trust most people	-0.004	0.014	<b>0.525</b>	0.008	0.549
GT2: Neighbour will give back wallet	-0.008	-0.021	<b>0.567</b>	-0.006	0.497
GT3: Stranger will give back wallet	-0.021	-0.004	<b>0.588</b>	-0.010	0.461
IT1: Trust in Italian parliament	-0.019	0.002	-0.033	<b>0.392</b>	0.255
IT2: Trust in the EU parliament	0.008	0.008	-0.003	<b>0.374</b>	0.308
IT3: Trust in local government (regional)	0.017	-0.013	-0.012	<b>0.403</b>	0.201
IT4: Trust in local government (provincial)	0.023	-0.022	-0.014	<b>0.401</b>	0.210
IT5: Trust in local government (municipal)	0.037	-0.021	0.041	<b>0.330</b>	0.434
IT6: Trust in political parties	-0.032	0.062	-0.039	<b>0.358</b>	0.369
IT7: Trust in the judiciary system	-0.023	0.017	0.045	<b>0.307</b>	0.511
IT8: Trust in the police	-0.009	-0.030	0.091	<b>0.227</b>	0.707

Notes: The table presents results from a principal component analysis of the twenty-four social capital-related variables in the ADL survey. In particular, it reports the loadings, after orthogonal varimax rotation, indicating how much each variable contributes to a particular principal component (loadings with value above |0.2| are reported in bold). The last column reports the share of variance in each original variable left unexplained after the PCA. The fraction of the variance explained by each component is as follows: IT = 0.206, SP = 0.104, PP = 0.104, GT = 0.067. We use only the years for which all questions are available. Sample size: 143,913. Years: 2012–5.

weights are the PCA loadings. An alternative, and arguably more intuitive approach, is to assign each variable to one component based on its highest loading, and then compute the arithmetic average of all variables associated with each component.<sup>20</sup> The measures produced with these two approaches are highly correlated with each other (0.95). To facilitate the interpretation of the results, in the remainder of our analysis, we use the simple averages.

Pooling all years together, we can compute the social participation index for about 604,000 individuals and the political participation index for about 607,000 (since the relevant questions are available for the whole 2000–15 period). We can construct the general trust and the institutional trust indexes for only 231,400 and 151,500 individuals, since the relevant questions are only asked starting in 2010 and 2012, respectively.<sup>21</sup> In what follows, we refer to these indices as components or dimensions of social capital.

Online Appendix Figure A2 shows the evolution of the four components over time. Overall, they remain fairly stable throughout the period of analysis. Political and social participation show similar trends until 2013, when they start to evolve differently. General trust appears as the most stable dimension, with a slight positive uptick in 2014. Finally, the time series for institutional trust is too short to detect any meaningful trends.

<sup>20</sup> In doing so we re-scale the original variables so that each resulting measure ranges between 0 and 1.

<sup>21</sup> We drop individuals with missing responses to one or more of the questions. However, including them does not affect our results.

Table 2. *Correlations among Social Capital Components.*

	Social participation	Political participation	General trust	Institutional trust
Social participation	1.000			
Political participation	0.379*	1.000		
General trust	0.215*	0.137*	1.000	
Institutional trust	0.052*	0.046*	0.227*	1.000

*Notes:* The table reports pairwise correlations between the four components of social capital. Correlation coefficients significant at the 0.05 level or higher are indicated with an asterisk. The correlations are calculated on the sample of 143,913 individuals who have a value for each of the four components. Calculating the correlations between components that are available for a longer span of years, i.e., social and political participation, yields almost identical results.

## 2.2. Relationships between Social Capital Components

Next, we explore how the different components of social capital introduced in the previous section correlate with one another and with various socio-demographic characteristics at the individual level.

Table 2 reports the pairwise correlation coefficients between the four social capital components. None of the coefficients is larger than 0.40, and some are around or below 0.10.<sup>22</sup> To further explore these relationships, in Figure 2 we plot the conditional distributions of each of the four components. As shown in panel (a), social participation is positively correlated to political participation (correlation coefficient of 0.379) and, to a lower extent, to general trust (0.215), while the correlation with institutional trust is rather low (0.052). As shown in panel (b), political participation is only weakly correlated with general trust (0.137) and even less with institutional trust (0.046). Institutional trust is weakly correlated with all other components including general trust (0.227). The graphical evidence also indicates that the relationships between the various components are largely linear. Panels (a) and (b) also report the unconditional distribution of the social participation variable and of the political participation variable, respectively.<sup>23</sup>

Thus, although participation in social activities, participation in political activities and trust in others are positively correlated, each of these variables appears to capture a distinct facet of social capital.

## 2.3. External Validity: Evidence from the World Values Survey

To confirm that the patterns observed in the ADL survey apply beyond Italy, we replicate the principal component analysis using data from the World Values Survey. In particular, we focus on the 2010–12 round, which covers sixty countries, and use data on thirty-four survey questions on a range of social attitudes and behaviours. The results are reported in Table 3.

Interestingly, and perhaps surprisingly, four distinct components emerge that very much resemble those found in the ADL data. Looking at the loadings of the different variables, we see that, once again, most of the variables are clearly associated with one component, with the exception of five items that do not load heavily on any component (all loadings below 0.2).<sup>24</sup>

<sup>22</sup> Online Appendix Table A4 shows that calculating these correlations using the four PCA scores instead yields very similar results.

<sup>23</sup> Both are skewed to the left, which indicates that they capture activities many respondents are unlikely to engage in.

<sup>24</sup> Following the same approach used for the ADL data, we compute the four measures of social capital as the arithmetic average of the variables that display the highest loadings on the respective component after rescaling them between 0 and

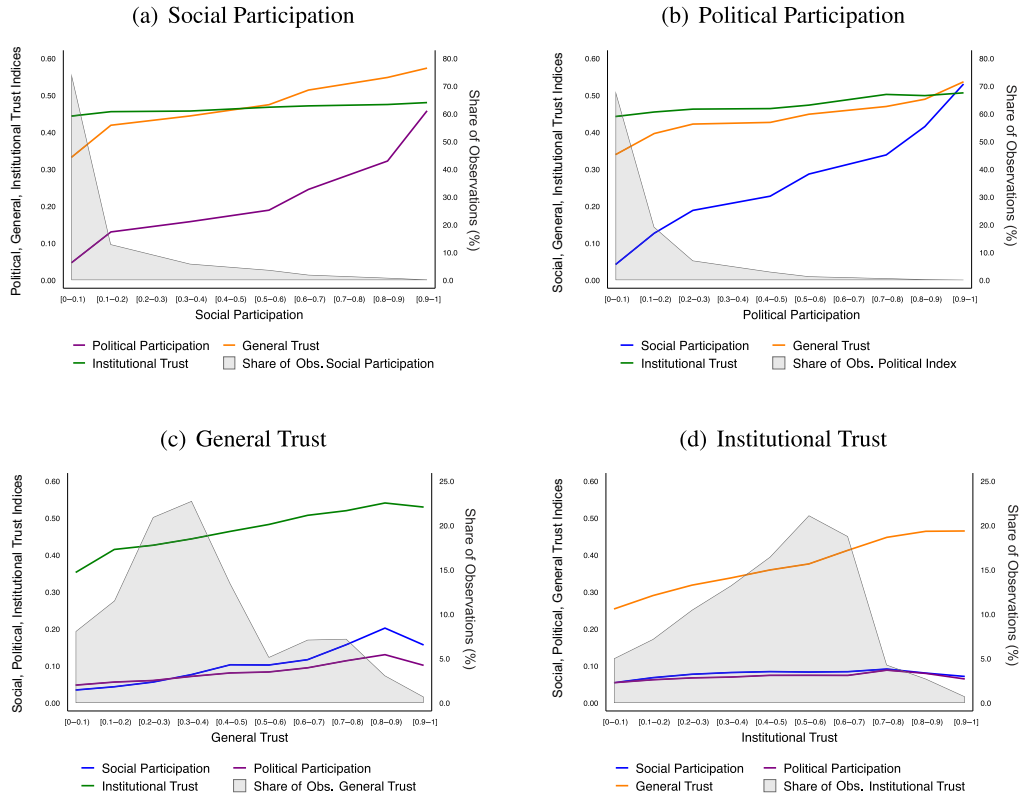


Fig. 2. Conditional Distributions of Social Capital Components.

Notes: The figure reports the distributions of the four social capital components conditional on each of the other ones. Components are re-scaled to range from 0 to 1, and conditional distributions are calculated over ten equally spaced bins of the conditioning variable. The figure also reports the unconditional distributions (in grey shades) based on the same bins. The sample is formed by 143,913 individuals for whom it is possible to calculate a value for all four components (individuals sampled from 2012 onward).

The results are also remarkably similar to those found for the Italian data when looking at the pairwise correlation between components (Table 4) and at the conditional distributions (Figure 3). Once again, each component is only weakly correlated with the others, and the highest correlation is between social participation and political participation (0.251). In this case, however, general trust displays a lower correlation with both social and political participation (0.127 and 0.140, respectively) and slightly higher with institutional trust (0.261).

### 3. Correlates of Social Capital

In this section we explore how the different dimensions of social capital identified above correlate with a range of socio-demographic characteristics. To shed light on what individual and

1. In doing so, we exclude five variables with no loading above 0.2 and restrict the sample to respondents who answered all the remaining twenty-nine questions.

Table 3. *World Values Survey: PCA Results.*

ID	Social participation	Political participation	General trust	Institutional trust	Unexplained
SP1: <i>Active/inactive membership of sport or recreation</i>	<b>0.266</b>	0.017	-0.006	0.005	0.670
SP2: <i>Active/inactive membership of art, music, educational</i>	<b>0.302</b>	0.007	-0.008	-0.001	0.585
SP3: <i>Active/inactive membership of labour unions</i>	<b>0.284</b>	0.009	0.008	0.004	0.625
SP4: <i>Active/inactive membership of political party</i>	<b>0.259</b>	0.043	-0.002	0.036	0.653
SP5: <i>Active/inactive membership of environmental organisation</i>	<b>0.360</b>	-0.028	-0.005	-0.004	0.435
SP6: <i>Active/inactive membership of professional organisation</i>	<b>0.328</b>	-0.007	0.013	-0.018	0.519
SP7: <i>Active/inactive membership of charitable/humanitarian organisation</i>	<b>0.337</b>	-0.005	0.013	-0.019	0.492
SP8: <i>Active/inactive membership of consumer organisation</i>	<b>0.356</b>	-0.040	0.007	-0.003	0.451
SP9: <i>Active/inactive membership of self-help group, mutual aid group</i>	<b>0.329</b>	-0.029	-0.022	0.010	0.529
SP10: <i>Active/inactive membership of any other organisation</i>	<b>0.272</b>	0.009	0.017	0.005	0.655
PP1: <i>Political action: signing a petition</i>	-0.012	<b>0.402</b>	0.034	-0.011	0.461
PP2: <i>Political action: joining in boycotts</i>	-0.011	<b>0.429</b>	0.029	-0.006	0.388
PP3: <i>Political action: attending lawful/peaceful demonstrations</i>	-0.005	<b>0.436</b>	-0.012	-0.002	0.380
PP4: <i>Political action: joining unofficial strikes</i>	-0.005	<b>0.436</b>	-0.024	0.005	0.384
PP5: <i>Political action: other</i>	-0.007	<b>0.449</b>	-0.003	-0.006	0.342
PP6: <i>Past two years: given money to ecological organisation</i>	0.107	0.085	0.027	0.012	0.896
PP7: <i>Past two years: participated in demonstration for environment</i>	0.109	0.118	-0.030	0.017	0.875
PP8: <i>Interest in politics</i>	0.039	0.161	0.037	0.077	0.849
GG1: <i>Most people can be trusted</i>	0.001	0.021	<b>0.217</b>	-0.002	0.864
GG2: <i>Trust: your neighbourhood</i>	-0.011	-0.081	<b>0.381</b>	0.031	0.577
GG3: <i>Trust: people you know personally</i>	-0.025	-0.019	<b>0.405</b>	0.012	0.545
GG4: <i>Trust: people you meet for the first time</i>	0.026	0.010	<b>0.442</b>	-0.025	0.456
GG5: <i>Trust: people of another religion</i>	0.012	0.035	<b>0.432</b>	-0.006	0.460
GG6: <i>Trust: people of another nationality</i>	-0.003	0.037	<b>0.450</b>	-0.016	0.430
GG7: <i>Do you think most people try to take advantage of you?</i>	0.029	-0.028	0.109	0.052	0.940
GG8: <i>Trust: your family</i>	-0.043	-0.065	0.192	0.023	0.878
IT1: <i>Confidence: armed forces</i>	-0.028	-0.007	0.021	<b>0.285</b>	0.669
IT2: <i>Confidence: the police</i>	-0.014	-0.014	0.026	<b>0.345</b>	0.511
IT3: <i>Confidence: justice system/courts</i>	-0.008	0.012	-0.012	<b>0.382</b>	0.428
IT4: <i>Confidence: the government</i>	0.002	-0.036	-0.022	<b>0.390</b>	0.406
IT5: <i>Confidence: parliament</i>	0.015	-0.013	-0.017	<b>0.390</b>	0.399
IT6: <i>Confidence: the civil services</i>	0.004	-0.006	0.015	<b>0.364</b>	0.461
IT7: <i>Confidence: regional organisation (e.g., EU, NAFTA, AU, etc.)</i>	-0.001	0.031	-0.017	<b>0.324</b>	0.585
IT8: <i>Confidence: the United Nations</i>	0.003	0.035	-0.006	<b>0.313</b>	0.606

Notes: The table presents results from a principal component analysis of the thirty-four social capital-related variables in the WVS. In particular, it reports the loadings, after varimax rotation, indicating how much each variable contributes to a particular principal component (loadings with value above |0.2| are reported in bold). The last column reports the share of variance in each original variable left unexplained after the PCA. Sample size: 42,760.

Table 4. *World Values Survey: Correlation among Social Capital Components.*

	Social participation	Political participation	General trust	Institutional trust
Social participation	1.000			
Political participation	0.251*	1.000		
General trust	0.127*	0.140*	1.000	
Institutional trust	0.129*	0.018*	0.261*	1.000

Notes: The table reports pairwise correlations at the individual level between the four components of social capital. Correlation coefficients significant at the 0.05 level or higher are indicated with an asterisk. The correlations are calculated on the sample of 43,567 individuals who answered all underlying questions.

community characteristics are associated with higher levels of social capital, we perform the analysis separately at the individual level and at the aggregate (provincial) level.

### 3.1. Individual Characteristics and Social Capital

To gauge the relationship between social capital and individual characteristics, we regress each of the four dimensions (SP, PP, GT, IT) on a number of individual-level variables. To facilitate

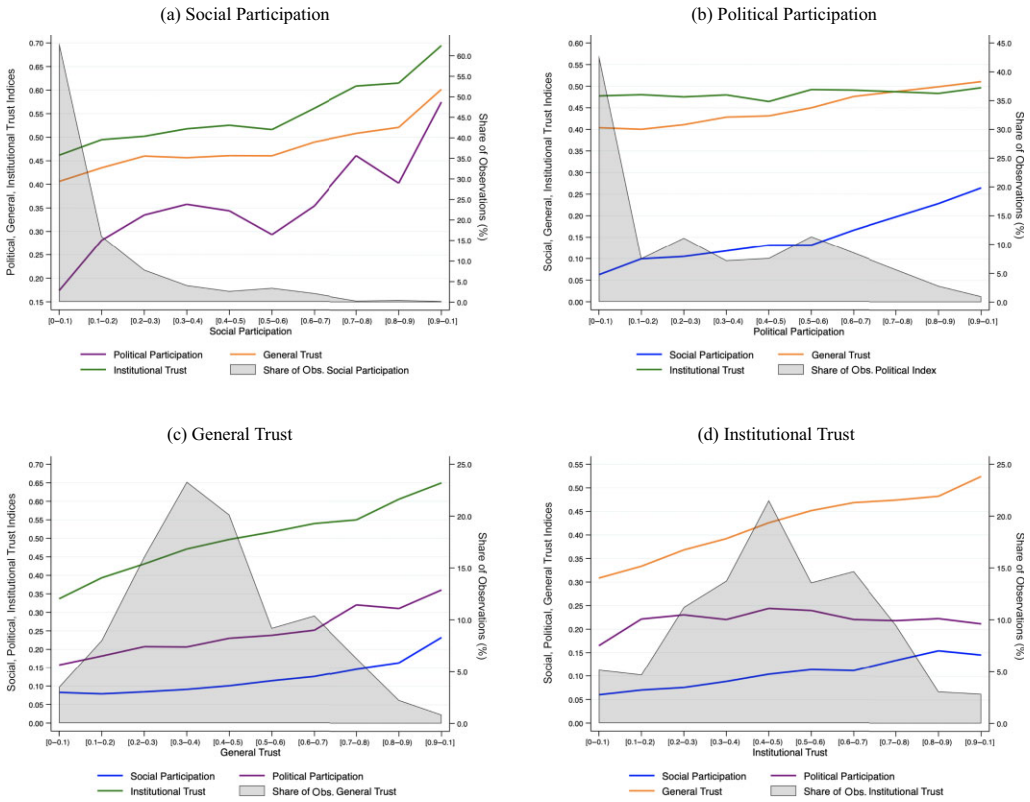


Fig. 3. World Values Survey: Conditional Distributions of Social Capital Components.

Notes: The figure reports the distributions of the four social capital components conditional on each of the other ones. Components are re-scaled to range from 0 to 1, and conditional distributions are calculated over ten equally spaced bins of the conditioning variable. The figure also reports the unconditional distributions (in grey shades) based on the same bins. The sample is formed by 43,567 individuals for whom it is possible to calculate a value for all four components.

comparisons, all measures of social capital are standardised to have a mean of 0 and an SD of 1. The results are summarised graphically in Figure 4, while the corresponding estimates are reported in Online Appendix Table A5.<sup>25,26</sup>

There is a clear positive relationship between social capital and education, regardless of what dimension of social capital one looks at. In particular, holding a high school degree or higher is associated with a noticeably higher level of social and political participation (37% and 32% of an SD, respectively), and with higher trust both in others and, to a lower extent, in institutions (29% and 8.5% of an SD, respectively).

<sup>25</sup> Also, in Online Appendix Table A7 we replicate the analysis including an indicator to control for the north-south divide. In Online Appendix Table A6 we replicate the analysis using as outcome variables the PCA scores, and results are unchanged.

<sup>26</sup> The sample size varies depending on the outcome variable since the questions on which each component is based were asked in different years. That said, the results are similar when restricting the sample to individuals who answered all relevant questions. The results are also robust to the inclusion of province and year fixed effects.

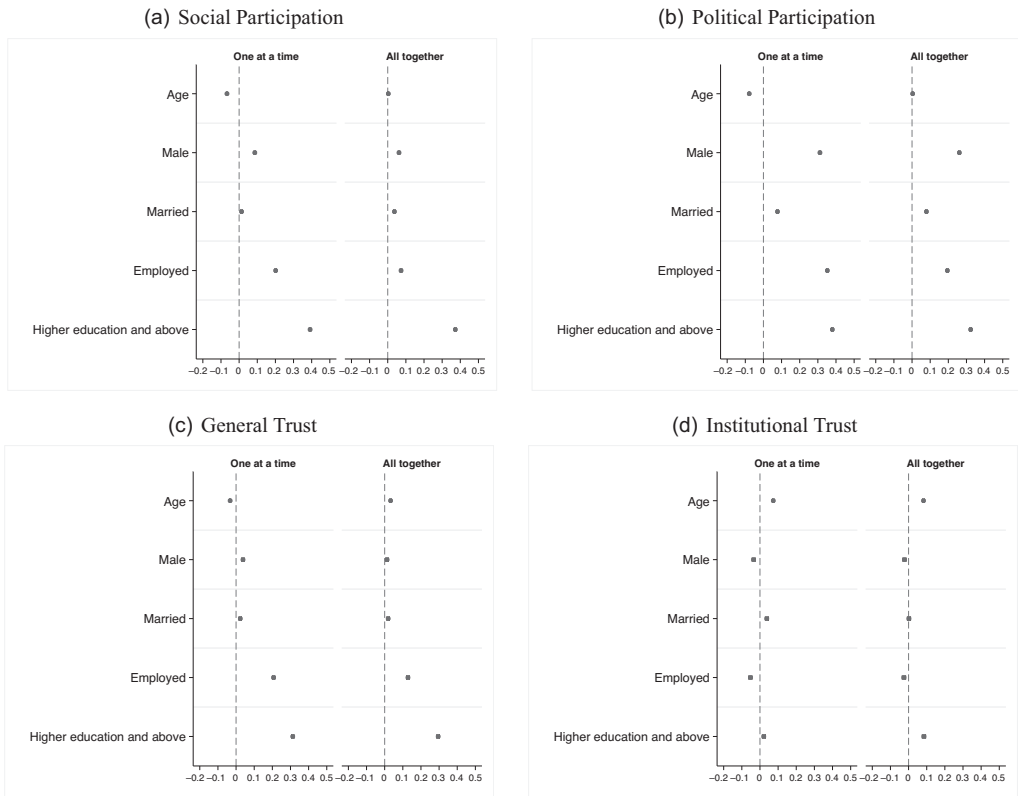


Fig. 4. Individual-Level Correlates of Social Capital Components.

Notes: The figure reports estimated coefficients and 95% confidence intervals from regressing each of the four social capital components on a number of individual characteristics. (Because of the large sample size, the 95% confidence intervals are too small to be visible.) Each panel reports both estimates from regressions in which controls are included one at a time, and regressions in which they are included simultaneously. The four social capital measures are standardised to have mean 0 and SD 1. The sample size is 588,989 for panel (a), 591,788 for panel (b), 231,387 for panel (c) and 151,351 for panel (d).

Being employed is also associated with significantly higher levels of political participation and somewhat higher levels of social participation and general trust, but not institutional trust. Gender also seems to matter: male respondents display higher political participation and somewhat higher social participation than female respondents. While general and institutional trust do not differ sensibly between genders. Married people also display higher scores on all four variables, though the coefficients are rather small. Other characteristics exhibit more mixed patterns. For example, age displays a positive correlation with institutional trust and (to a lesser extent) general trust, but no correlation with social or political participation.

Although we cannot attach any causal interpretation to these results, the fact that the correlation with individual characteristics varies sensibly for different dimensions of social capital further attests to the multi-faceted nature of social capital. The patterns also suggest that researchers should carefully explore how the specific dimension of social capital they are interested in relates to personal characteristics.

### 3.2. *Community Characteristics and Social Capital*

Because social capital is ultimately a societal phenomenon, it is also instructive to examine how its different components relate to community characteristics by aggregating the survey data at some appropriate geographical level. Indeed, the relationship between socio-demographic characteristics and social capital may well differ when looking at the individual level and the aggregate level. For example, the fact that more educated individuals are more participative and trusting might not necessarily imply that communities with a higher share of educated people display higher levels of social capital.

To examine this aspect, we collapse the ADL data by province (Italy has 110 provinces). We focus on the provincial level for three reasons. First, it is sufficiently granular to capture the type of social interactions central to the concept of social capital, but sufficiently large that the ADL data can provide an accurate picture at that level. Second, examining the provincial level facilitates the comparison of our results with those from previous studies on social capital in Italy, most of which use the province as the unit of analysis. Third, when we compare the ADL data collapsed to the province level with official census data on key demographic and socio-economic variables, we find that the ADL samples appear to be largely representative of the population (see [Online Appendix Figure A1](#)).

The four panels of [Figure 5](#) show the distribution of each of the four components of social capital across Italian provinces. The first pattern that emerges is that the level of social capital varies considerably across different areas of the country. These geographical differences have been documented in previous work (Putnam *et al.*, 1993; Bigoni *et al.*, 2018) and have been traced back to important historical experiences (Guiso *et al.*, 2016). The second and perhaps more unexpected result is that the geographical distribution differs quite considerably across different dimensions of social capital. For example, while there is a clear north-south divide in social participation and general trust (panels (a) and (c)), this geographical gradient is less visible for institutional trust and, especially, for political participation (panels (b) and (d)).

Regarding the relationship between the different components of social capital at the province level, in [Table 5](#), we report the pairwise correlations between the four variables. Overall, the generally positive correlation between the four components is confirmed at the aggregate level, but with a few interesting differences. While at the individual level, the highest correlation was between social and political participation, at the aggregate level, the highest correlation is observed between general trust and social participation. The correlation between social participation and both general and institutional trust is higher at the provincial level than at the individual one (0.79 versus 0.22 in the case of general trust and 0.39 versus 0.05 in the case of institutional trust), while the correlation between political participation and the other measures is lower at the aggregate than at the individual level.

Next, we examine the relationship between the four dimensions of social capital and several demographic, economic and social characteristics at the province level available from the 2011 Italian census: age structure, educational level, unemployment rate, the share of house ownership, immigrant share and population density. We regress each of the four social capital measures on provincial-level characteristics and a dummy for northern provinces to account for the north-south gradient uncovered in [Figure 5](#). The estimates are summarised graphically in [Figure 6](#) and reported in [Online Appendix Table A8](#) (including those from univariate regressions in which each explanatory variable is included one at a time).

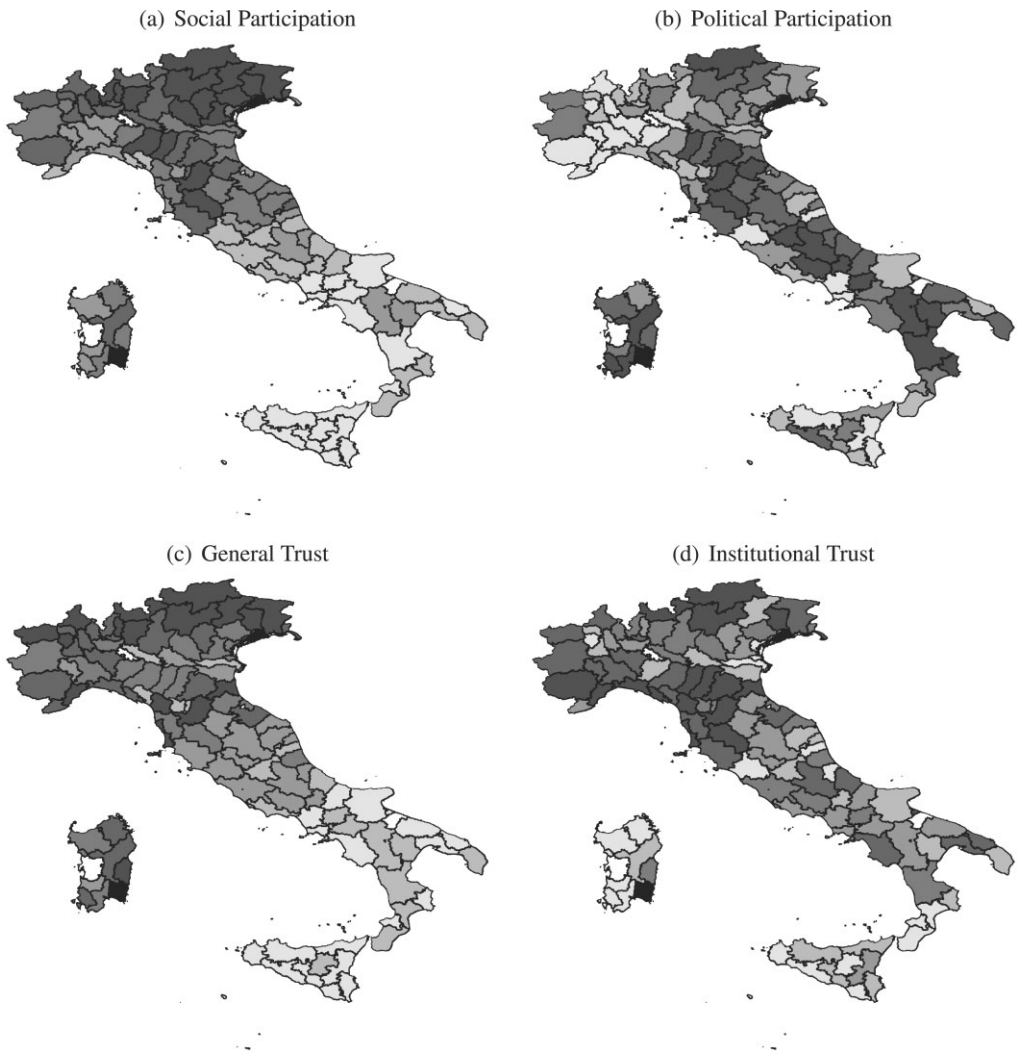


Fig. 5. *Geographical Distribution of Social Capital Components.*

*Notes:* The panels show the distribution of social capital across Italy. Provinces are coloured according to their level of social capital, going from the first (lighter) to the sixth sixthile (darker) of each social capital component.

The average level of education in the province does not seem to be a robust determinant of social capital. Although there is a positive relationship between education and social capital when we do not control for any other characteristics, the coefficients become insignificant when these are included (except for the case of political participation). This contrasts with the individual-level analysis above, where education plays a major role as a predictor of social capital. These differences suggest that, within a given area, more educated individuals tend to be especially engaged and socially active, but that the presence of a larger share of such individuals does not

Table 5. *Correlation between Social Capital Components at the Province Level.*

	Social participation	Political participation	General trust	Institutional trust
Social participation	1			
Political participation	0.229*	1		
General trust	0.799*	0.098	1	
Institutional trust	0.391*	0.131	0.477*	1

*Notes:* The table reports pairwise correlations between the four components of social capital. The correlations are calculated on the sample of 110 provinces. Correlation coefficients significant at the 0.05 level or higher are indicated with an asterisk.

necessarily boost the overall level of social capital.<sup>27</sup> Next, less favourable economic conditions, such as high unemployment rates, appear to be detrimental for social capital, except for the political participation dimension. This suggests that economic crises might erode, not only physical, but also social capital, amplifying their detrimental effects on the society, a conjecture confirmed by the evidence by Ananyev and Guriev (2019), who documented a consistent drop in social trust following the 2009 economic crisis in Russia.

Interestingly, provinces with a higher share of foreign immigrants display lower levels of both general trust and institutional trust (controlling for other province characteristics), a finding that speaks to the recent evidence on the link between immigration and social cohesion (e.g., Albarosa and Elsner, 2023). Different factors could explain this correlation. First, immigrants may have lower social capital than natives. Second, they may sort disproportionately into areas with lower social capital. Finally, the presence of immigrants may decrease social capital among natives. Our findings being purely descriptive, unfortunately do not allow us to disentangle between these different explanations.

Finally, it is interesting to look at the relationship between population density and social capital that is a priori unclear. Indeed, while on the one hand cities provide more opportunities to socialise with other people, on the other hand small towns might facilitate personal connections and foster trust among inhabitants. We find that, when controlling for other characteristics, provinces with lower population density do not have higher levels of trust or social participation, but display higher levels of political participation. One possible interpretation of this finding is that opportunities for political participation—such as attending meetings of a political party—might be available even in small towns, and they might be used by individuals as a substitute for other types of amenities, such as theatres or cinemas, which are less available at the local level.

The fact that different province characteristics relate in a different way to the various dimensions of social capital underlines how such dimensions are, not only distinct, but also have different determinants. Finally, some of the discrepancies between the results of the individual- and province-level regressions speak to the differential impact on the social capital of individual versus community characteristics, and to the view of social capital as the product of an inherently collective process. These findings also stress the need for empirical researchers to think carefully about the most appropriate level of analysis for the specific question at stake, and suggest caution in the use of aggregate measures as controls in the individual-level regressions.

<sup>27</sup> This also connects with recent work by Cabrales and Hauk (2024) examining the role of leaders for social norms.

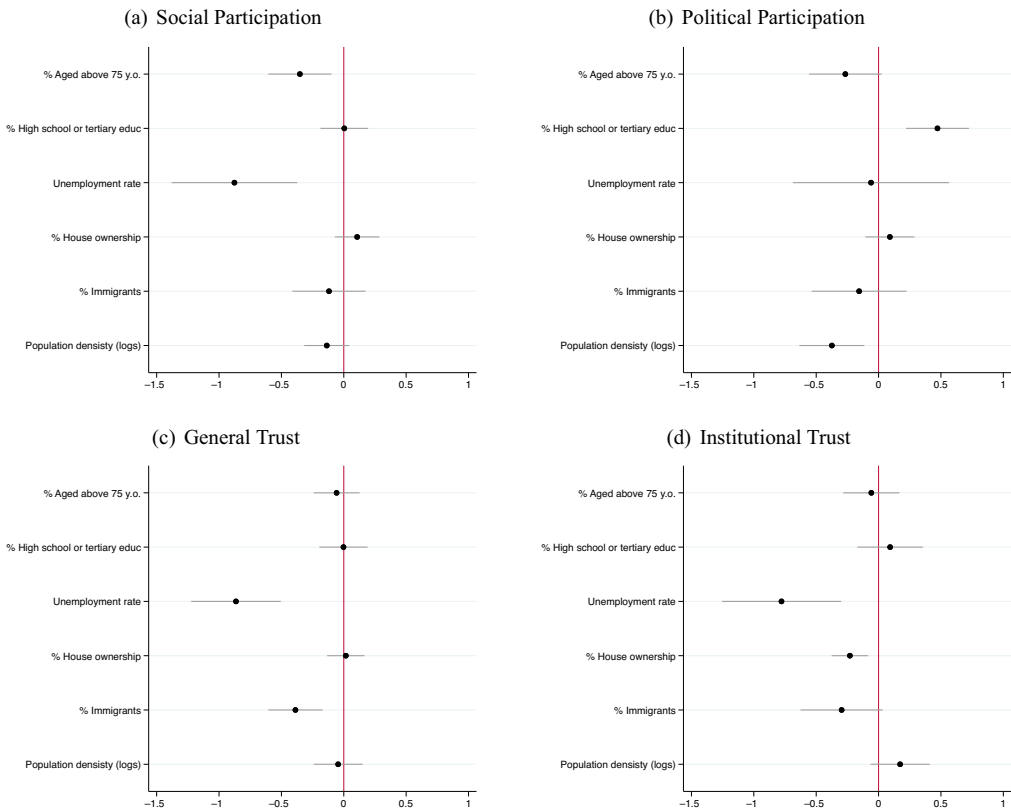


Fig. 6. Province-Level Correlates of Social Capital Components (Multivariate).

*Notes:* The figure reports estimated coefficients (and 95% confidence intervals). It explores the provincial-level correlates of social capital dimensions. The outcome variables are our four standardised ADL survey social capital dimensions that we describe in Section 3.1. We regress them on a set of socio-demographic characteristics from the Italian census (8000 Census database, <https://ottomilacensus.istat.it>). % Aged above 75 y.o. represents the share of people older than 75 years old. % High school or tertiary educ represents the share of people with at least a higher degree qualification. Unemployment rate captures the share of unemployed people. % House ownership captures the share of households owning a residential property. % Immigrants captures the share of foreign-born individuals. Population density measures the density of inhabitants in each province. All variables are standardised. The sample is composed of 110 Italian provinces. All estimates control for an indicator *north* to capture the north-south divide exemplified in Figure 5. All regressions have robust SEs.

#### 4. Relation with Standard Measures of Social Capital

As mentioned above, a number of variables have been used in the literature to proxy for social capital. In this section, we explore the relationship between the four dimensions of social capital based on the ADL data and a set of variables commonly used in previous work on Italy (and other countries).

We focus on the following variables, all available at the province level: the density of non-profit organisations, turnout in national elections, turnout in local elections, turnout in national referenda, newspaper readership, blood donations and a measure of cheating constructed from

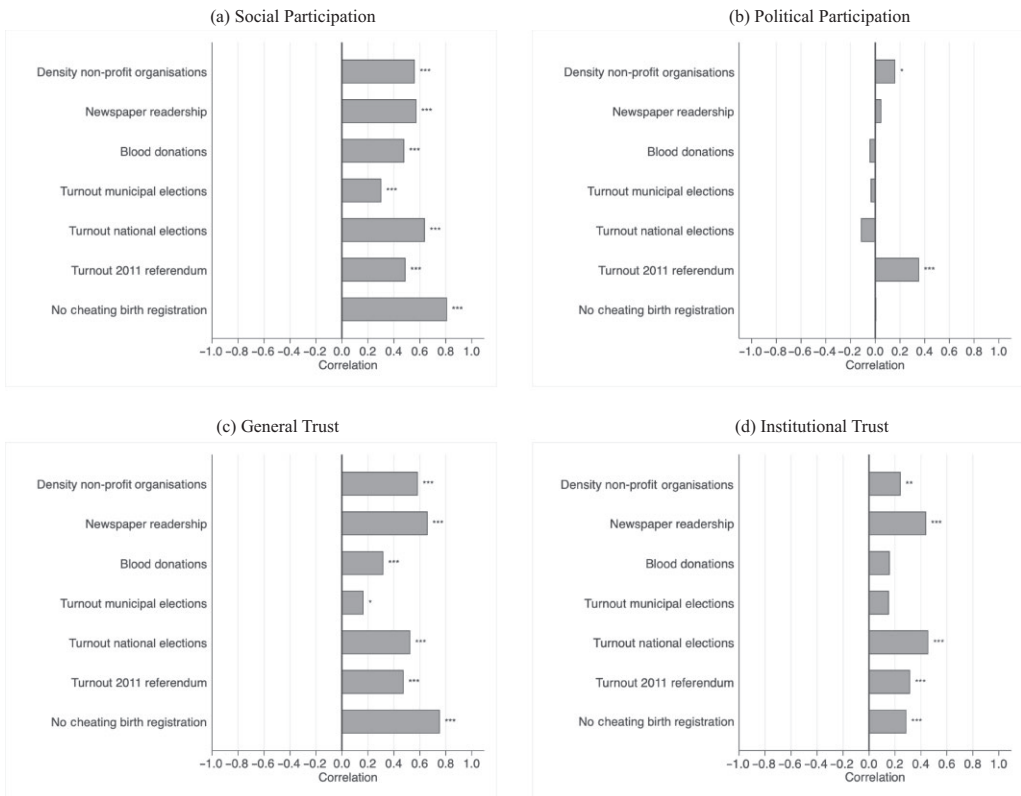


Fig. 7. Correlation of ADL-Based Social Capital Components with Other Existing Measures.

Notes: The figure reports pairwise unconditional correlations between ADL-based components of social capital and a set of existing measures that have been used in the literature. Information on the density of non-profit organisations comes from the ‘Atlante Storico dei Comuni’ and is available for 110 provinces; information on newspaper readership comes from ADS (as described in the data section) and is available for 105 provinces; blood donation refers to the number of blood bags per million inhabitants and is available for ninety-nine provinces; information on turnout in municipal and national elections comes from the Italian Ministry of Interior (average turnout for all municipal and national elections between 1993 and 2014) and is available for 108 provinces; information on turnout in the 2011 referendum also comes from the Italian Ministry of Interior and is available for 110 provinces; cheating on birth date is a measure developed by Anelli *et al.* (2023) based on the 1991 census and is available only for the set of ninety-five provinces existing in 1991. All remaining variables are available for the entire sample of 110 Italian provinces. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

the 1991 census and capturing the frequency of birth date misreporting (see the Table A9 note for more details).<sup>28</sup>

Figure 7 reports the pairwise correlations between these variables and each of our four survey-based measures of social capital. Furthermore, to account for the north-south divide in social capital exemplified in Figure 5, we also report correlations between residualised ver-

<sup>28</sup> Using data from the 1991 Italian census for cohorts born between 1921 and 1954, Anelli *et al.* (2023) documented a significant tendency in some localities to record births occurring in December of a given year as occurred in January of the following year. This behaviour—primarily aimed at delaying school entry and compulsory military service—can be seen as a proxy for the propensity to cheat and for the level of dishonesty of the relevant population.

sions of the above-mentioned variables, after controlling for a north versus south indicator (Online Appendix Figure A3). The pattern that emerges is quite mixed. Social participation correlates positively with all variables and most of the coefficients are fairly large. Reassuringly, one of the highest correlations is with the presence of non-profit organisations, which should best reflect the type of activities the ADL questions on social participation are meant to capture. On the other hand, political participation displays a weak correlation with all variables, except for turnout in referenda, the density of non-profit organisations and newspaper readership (when controlling for the north-south divide). The fact that the political participation dimension of social capital does not correlate highly with electoral turnout—either at the local or at the national level—is consistent with the hypothesis that participation in referenda is mainly driven by civic duty, while turnout in regular elections also depends on evaluations of the incumbent’s performance, partisan considerations and mobilisation efforts. General trust is also positively correlated with most of the commonly used proxies, but with considerable heterogeneity—e.g., a correlation of 0.17 with municipal election turnout, and 0.75 with the inverse measure of cheating constructed by Anelli *et al.* (2023). Finally, institutional trust correlates mostly with newspaper readership and turnout at a national referendum, but displays little or no correlation with blood donations, which is in fact one of the most commonly used proxies of social capital. Furthermore, looking at Figure 7 and Online Appendix Table A9, remarkable is the case of blood donations, which is significantly correlated only with social participation, general trust and newspaper readership (though no coefficient is above 0.5). Yet, with the exception of social participation, all these correlations become insignificant once we control for an indicator ‘north’ to capture the north-south divide (Online Appendix Figure A3 and Table A10). This suggests that, more than for other measures of social capital, variation in blood donations is mainly related to the north-south divide.

We also examine the pairwise correlations among commonly used measures, which are shown in Online Appendix Table A9. Here too, the picture is mixed. The correlations are often weak, and generally weaker than those using the survey-based measures of social participation and general trust. Once again, one striking example is the correlation between the number of non-profit associations per capita and blood donation rates, which is only 0.1, and drops to 0.01 when we condition the correlation on the north-south divide (Online Appendix Table A10).

Reversing the perspective, the results in Figure 7 can help evaluate what dimension(s) of social capital does (do) each proxy variable capture. For example, the number of non-profit associations is strongly related to social participation, but not with political participation, trust in others or trust in institutions. Cheating on birth-date registration is highly correlated with social participation and trust in others, but not with political participation or trust in institutions. Finally, turnout in local elections does not show any strong correlation with any of the four survey-based measures and is hence likely to capture some other dimension. These results suggest that the choice of the specific proxy to use in empirical work needs to be carefully guided by the specific dimension of social capital one is interested in, as different proxies capture different dimensions.

## 5. Revisiting Existing Studies

To assess more systematically how our measures of social capital fare relative to standard proxies used in the literature, in this section we revisit two previous influential articles: Guiso *et al.* (2004) and Buonanno *et al.* (2009) on the impact of social capital on financial development and crime, respectively. Both papers study Italy and use standard measures of social capital based on administrative data or other sources of data, such as turnout in referenda, blood donations

and the number of voluntary associations. In both papers, the analysis is performed at the province level—the same level of aggregation we have used so far—making the comparison straightforward.

The main conclusion we draw from our re-analyses is that different aspects of social capital matter for different outcomes. To highlight this argument, we focus on the main specification used in each paper, setting aside the many interesting details, variations and extensions they contain.

### 5.1. *Social Capital and Financial Development (Guiso, Sapienza and Zingales, 2004)*

In their 2004 *American Economic Review* article, Guiso, Sapienza and Zingales (henceforth GSZ) studied the relationship between social capital and financial development. Looking at Italy, they documented that in provinces with higher levels of social capital individuals are more likely to use modern financial instruments and less likely to keep their wealth in cash and ask for loans from family and friends. They interpreted these findings as evidence that social capital, by favouring the emergence of a culture of mutual trust, increases people's willingness to enter into arms-length contractual agreements, including sophisticated financial instruments.<sup>29</sup>

GSZ employed two measures of social capital at the province level: turnout in referenda and blood donations. Regarding the outcomes, they looked at four measures of financial development at the household level: (i) the probability of using checks, (ii) the probability of asking for loans from family and friends, (iii) the share of total wealth invested in stocks and funds and (iv) the share of total wealth kept in cash. Data on these outcomes are available from a survey on financial behaviour conducted by the Bank of Italy every two years between 1989 and 1995.<sup>30</sup> For our analysis, we construct a single index of financial development by computing the average of the five original measures.<sup>31</sup>

Table 6 reports the results of the regressions. To facilitate the comparison across rows and columns, all variables are standardised to have a mean of 0 and an SD of 1. We mimic GSZ's most complete specification and include in all regressions the same battery of individual- and province-level controls they used, as well as year fixed effects and five macro-region dummies. As in GSZ, results are robust to a variety of alternative specifications.

Columns (1) and (2), which mirror the paper's original results, show that both blood donations and turnout in referenda display a strong positive relationship with the financial development index. In columns (3)–(6), we regress the same dependent variable on the four survey-based components, one at a time. Three of them—social participation, political participation and general trust—show a positive and significant coefficient, while institutional trust does not.

In the last three columns, we perform a horse race between the different measures of social capital against each other. The results in column (7) show that the coefficients on blood donations and turnout in referenda are significant even when these variables are included simultaneously. In column (8), we include the four survey-based components at once; while the coefficients on general trust and political participation remain stable and significant, the effect of social participation shrinks in magnitude and precision. In column (9), we finally include all six measures

<sup>29</sup> This concept is generalised by Zak and Knack (2001), who proposed a general equilibrium growth model with heterogeneous agents that illustrates how low-trust environments are characterised by lower rates of investment and slower growth.

<sup>30</sup> Hence, they refer to a period slightly before the 2000–15 period covered by the ADL data we use.

<sup>31</sup> Before computing the average, we re-coded some of the variables so that all are increasing measures of financial development.

Table 6. *Social Capital and Financial Development (GSZ replication).*

	Dependent variable: <i>Financial Development Index</i>								
	GSZ social capital measures		ADL survey social capital measures				All measures		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Turnout referenda (GSZ)	0.123*** (0.027)						0.091*** (0.031)		0.081*** (0.027)
Blood donation (GSZ)		0.067*** (0.013)					0.040** (0.016)		0.038** (0.015)
Social participation			0.042* (0.024)					-0.025 (0.031)	-0.033 (0.026)
Political participation				0.039** (0.016)				0.028* (0.015)	0.013 (0.017)
General trust					0.066*** (0.021)			0.052* (0.031)	0.059** (0.025)
Institutional trust						0.046*** (0.015)		0.021 (0.017)	0.022 (0.015)
Observations	32,332	32,332	32,332	32,332	32,332	32,332	32,332	32,332	32,332

*Notes:* The table reports OLS estimates of the *Financial Development Index* on various measures of social capital. *Financial Development Index* is the (standardised) simple average among the four outcome variables used in GSZ: an indicator for the use of checks; the share of family wealth in cash; the share of family wealth in stocks, a dummy equal to one if a family member got discouraged or turned down when applying for a loan or mortgage (as a measure of the availability of credit to consumers); an indicator for the household having some debts outstanding towards friends or relatives not living together (as a measure of informal credit market). The five variables above have been recoded so that all are increasing in *Financial Development*. *Turnout referenda* and *Blood donation* are the social capital measures used by GSZ. In particular, *Turnout referenda* is the voter turnout for all the referenda between 1946 and 1987 (before the beginning of the household data used for measuring financial development), while *Blood donation* is the number of blood bags per million inhabitants in 1995. *Social participation*, *Political participation*, *General trust* and *Institutional trust* are our usual measures of social capital components obtained from the ADL survey, as described in Section 3.1 All social capital variables are standardised to facilitate comparison of estimated coefficients. Following the original paper, all regressions include a set of province-level controls (judicial inefficiency, judicial inefficiency squared, per capita GDP, average years of education), as well as the following individual-level controls: family size, dummies for whether the household head is male, married, for his/her type of job and industry, calendar-year dummies, income, income squared, wealth, wealth squared, age, age squared, education. Furthermore, all regressions mimic the most complete specification in GSZ and include as controls four macro-regional dummies (north east, north west, centre and south). SEs are clustered at the province level and reported in parentheses. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

of social capital simultaneously. When doing so, we find that only turnout in referenda, blood donations and general trust display a significant coefficient, while political participation no longer shows a significant effect. Regarding the magnitudes, we find that a one-SD increase in blood donations is associated with a 0.04-SD increase in financial development, while for general trust, this value is slightly higher, i.e., 0.064.

The fact that general trust is significantly and robustly related to financial development very much confirms GSZ's view that trust in others—including strangers—is an important driver of financial decisions. The link between trust and financial development is, indeed, at the heart of the conceptual framework proposed by GSZ, so much so that the authors tried to test this relationship empirically using data from the World Values Survey. The WVS data, however, being sparser and only available at the regional level, provide a much coarser and noisier measure than the one we use.

Regarding the impact of political variables, it is interesting to note that the coefficient on referenda turnout remains significant even when controlling for political participation, which, instead, displays no significant effect. This suggests that financial development may be more related to the propensity to vote than to the more intense forms of political engagement captured by the survey question.

Finally, the coefficient on blood donations remains significant even when we include all of the survey-based measures of social capital in the model. One interpretation of this finding is that

blood donations measure is capturing some other facet of social capital, or another factor such as altruism, that has an independent effect on financial development.<sup>32,33</sup>

## 5.2. *Social Capital and Crime (Buonanno et al., 2009)*

In their 2009 *Journal of Law and Economics* study, Buonanno, Montolio and Vanin (henceforth BMV) investigated the link between social capital and crime. Using province-level data from Italy, they found that areas characterised by higher levels of social capital recorded lower crime rates. The authors used four measures of social capital: blood donations, turnout in referenda, the number of non-profit associations (per capita) and the number of voluntary associations (per capita). Regarding outcomes, they looked at three types of crimes: thefts, robberies and car thefts. Estimating a spatial lag model, the authors documented a negative and significant effect of both blood donations and the number of associations on all three types of crimes, but found no effect of referendum turnout. The authors interpreted these findings as evidence that social cohesion and civic mindedness can affect the incidence of dishonest behaviour in a community, and that interventions aimed at fostering these community characteristics can contribute to reducing crime.

We exploit BMV's analysis to study how our dimensions correlate with a set of crime variables. For simplicity, we focus only on the OLS estimates and collapse their three main outcomes into a single crime index by taking the average. In [Online Appendix Table A12](#), we also report the results for each outcome separately. We include the same set of socio-economic, demographic and geographic controls originally used by the authors, which are listed in the note to the table.<sup>34</sup> [Table 7](#) reports the results of our exercise. For exposition clarity, we focus on three of the four measures of social capital used by BMV—blood donations, turnout in referenda and the number of non-profit associations—and disregard the number of voluntary associations, which is a subset of the latter.<sup>35</sup>

In columns (1)–(3), we replicate BMV's original analysis and regress crime rates on each of the three measures of social capital they used. As in BMV, both blood donations and the number of associations display a strong negative relationship with crime, while this is not the case for turnout in referenda. In columns (4) through (7) we estimate the effect of our four survey-based measures, including them in the regression one at a time. The coefficients for social participation, political participation and general trust are all negative and significant, while the coefficient for institutional trust is positive, but not significant. The magnitude of the coefficient on social participation is especially sizeable.

<sup>32</sup> Another possibility is that the survey-based measures of social capital are more vulnerable to measurement error than behavioural outcomes such as donations and turnout. This argument, however, should also apply to general trust, which always displays a significant effect.

<sup>33</sup> For completeness, in [Online Appendix Table A11](#), we report the results separately for each of the five measures of financial development originally used by GSZ, which confirm the findings in [Table 6](#). In [Online Appendix Table A11](#) all the social capital measures are standardised, and hence the differences in the coefficients of turnout in referenda and blood donations with respect to those in the tables of the original paper.

<sup>34</sup> In their analysis, the authors used a set of spatial lag models. Since the interpretation of the estimates is less straightforward, for simplicity and for the sake of our exercise, we present our analysis using simple OLS. Importantly, the results are unchanged when using their spatial lag estimator. Also, in their paper, BMV also estimated a 2SLS model instrumenting voluntary associations with historical variables. As above, for conciseness, and for lack of the required data, we ignore the 2SLS analysis and only discuss the OLS results.

<sup>35</sup> Importantly, results do not change when including voluntary associations instead of the number of non-profit associations or both simultaneously. The correlation between these two measures is 99%.

Table 7. *Social Capital and Crime (BMV replication)*.

	Dependent variable: <i>Crime Index</i>									
	BMV social capital measures			ADL survey social capital measures				All measures		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Non-profit association (BMV)	-0.151**							-0.142**		-0.027
	(0.064)							(0.064)		(0.065)
Blood donation (BMV)		-0.149***						-0.148**		-0.136***
		(0.055)						(0.057)		(0.052)
Turnout referenda (BMV)			0.015					0.137		0.010
			(0.107)					(0.106)		(0.105)
Social participation				-0.307***					-0.241***	-0.229***
				(0.064)					(0.086)	(0.084)
Political participation					-0.162***				-0.104**	-0.088*
					(0.042)				(0.047)	(0.047)
General trust						-0.137*			-0.009	-0.035
						(0.072)			(0.084)	(0.087)
Institutional trust							0.018		0.080*	0.076
							(0.049)		(0.047)	(0.046)
Observations	103	103	103	103	103	103	103	103	103	103

Notes: The table reports OLS estimates of the *Crime Index* on various measures of social capital. *Crime Index* is the (standardised) simple average among the three outcome variables used in BMV: the number of common thefts, robberies and car thefts. The three variables are measured between 2000 and 2002 at the provincial level and reported per 1,000 inhabitants in logs. *Associations*, *Blood donation* and *Turnout referenda* are the social capital measures used by BMV. In particular, *Associations* are the number of cultural, recreational, artistic, sports, environmental and other non-profit associations per 100,000 inhabitants in 2000; *Blood donation* is the number of blood donations per 100,000 inhabitants collected in 2000; *Turnout referenda* is the voter turnout for all referenda held 1974–99. *Social participation*, *Political participation*, *General trust* and *Institutional trust* are our usual measures of social capital components obtained from the ADL survey, as described in Section 3.1 All social capital measures are standardised to facilitate the comparison of estimated coefficients. Following the original paper, all regressions include the same set of socio-economic, demographic and geographic controls: the length of the entire judicial process; the (crime-specific) clear-up rate (lagged one period); the percentage of men aged 15–29; the share of the population living in cities with more than 100,000 inhabitants; GDP per capita, unemployment rate and share of the population with a high school education; the number of charges for criminal association per 100,000 inhabitants; macro-region FEs, i.e., dummy variables for the south, centre and north of Italy. Robust SEs are reported in parentheses. \*  $p < .1$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .

In the last three columns, we perform a horse race with different measures of social capital. In column (8), we compare the three variables used by BMV and find that the results largely confirm those of the univariate regressions. Column (9) shows that, when the four survey-based measures are included in the regressions together, political participation and especially social participation display a significant effect, while the coefficient on general trust becomes very small and insignificant. Finally, in column (10) we include all measures simultaneously. In this case, we find negative and highly significant effects for blood donations, social participation and political participation. The coefficient on social participation is the largest and implies that a one-SD increase in participation is associated with a 0.2-SD decline in the crime index.

Interestingly, when the survey-based variables are included, the coefficient on the number of associations drops nearly to zero and becomes insignificant. This suggests that a measure capturing active participation in voluntary associations is an accurate proxy for the presence of an active collective life, which is key for crime deterrence. The relatively stable and large coefficient on political participation indicates that local political activism also affects the quality of law enforcement, possibly through increased accountability of local officials. Finally, as was the case for financial development, the robust effect of blood donations indicates that this variable captures some other unknown dimension of social capital that affects crime not through social and political participation nor through trust.

As shown in Online Appendix Table A12, we obtain consistent results using as the dependent variable the individual measures of crime used by BMV separately. Again, social participation and blood donations show the strongest relationship with crime rates.

## 6. Social Capital and Other Outcomes

In this section we provide further empirical support for the argument that different dimensions of social capital matter for different types of outcomes.

More specifically, we investigate the relationship between our measures of social capital and a series of other outcomes related to (i) health, (ii) economic development, (iii) political accountability and (iv) tax compliance. We focus on these domains for several reasons. First, these are outcomes that have been extensively studied by previous studies on the impact of social capital. Second, for each of these outcomes, data are available for Italy at the province level. Third, based on previous work and on our intuition, we expect the relationship with these outcomes to vary for different dimensions of social capital. For example, one would expect political participation to be especially related to political accountability, while trust in others may arguably matter more for economic outcomes.

For each outcome, we estimate the regression

$$y_p = \beta \text{Social Capital Component}_p + \gamma X'_p + \delta_r + \epsilon_p, \quad (1)$$

where  $y_p$  is the dependent variable defined at the provincial level, *Social Capital Component*<sub>*p*</sub> indicates one of our four survey-based dimensions of social capital and  $X'_p$  is a vector of time-invariant provincial controls that includes area, population, altitude and the presence of airports (a proxy for geographic connectedness). Because we include in all regressions region fixed effects ( $\delta_r$ ), the estimates below only exploit variation within region between provinces, something to take into account when interpreting our results. All variables are standardised to facilitate the interpretation of the results.

We first look at the relationship between social capital and health outcomes, namely, the average BMI and the share of smokers.<sup>36</sup> Figure 8 summarises the results. The left panels report the coefficients (and respective confidence intervals) from regressions in which the social capital measures are included one at a time, while the right panels are from regressions in which they are included simultaneously. Different measures of social capital relate very differently to both BMI and smoking. In particular, social participation and general trust tend to correlate negatively with both outcomes, while the pattern for political participation and institutional trust is much less clear. The result on social participation is in line with previous evidence, namely, by Mackenbach *et al.* (2017), who found that ‘high levels of neighbourhood social networks were associated with lower BMI’ (p.218). The result on smoking is instead consistent with evidence from Giordano and Lindström (2011).

Next, we explore how social capital relates to two economic outcomes: per capita value added and female labour market participation.<sup>37</sup> The results are reported in Figure 9. We find that social participation, political participation and (to a lower extent) general trust are associated with higher value added and female labour market participation (left panel). However, when the

<sup>36</sup> Studies on the relationship between social capital and obesity include Wilkinson (2005), Holtgrave and Crosby (2006), Christian *et al.* (2011), Glonti *et al.* (2016), Mackenbach *et al.* (2016), Tsuboya *et al.* (2016), Carrillo-Alvarez *et al.* (2019), Child *et al.* (2020) and Cuevas *et al.* (2020). Studies on social capital and smoking include Siahpush *et al.* (2006), Chuang and Chuang (2008) and Giordano and Lindström (2011). Finally, some studies have examined the link between social capital and other health outcomes, including Kawachi *et al.* (1997; 1999), Kawachi and Berkman (2000) and Subramanian *et al.* (2002).

<sup>37</sup> Previous studies on the link between social capital and economic outcomes include Helliwell (1996), Knack and Keefer (1997), Grootaert (1999), Narayan and Pritchett (1999), Whiteley (2000), Grootaert and Narayan (2004), Beugelsdijk and van Schaik (2005) and Westlund and Adam (2010). For a survey of cross-country evidence, see Knack (2002b).

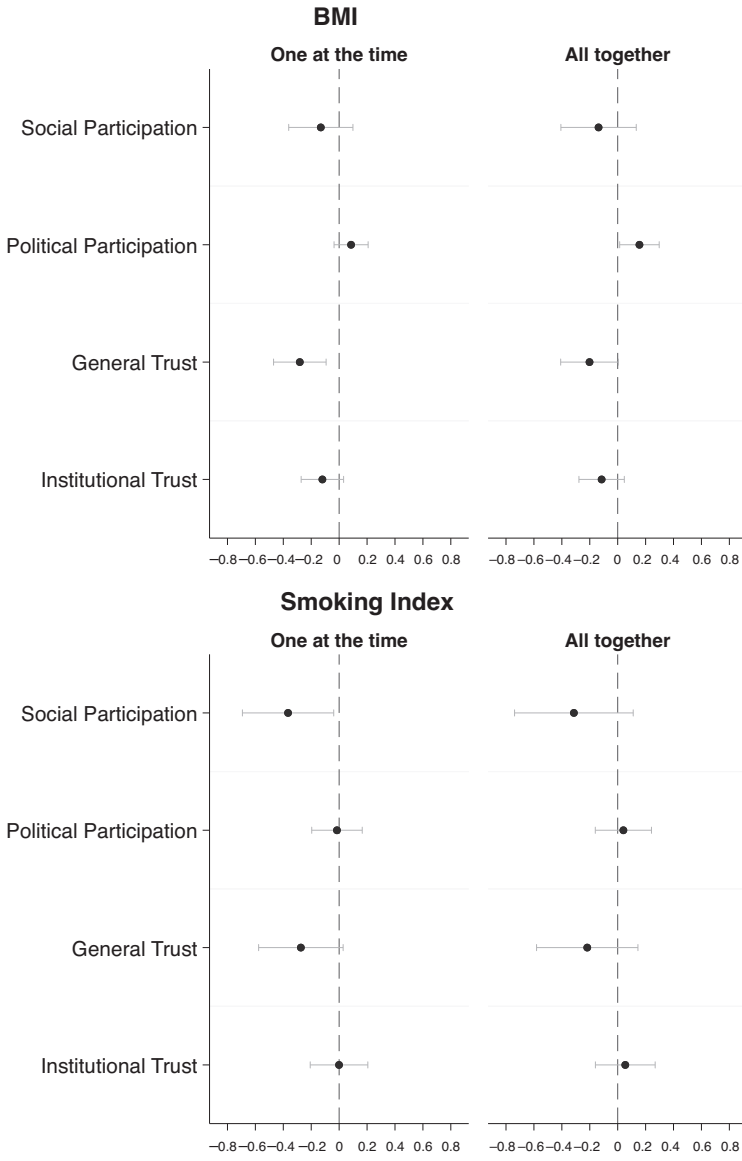


Fig. 8. *Social Capital and Health Outcomes.*

Notes: The figure reports the estimated coefficient of (1). The outcomes are BMI and Smoking in the last twelve months. The BMI is computed as the ration of weight and the square of the height. Smoking in the last twelve months is a dummy variable equal to 1 if a respondent declares to have smoked in the last twelve months. Both variables are standardised. We regress these indicators on our social capital components in both univariate and multivariate regressions. The sample is composed of 105 Italian provinces. Each regression includes region fixed effects and a set of time-invariant controls at the provincial level. These include population, altitude, the presence of airports and surface area in km<sup>2</sup>.

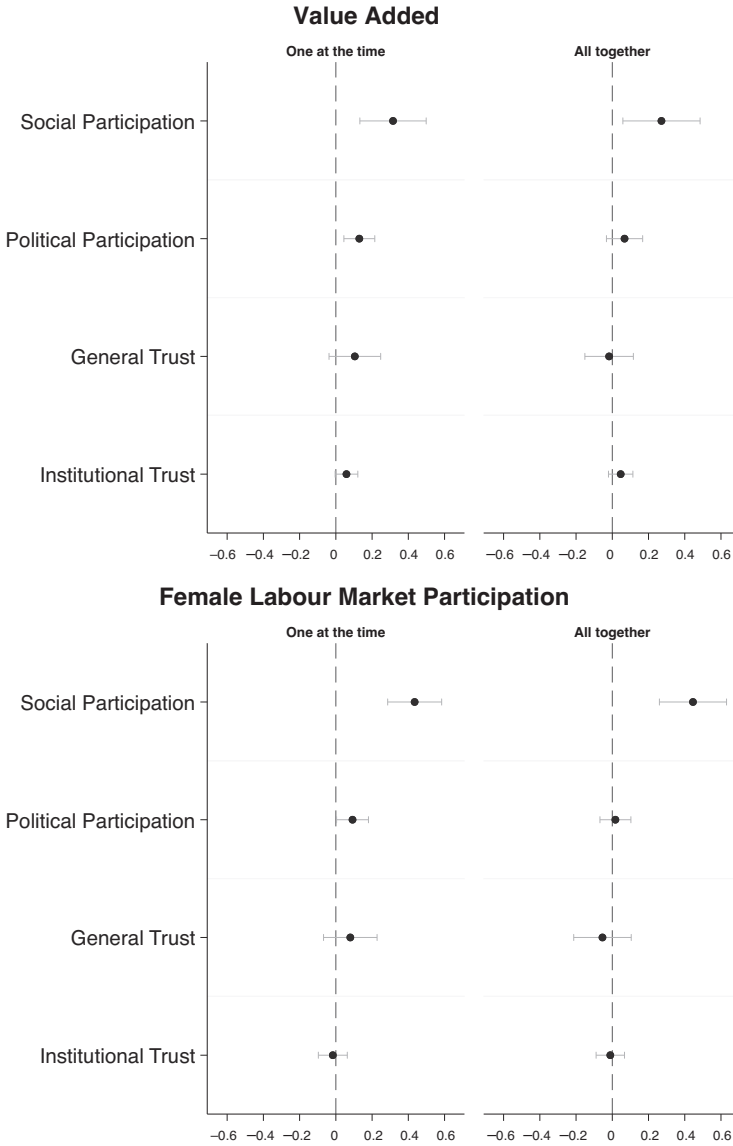


Fig. 9. Social Capital and Economic Outcomes.

Notes: The figure reports the estimated coefficient of (1). The outcomes are Value Added and Female Labour Market Participation. Both variables are standardised. We regress these indicators on our social capital components in both univariate and multivariate regressions. The sample is composed of 105 Italian provinces. Each regression includes region fixed effects and a set of time invariant controls at the provincial level. These include population, altitude, the presence of airports and surface area in km<sup>2</sup>.

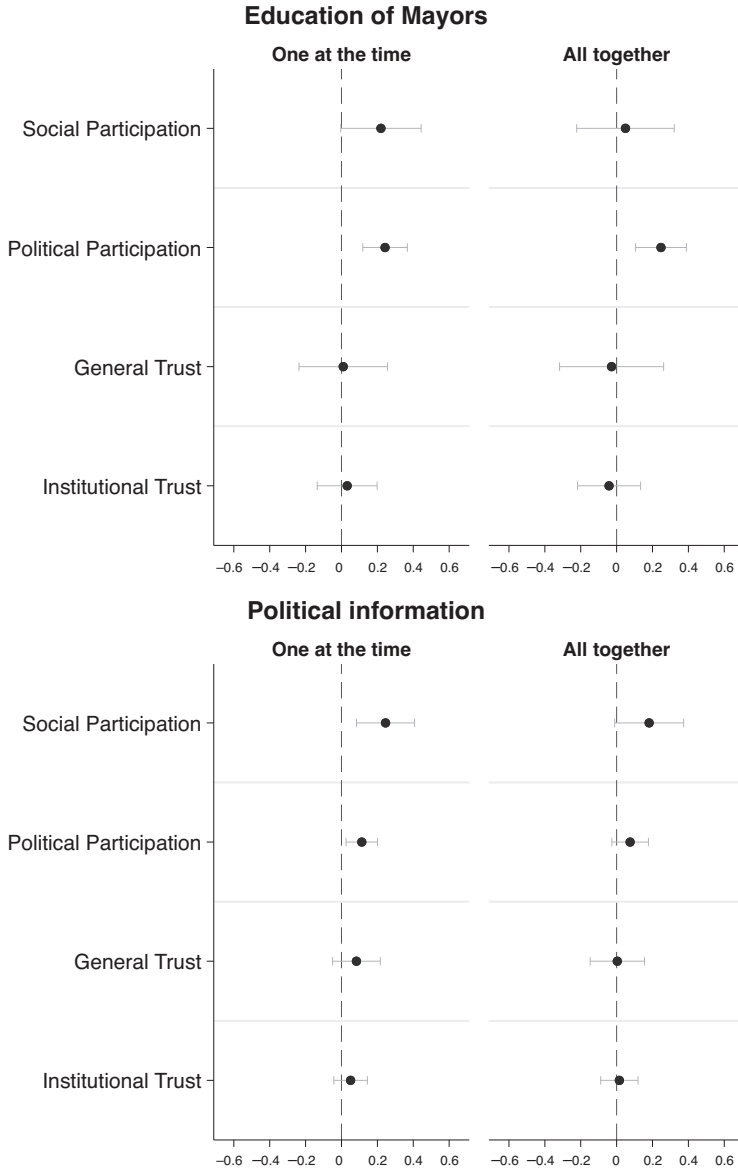


Fig. 10. *Social Capital and Political Outcomes.*

Notes: The figure reports the estimated coefficient of (1). *Education of Mayors* is a dummy variable equal to one if the mayor has a university degree. *Political Information* is constructed thanks to a question in the ADL survey ('With which frequency do you get informed about politics?') and represents the share of people declaring to follow politics in each of our provinces. Both variables are standardised. We regress these indicators on our social capital components in both univariate and multivariate regressions. The sample is composed of 105 Italian provinces. Each regression includes region fixed effects and a set of time invariant controls at the provincial level. These include population, altitude, the presence of airports and surface area in km<sup>2</sup>.

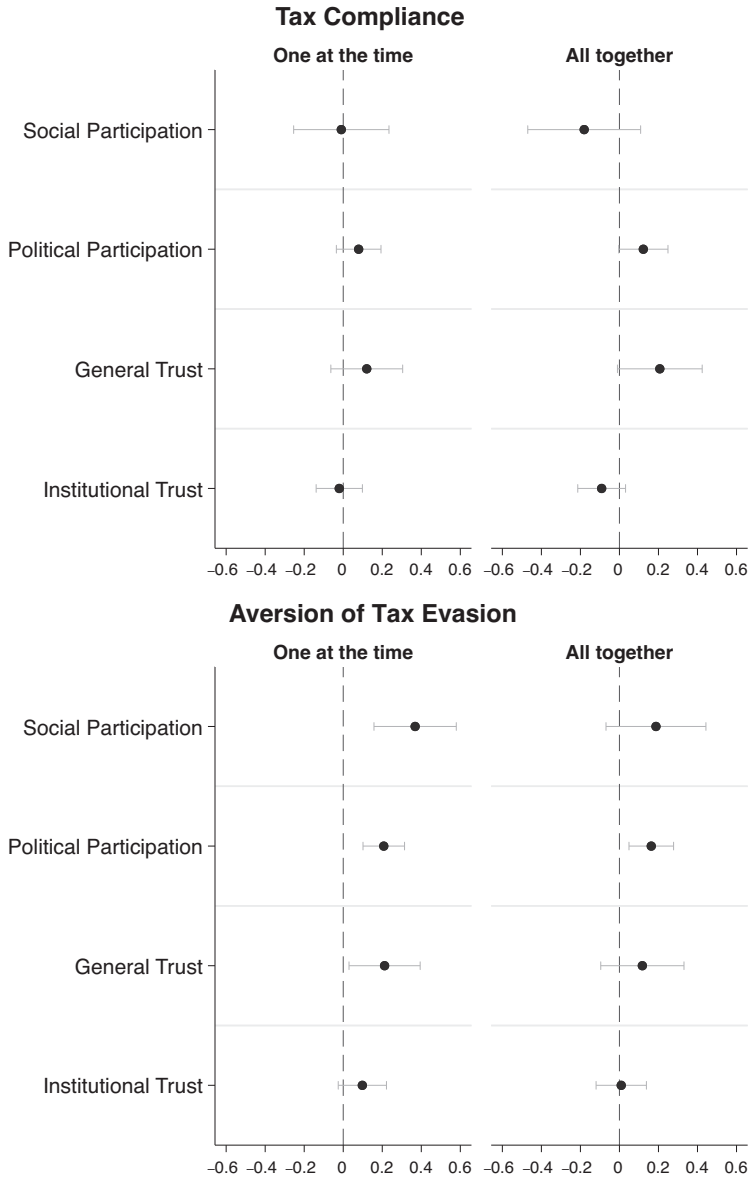


Fig. 11. *Social Capital and Tax Compliance.*

Notes: The figure reports the estimated coefficient of (1). *Tax Compliance* is the share of the household in a given province that paid the TV license fee. Perceptions of tax evasion is constructed with the ADL survey and represents the provincial share of people who report that tax evasion is the most important problem facing the country. Both variables are standardised. We regress these indicators on our social capital components in both univariate and multivariate regressions. The sample is composed of 105 Italian provinces. Each regression includes region fixed effects and a set of time invariant controls at the provincial level. These include population, altitude, the presence of airports and surface area in km<sup>2</sup>.

social capital measures are included at once (right panel), only the social participation coefficient remains significant. These findings relate to previous rather mixed evidence on the link between social participation and economic performance, including work by and Knack and Keefer (1997) and Beugelsdijk and van Schaik (2005).

Next, we examine how social capital relates to two political outcomes such as the educational attainment of local elected officials, and the level of political information of local voters.<sup>38</sup> The results, presented in Figure 10, show that political participation is associated with better selection of politicians and a more informed electorate. Instead, for both outcomes, the coefficients on general trust are basically zero. Social participation shows no relationship with mayors' education and a positive association with political information, which, however, is not significant at standard levels in the multivariate regressions. These findings relate to previous work on the link between social capital, political accountability and government performance (Knack, 2002a; Coffé and Geys, 2005). Most notably for the case of Italy, Nannicini *et al.* (2013) found that MPs elected in areas with higher social capital—proxied by blood donations—tend to be more accountable to their local constituency. Our results confirm and qualify these findings by emphasising the role of local political activism in improving information and the selection of politicians. In this regard, our results dovetail nicely with those of Knack (2002a), who documented a significant relationship between government performance and membership in 'good government' organisations (e.g., League of Women Voters).

Finally, we examine how social capital relates to tax compliance, both actual and perceived, using information on the payment of the public television fee, and on the share of survey respondents who consider tax evasion as the country's most important problem.<sup>39</sup> The results, shown in Figure 11, indicate that political participation is the most important driver of tax compliance and aversion to tax evasion. General trust may also play a role, though less significant, while the results for social participation and institutional trust are mixed. To assess the external validity of our results, we also replicate the analysis for the same sample of countries for which we have replicated the principal component analysis in Section 2.3. Overall, the cross-country results reported in Online Appendix Table A13 point in the same direction as those reported for Italy (see Online Appendix Table A13).<sup>40</sup> The results of this last section suggest that different dimensions of social capital matter for different spheres of individual and societal welfare.

## 7. Conclusion

Social capital is one of the most widely studied concepts in the social sciences. Yet, several questions remain open regarding what it captures and, crucially, how it should be measured. This paper has explored some of these questions using new survey data from Italy covering

<sup>38</sup> For previous studies of the link between social capital and political outcomes, see, e.g., Rice and Sumberg (1997), Cusack (1999), Rice (2001), Knack (2002a), Coffé and Geys (2005), Bjørnskov (2006), Claibourn and Martin (2007), Jottier and Heyndels (2010), Chamlee-Wright and Storr (2011), Nannicini *et al.* (2013) and Giuliano and Wacziarg (2020).

<sup>39</sup> Previous studies on social capital and tax compliance include Slemrod (1998), Alm and Gomez (2008), Arezzo (2014) and Bilgin (2014). In addition, there are many studies of social capital and corruption, e.g., Rothstein and Uslaner (2005), Widmalm (2008) and Banerjee (2016).

<sup>40</sup> For each country, we collected data on socio-economic outcomes as similar as possible to those used above. Overall, the cross-country results point in the same direction as those uncovered for Italy. Nonetheless, the alignment is not perfect. This is not surprising, given how diverse the set of countries in the WVS sample are, and considering that the link between social capital and the various outcomes is likely mediated by a range of country characteristics, both political, cultural and demographic.

almost 600,000 individuals over fifteen years. The large sample size, the wealth of questions on social attitudes and behaviour, and the availability of precise geographic information allow us to uncover several important patterns.

We first identify four components of social capital (i.e., political participation, social participation, trust in others and trust in institutions) that we show are distinct from each other in their geographic distribution and relationship with socio-economic characteristics. Furthermore, this relationship varies quite considerably between the individual and community levels. The four components also correlate very differently with alternative proxies of social capital commonly used in empirical work. These findings support the view that social capital is inherently multi-faceted and should be treated as such both conceptually and empirically.

We then examine the link between social capital and various outcomes previously studied in the literature. In this regard, each outcome is significantly related to certain dimensions of social capital, but not to others in ways very consistent with conceptual predictions. For example, of the four survey-based measures of social capital, only trust in others is significantly related to financial development. In contrast, only political and especially social participation are associated with lower crime incidence. Similarly, we observe that health outcomes are mostly related to general trust, economic outcomes to social participation and political outcomes to social and political participation.

Our results confirm that social capital is inherently multi-faceted and should be treated as such both conceptually and empirically. Several practical suggestions stem from these findings. First, when having to rely on aggregate proxies of social capital, researchers should ideally collect multiple alternative measures and carefully assess which one is more relevant for the outcome of interest. This evaluation should be guided, as much as possible, by a clear and coherent conceptual framework and by previous empirical evidence. In this regard, our study provides a detailed picture of how each of the commonly used proxies of social capital relates to the various components of social capital our analysis identifies (e.g., Figure 7). This information may be used to gauge what dimension of social capital (if any) each proxy is more likely to describe. Second, our findings underscore the importance, whenever possible, to validate aggregate proxies using individual survey data. Although in some cases survey data at the same geographical level (e.g., province or county) may not be available or representative of the population, exploring this relationship at a higher level of aggregation (e.g., region or state) would still be very informative. Finally, our results caution against the use of generic proxies whose conceptual link with the outcome of interest is unclear or too vague (e.g., blood donations), which should be discouraged or, at least, properly motivated. In conclusion, while our evidence supports the view that social capital is a multi-dimensional ‘umbrella concept’, this by no means makes the concept useless. One reason is that social capital appears to be especially useful when thinking about long-run, macro-level changes. Indeed, to the extent that different dimensions of social capital influence each other, it can still be helpful to model them as a single ‘bundle’ that evolves over time and has broader implications for society and the economy. If the goal is, instead, to design policies to influence specific socio-economic outcomes then it is crucial to disentangle one dimension from the other and identify which one may be the most relevant.

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Additional Supporting Information may be found in the online version of this article:

## Online Appendix Replication Package

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