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Economic growth and social capital: happily together ever after?

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Abstract

Does economic growth go with an increase of social capital over time? A long lasting debate in the economic discipline agrees that higher stocks of social capital enhance economic growth, but overlooked the temporal dimension. Indeed there are reasons to suspect that the positive correlation identified in the literature can not be extended to the relationship over time. Using three proxies of social capital (group membership, trust in others and an index of civicness) and data from the six waves integrated World Values Survey / European Value Study data-base I provide evidence confirming that at any point in time, richer countries are also richer in social capital. However, if we compare the time trends of social capital with economic growth, a negative and significant relationship arises. In other words, social capital and GDP go together across countries, but turn to be negatively correlated over time. This paradoxical evidence is compatible with an explanation in terms of increasing economic inequality: in countries experiencing strong increases in inequality, trends of social capital are negatively correlated with economic growth. For countries where economic growth is accompanied by negative or modest increases in inequality, this relationship disappears.

Keywords: economic growth; social capital; time-series; WVS; EVS.

JEL classification codes: D03; D60; I31; O10

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1 Introduction

There seems to be no doubts that money and social capital are positively correlated both within and across countries. Following the popular wisdom, the way of saying “no money, no honey” suggests that money is necessary to enjoy life including fully sharing and participating in social relationships and networks. Scandinavian countries represent one of the clearest case of economic prosperity accompanied by flourishing social capital. Accordingly, a large share of the economic literature agrees on ascribing an important role to social capital in enhancing economic growth. Basically, recent economic research pointed to social capital as a catalyst of economic interactions. Many works refer to Arrow’s words describing trust as one of the elements of every commercial transaction and ascribing some of the backwardness in the world - at least in part - to the lack of confidence in other people (Arrow, 1972). Last but not least, many empirical works found evidence of a positive cross-sectional correlation between proxies of social capital and economic growth (La Porta et al., 1999, Whiteley, 2000, Zak and Knack, 2001, Beugelsdijk et al., 2004, della Giusta, 2010).

For example, Knack and Keefer (1997) - one of the most cited works in this field - find that economic performance and social capital, as proxied by trust and civic cooperation, are strongly and positively associated.

Similarly, Helliwell and Putnam (1995) investigating Italian regions find a positive association between levels of “civic community” and GDP growth rates between 1950 and 1990 after controlling for the initial income level. Similarly, Narayan and Pritchett (1997) find evidence that higher levels of social capital, as proxied by group membership, are correlated with higher incomes.

There are many reasons to argue that social capital supports economic growth. Social capital lowers the possibilities for opportunistic behaviours and makes economic transactions safer and cheaper. This - in turn - makes people free to devote their energies to develop new techniques and investing in productive activities rather than protecting themselves from opportunistic behaviours. Hence, it is commonly held that more social capital, in the form of more trust, frees economic resources and enhances business. By the same token, higher social capital reduces the need for formal institutions to enforce agreements reducing “principal-agent” problems. Similarly, reliability of public officers is a good condition to attract greater

investments and further economic activity (Knack and Keefer, 1997). Social capital, in the form of social norms, favors the provision and maintenance of public goods solving collective action problems thanks to social stigma and ostracism. Finally, social capital can enhance economic activity also through some indirect channels. For example, “civic norms help voters overcome the collective action problem in monitoring officials” (Knack and Keefer, 1997, p. 1254).

All-in-all, there seems to be a general agreement that social capital and economic growth are correlated. However, some authors argue that economic growth can have detrimental effects on social capital (see Polanyi (1968), Hirsch (1976), Olson (1982) and more recently Bartolini and Bonatti (2008)).

In his interesting work Roth (2009) claimed that a vibrant society - rich in associational activity and trust - can efficiently drive collective action against policies for economic growth. For example, labor market reforms liable to enhance economic activity can be impaired by an efficient social action resting upon social capital. In a pioneering study on 17 developed countries, Helliwell (1996) provides evidence of a negative relationship between trust in others and productivity growth from 1960 to 1992. Moreover, Putnam (2000) provides convincing evidence that over the last 30 years US - one of the richest countries in the world - experienced an erosion of social capital while growing more prosperous (Costa and Kahn, 2003, Bartolini et al., forthcoming, Sarracino, 2011).

Some recent studies also document that: i. social capital is not crystallized and it can vary over time even in a relatively short term (Sarracino, 2011); ii. economic growth can be the outcome of social erosion Bartolini and Bonatti (2002a, 2008).

Hence, there are reasons to carefully reconsider the relationship between social capital and economic growth investigating their correlation over time. Indeed, previous empirical literature suffers an important limitation: it is based on correlations between stocks of social capital and economic growth, while neglecting the relationship with the variations of social capital over time. In other words, existing research misses the time trends dimension of the problem.

Is economic growth correlated to an increase in social capital over time? Only a very recent article by Roth (2009) deals with this issue. Using data on social capital from the first three waves of the World Values Survey, the third European Value Study wave and the Eurobarom-

eter 25 for 1986, Roth (2009) documents that the changes of trust over time are negatively correlated with economic growth during the '90s. However, Roth's work is constrained by the availability of a relatively short time-series (1980 - 2002) and considers only one proxy of social capital, namely trust in others.

The aim of present work is to further explore the relationship between social capital and economic growth over time trying to overcome some of the limitations of previous works. In particular, recent developments of some of the major cross-national and longitudinal surveys make it possible to reconsider available evidence in two respects: 1. testing the relationship between social capital and economic growth using a larger number of proxies of social capital, namely trust in others, civic attitudes and group membership; 2. adopting a time-series perspective using data from the six waves World Values Survey/European Values Study (WVS/EVS) integrated data-set covering the period from 1980 to 2009.

My analysis confirms previously observed positive correlation between the stock of social capital and GDP across countries: at any point in time, richer countries are also richer in social capital. However, if we adopt a time-series perspective comparing the time trends of social capital with economic growth, a negative and significant relationship arises.

Several hypothesis can be proposed to explain this puzzling evidence. A convincing one suggests that economic growth can set at various paces and with different impacts on the social fabric of a country. Therefore, if economic growth is accompanied by an increase in inequality, we might suspect that social linkages and feelings of solidarity and cooperation can get weaker resulting in an erosion of social capital. In present work I provide some evidence that when economic growth goes with a rise in economic inequality - as measured by the Gini index - it is accompanied by an erosion of social capital.

2 Data

The main focus of this work is on the correlation between the variations of SC and GDP growth over time. Therefore, the availability of comparable time-series across countries is the main limiting aspect of present analysis.

I adopt the 6 waves integrated World Values Survey¹ (WVS) - European Values Study² (EVS) data-set which is currently the most comprehensive data-base providing cross-nationally comparable data concerning many domains of people's social life and values over a long time span³. The surveys have been conducted on nationally representative samples of 800 to 4000 people per wave in more than 80 countries, summing up to a total of more than 400000 observations from the early '80s to the year 2009. Data have been collected in 1981 - 1984, 1989 - 1993, 1994 - 1998, 1999 - 2004, 2005 - 2007 and 2008 - 2009.

The sample available for present study is smaller since I focus on all those countries with repeated observations over a period of at least 10 years for each proxy of social capital. I consider such a time span because according to OECD (2001a) it takes time and effort to build and maintain social capital. Moreover, it can take some time before social capital can interact - directly or indirectly - with economic growth.

Furthermore, I exclude transition economies (Roth, 2009). This choice is motivated by the fact that during the first years of the transition to capitalism the social, economic and institutional shock could have affected social capital in unpredictable ways well beyond its relationship with GDP. At the same time, excluding only the observations collected close to the shock of 1989 would result in no transition country satisfying the 10 years time-span requirement. However, in section 4 I also provide some evidence to further justify the exclusion of transition economies. After replicating previous evidence on the cross-section relationship between social capital and GDP across developed and developing countries and transition economies (see page 12), figures support the choice of excluding the latter group of countries from the sample used for the time series analysis.

Overall, present sample includes 33 countries with a total of 186576 observations (see table 1 for an overview of the considered countries, the sample sizes and the availability of data).

The limitations imposed by the length of the time-span will be removed as a sensitivity check in section 4. First, I will consider only those countries with longer time series (at least 15 years). In this case, the sample is restricted to 30 countries. Subsequently, I will turn to all those countries for which at least two years of observations are available. In other words I am

¹<http://www.worldvaluessurvey.org>

²<http://www.europeanvaluesstudy.eu>

³WVS and EVS are freely available on line as well as instructions on how to integrate the two data-sets. For more details, please refer to: <http://www.wvsevsdb.com/wvs/WVSDData.jsp>.

Table 1: Availability of data across waves

	1981-1984	1989-1993	1994-1998	1999-2004	2005-2007	2008-2009	Total
Argentina	912	961	1053	1248	983	0	5157
Australia	1189	0	2025	0	1386	0	4600
Austria	0	1301	0	1415	0	1452	4168
Belgium	1001	2576	0	1824	0	1495	6896
Brazil	0	1766	1141	0	1477	0	4384
Canada	1217	1673	0	1910	2107	0	6907
Chile	0	1458	977	1169	984	0	4588
China	0	985	1445	963	1867	0	5260
Denmark	1059	992	0	986	0	1478	4515
Finland	983	558	969	1015	1000	1073	5598
France	1117	939	0	1560	996	1487	6099
Germany	0	2893	1951	1937	1896	1940	10617
Iceland	909	672	0	925	0	780	3286
India	0	0	1769	1898	1778	0	5445
Ireland	1170	988	0	992	0	635	3785
Italy	1302	1932	0	1946	951	1456	7587
Japan	1099	911	985	1254	1020	0	5269
South Korea	918	1229	1247	1200	1181	0	5775
Malta	438	374	0	988	0	1425	3225
Mexico	1772	1384	2231	1497	1547	0	8431
Netherlands	1072	965	0	997	996	1523	5553
Nigeria	0	0	1851	0	0	0	1851
Norway	958	1156	1118	0	1018	1072	5322
Peru	0	0	1176	1490	1480	0	4146
Portugal	0	1149	0	975	0	1505	3629
South Africa	1433	0	2845	2956	2967	0	10201
Spain	2157	3887	1167	2295	1183	1468	12157
Sweden	876	944	957	974	963	1068	5782
Switzerland	0	863	1129	0	1186	1216	4394
Turkey	0	0	1878	1199	1339	1651	6067
Great Britain	1127	1440	0	960	1022	1516	6065
United States	2259	1782	1510	1188	1239	0	7978
Uruguay	0	0	975	0	864	0	1839
Total	24968	35778	30399	37761	33430	24240	186576
Observations	186576						

not imposing any constraint on the length of the time span between two observations for the same country. In this case the sample includes 50 countries.

SC has been longly a much debated topic and currently it still lacks a broadly shared definition (Van Deth, 2008). Indeed, this concept has been developed and applied in many domains. Some of the fathers of this concept propose different definitions for it.

James Coleman states: “social capital is the set of resources that inhere in family relations and in community social organization and that are useful for the cognitive or social development of a child or a young person.”⁴ Pierre Bourdieu, considered among the fathers of this concept, refers to social capital as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition ... which provides each of its members with the backing of collectively-owned capital.”⁵ Putnam et al. (1993) provided one of the most modern definitions describing social capital as the “features of social life - networks, norms, and trust - that enable participants to act together more effectively to pursue shared objectives.”⁶ This definition is currently widely adopted in the literature and many works take it as a reference point. For example, OECD (2001b) considers social capital as “network together with shared norms, values and understandings that facilitate co-operation within or among groups”. Similarly, the World Bank refers to SC as norms and networks that enable collective action (Grootaert, 1998).

Notwithstanding the various distinctions, there is some agreement on the fact that social capital is characterized by three main features: networks, norms and trust (Paxton, 1999, Costa and Kahn, 2003, Van Schaik, 2002).

In present work, I observe the level of trust in a society through answers to the following question: “Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?”. The resulting dichotomous variable is set to 1 if the respondent answers positively, 0 otherwise (Knack and Keefer, 1997).

Norms of civic cooperation are observed through answers to questions concerning the justifiability of each of the following behaviors:

⁴quoted in Schuller et al. (2000, p. 6)

⁵quoted in Schuller et al. (2000, page 5)

⁶Putnam et al. (1993, p. 56)

- “claiming government benefits which you are not entitled to”;
- “avoiding a fare on public transport”;
- “cheating on taxes if you have the chance”;
- “accepting a bribe”

Answers to these questions range on a 1 (never justifiable) to 10 (always justifiable) scale. For the purposes of present work, each of these variables have been recoded so that larger values stands for stronger norms of civic cooperation. To construct the variable I run a factor analysis on the four questions to generate an index of civicness as the weighted average of the four standardized initial variables (for more details, please refer to the Appendix on page 32).

Finally, I proxy individual SC by observing the respondent’s participation in various kinds of groups and associations. Indeed, WVS/EVS include a battery of questions concerning whether people belong or actively participate in groups or associations. The list of organizations prompted during the interview is quite long and contains - among others - religious, cultural, sport, professional, environmental, human rights and political associations (for the complete list of groups or associations see the Appendix F on page 30). Group membership is measured with a dichotomous variable set to 1 if the respondent participates or performs unpaid voluntary work for at least one of the mentioned groups or associations, 0 otherwise.

Data about GDP per capita (constant 2000 US\$) are extracted from the World Development Indicators (WDI)⁷ and converted into logarithmic scale (Knack and Keefer, 1997, Whiteley, 2000).

Finally, I include the Gini index of net income inequality. Data are taken from the Standardized World Income Inequality Database⁸ (SWIID) a longitudinal cross-national data-base providing comparable Gini indices of gross and net income inequality for 171 countries (Solt, 2009).

Descriptive data and missing values for each variable are presented in table 2.

Percentages of missingness are on average below 10% and according to the literature on data missingness they don’t raise risk of serious biasing estimates (Schafer, 1997, Allison,

⁷World Development Indicators and Global Development Finance, <http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=2>.

⁸<http://www.siuc.edu/~fsolt/swiid/swiid.html>

variable	mean	sd	min	max	obs	missing
group membership	0.599	0.490	0	1	199437	0.0706
trust in others	0.342	0.474	0	1	205105	0.0442
index of civicness	0.0632	0.942	-4.900	0.768	184050	0.142
ln of GDP per capita	9.176	1.221	5.763	10.65	210462	0.0192
Gini index	35.19	10.75	20.13	65.47	186626	0.130

Table 2: Descriptive statistics and missing values for the pooled data-set of countries with at least 10 years long time-spans.

2001, Little and Rubin, 2002). However, in two cases data missingness is higher: this is the case of the index of civicness (14.2%) and for income inequality (13.0%). A comparison with table 3 - reporting the percentage of missingness wave by wave - informs that the two variables were not consistently observed over the all period. The variables composing the index of civicness were largely not collected in the fourth wave (32.0%) and - to a smaller extent - in the previous three waves. Similarly, the Gini index is largely unavailable in the fifth (30.%) and sixth (41.5%) wave. However, the source of missingness is the survey design: in some years and countries the surveys did not include some of the relevant questions for present work. Hence, data missingness constrains the period over which trends can be estimated, but it does not bias the estimates of trends since we can assume the missingness pattern to be random (Schafer and Graham, 2002, Saunders et al., 2006). Indeed, I use individual level data to compute national level estimates of the variation of each variable over time. What matters in this framework is that missing data do not bias such estimates. Section 3 describes in detail the empirical strategy that I followed.

variable	wave 1	wave 2	wave 3	wave 4	wave 5	wave 6	total
group membership	0	0.157	0.0341	0.119	0.00192	0.0467	199437
trust in others	0.0613	0.0688	0.0378	0.0291	0.0340	0.0316	205105
index of civicness	0.0576	0.0970	0.166	0.320	0.0987	0.0326	184050
ln of GDP per capita	0.0116	0.00659	0.0233	0.0220	0.0342	0.0187	210462
Gini index	0.0634	0.0303	0	0.0654	0.301	0.415	186626

Table 3: Percentage of data missingness across waves for the pooled data-set of countries with at least 10 years long time-spans.

3 Empirical strategy

My analysis consists of four steps: i) I replicate previous cross-sectional evidence on the relationship between stocks of social capital and economic growth using my set of proxies and

the average levels from the period 1980 - 2009. This step is aimed at confirming available evidence from the literature and provides support to exclude the group of transition economies from the rest of the analysis; ii) I compute the trends for each of the proxies of social capital, GDP and Gini; iii) I regress the time trends of social capital on the time trends of the logarithm of GDP per-capita to assess the correlation between the two variables; iv) to explain the negative correlation between the trends of social capital and economic growth, I replicate my regressions on a subsample of countries that experienced rising economic inequality.

3.1 Estimating trends

I compute the time trends of social capital by regressing the individual level information of each proxy over a time variable containing the years when the variable was observed. This computation is repeated for each country separately. The coefficient of the time variable represents the average yearly change of the specific proxy for a given country. In other words, I adopted individual level information to get aggregate average estimates of the variations over time for each variable. I applied a similar procedure to compute the variations of the two macro variables. The difference is that in this case I do not have individual level data, but national aggregate statistics observed in various moments in time.

The regression methodology changes depending on the nature of the dependent variable: in case of a dichotomous variable (such as participation in groups or organizations and trust in others), I adopted a probit model with robust standard errors reporting marginal effects. The resulting equation is:

$$Pr(Proxy_i^j = 1 | YEAR_i^j) = \phi(\beta^j \cdot YEAR_i^j + \mu_i^j) \quad (1)$$

where ϕ is a normal cumulative distribution function. Marginal effects of coefficients are subsequently computed.

In case of the logarithm of GDP, the index of civicness and economic inequality, I adopted a standard OLS model:

$$Proxy_i^j = \alpha + \beta^j \cdot YEAR_i^j + \mu_i^j \quad (2)$$

in both equation 1 and 2 index j stands for the various proxies of social capital, while index i

stands for individuals. Both equations are computed for each country separately.

This approach allows to compute the variations for each variable accounting for what happened between the initial and the final year of the time series. Indeed, when dealing with long term relationships there is a high risk that estimates are affected by wave-specific biases due to shocks and/or measurement errors when focusing only on the initial and final year of observation. The important advantage of this technique is that it reduces this risk by considering intermediate observations.

Time trends have been computed applying the original weights provided in WVS/EVS.

3.2 Bivariate analysis

To check the correlation among the variations of social capital and GDP over time I run a bivariate linear regression with robust standard errors using the coefficients from equation 1 and 2. In this case, the unit of analysis shifts from the individual to the aggregated, country level. Therefore, I am moving from a micro to a macro perspective. The model I adopt is:

$$\Delta SC_c = \alpha + \beta \cdot \Delta \ln GDP_c + \mu_c \quad (3)$$

where ΔSC and $\Delta \ln GDP$ represent the standardized time trends of social capital and of the logarithm of GDP as previously computed; μ is the error term and the index c refers to countries.

I am aware that the relationships I am estimating might be affected by endogeneity problems at various levels. However, the present work aims at exploring the nature of the relationship between some proxies of social capital and economic growth. Assessing the causal nexus between these two groups of variables is beyond the goal of this work. Therefore, I emphasize that regressions from equation 3 explore only the correlations between variables. Any eventual conclusion in terms of causal relationship is not justified.

4 Results

4.1 Cross-sectional relationship between GDP and SC

Is an increase in the stock of social capital positively associated with economic growth?

Figures from the pooled WVS/EVS data set are consistent with results from previous studies: at any point in time a higher GDP goes with greater social capital. In figures 1, 2 and 3 information from 54 developed, developing and transition economies are gathered together to replicate previous evidence.

The relationships among variables are showed using regression lines: the solid line summarizes the linear correlation of the whole sample, the three dotted lines show the same information for developed, developing and transition countries separately and, finally, the dashed curved line reports the quadratic fit.

Linear coefficients are all positive and significant at least at 10%. On average, one standard deviation increase in the logarithm of GDP per capita is correlated with an increase by 0.32, 0.54 and 0.35 points for group membership, trust in others and civicness, respectively (see table 12 on page 25 in the Appendix). This result is confirmed even if we consider the relationship among variables for each wave separately⁹.

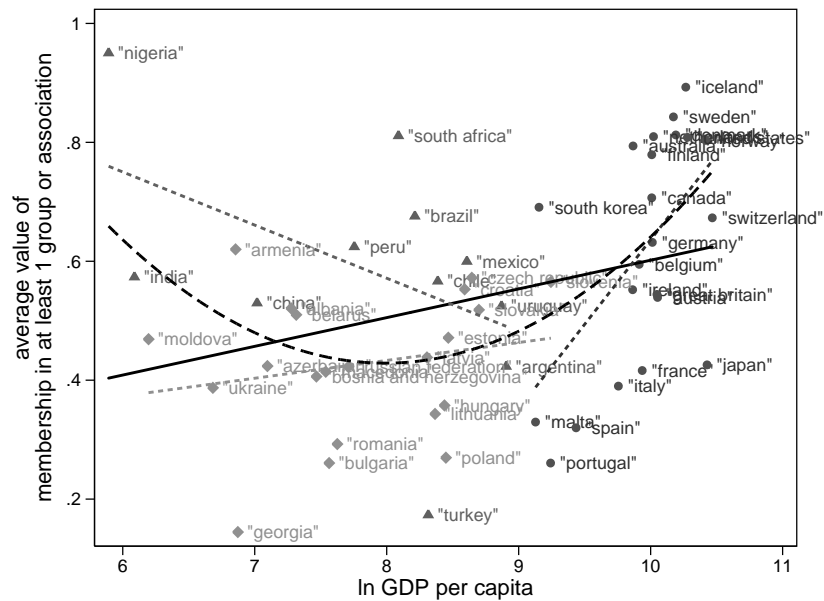


Figure 1: Correlations from the pooled data between levels of membership in groups and associations and economic growth. The light, medium and dark grey dashed lines summarize the correlations between the two variables in developing, transition and developed countries; the solid black line and the dashed black curve represent respectively the linear and curvilinear relationship on the whole sample.

However, the availability of a larger number of countries with respect to previous works

⁹Figures are available from the author upon request.

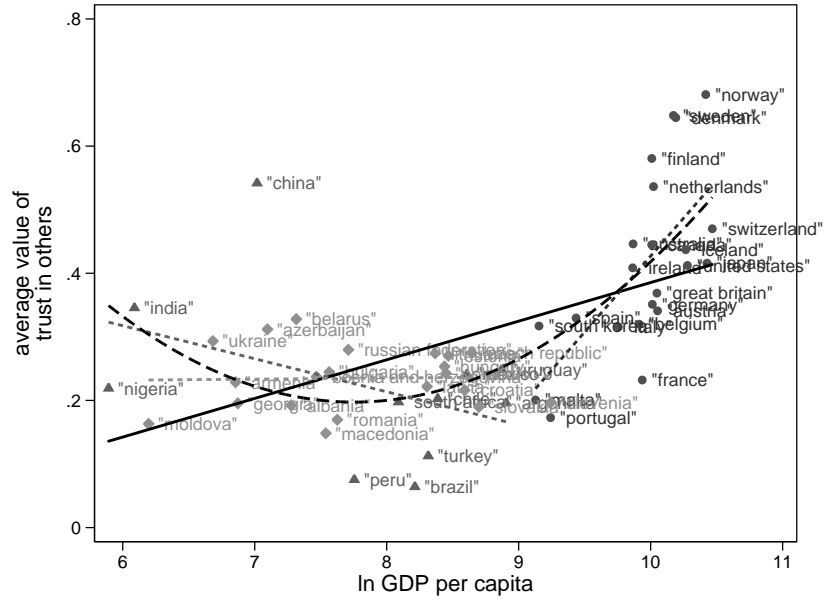


Figure 2: Correlations from the pooled data between levels of trust in others and economic growth. The light, medium and dark grey dashed lines summarize the correlations between the two variables in developing, transition and developed countries; the solid black line and the dashed black curve represent respectively the linear and curvilinear relationship on the whole sample.

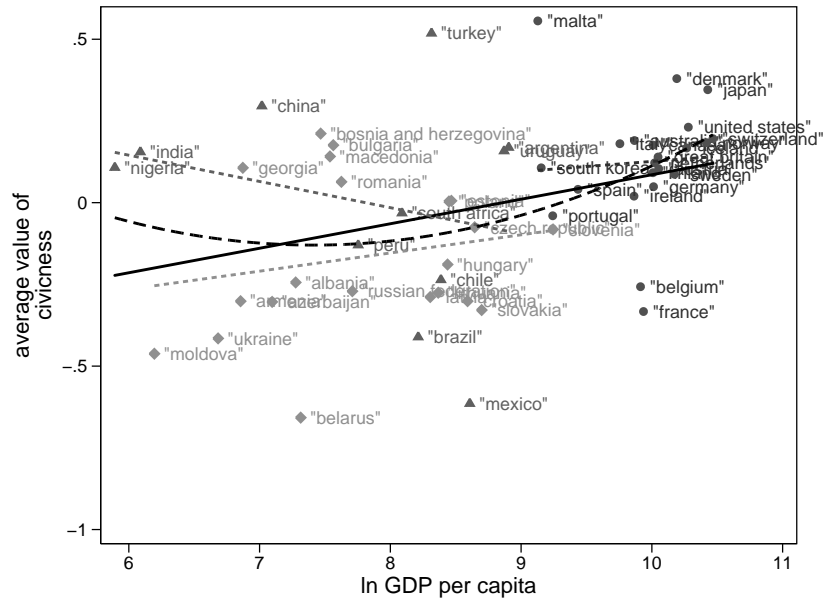


Figure 3: Correlations from the pooled data between levels of the index of civiness and economic growth. The light, medium and dark grey dashed lines summarize the correlations between the two variables in developing, transition and developed countries; the solid black line and the dashed black curve represent respectively the linear and curvilinear relationship on the whole sample.

reveals an even more interesting pattern than the one previously identified. In particular in the case of group membership and trust in others, the scatterplot reveals a stratification among countries. Developing countries are situated on the left side of the diagram and the partial correlation informs that in this case richer countries report lower endowments of social capital; on the right side of the diagram, we find more developed countries which are characterized by higher GDP and larger stocks of social capital. Finally, somewhat in between among these two groups and at the bottom of the diagram, there is a group of transition economies. In this case, and consistently with previous findings in the literature (Barro, 1991, Knack and Keefer, 1997, Zak and Knack, 2001, Beugelsdijk and van Schaik, 2005, Roth, 2009), there is a flat relationship between GDP and SC. This evidence, associated with previous findings, provides some support in favour of the hypothesis that the economic transformation affected social capital in unpredictable ways well beyond its relationship with GDP.

All-in-all, this stratification suggests that the data cloud is better approximated by a curvilinear U-shaped relationship. In other words, the availability of more data informs that for low levels of GDP, the stocks of social capital tend to reduce when GDP increases. Beyond a threshold of about 3250 US\$ per capita, the relationship turns positive: for richer countries, a higher GDP is associated with higher levels of SC.

However, this relationship does not seem to be valid in the case of the index of civicness, where a linear relationship seems to better fit the data.

Finally, transition economies are situated at the bottom of the scatterplots. Figures suggest that these countries are characterized by low levels of SC, both in terms of group membership, trust in others and, partly, civicness suggesting an overall flat relationship between GDP and SC. The exceptionalism of transition economies can be explained if seen in the light of the shock of the late '80s that altered the relationship between economic growth and social capital in unpredictable ways. A similar explanation is provided by other authors who found the same pattern (Roth, 2009).

The picture presented so far is encouraging. It confirms previous results and provide an optimistic perspective: beyond a given threshold, a higher GDP goes with a higher SC. Therefore, we could expect that, if we exclude transition economies, raising GDP is associated with increasing SC.

Unfortunately, the analysis of the correlation between economic growth and the variations

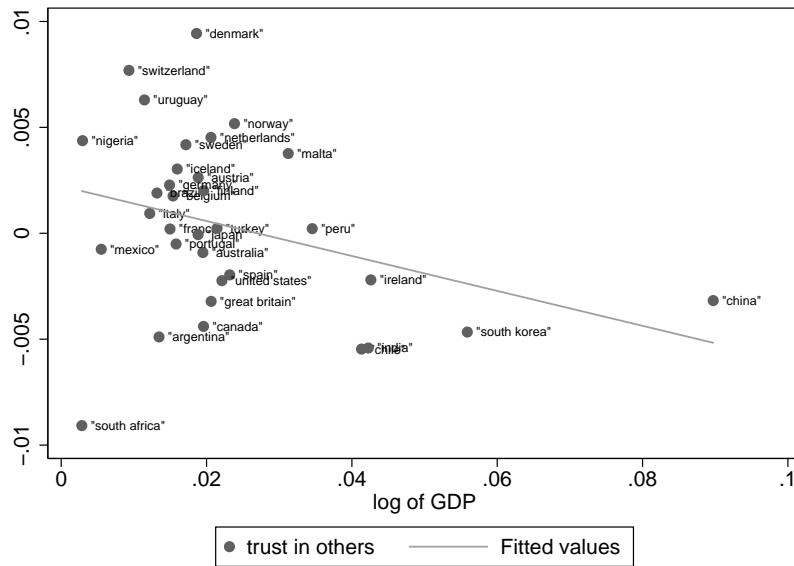


Figure 5: Correlations between time trends of trust in others and of the logarithm of GDP per capita. Each dot on the scatterplot associates the trend of trust in others - on the y axis - with the trend of the logarithm of GDP. The regression line simply depicts the correlation between the two variables.

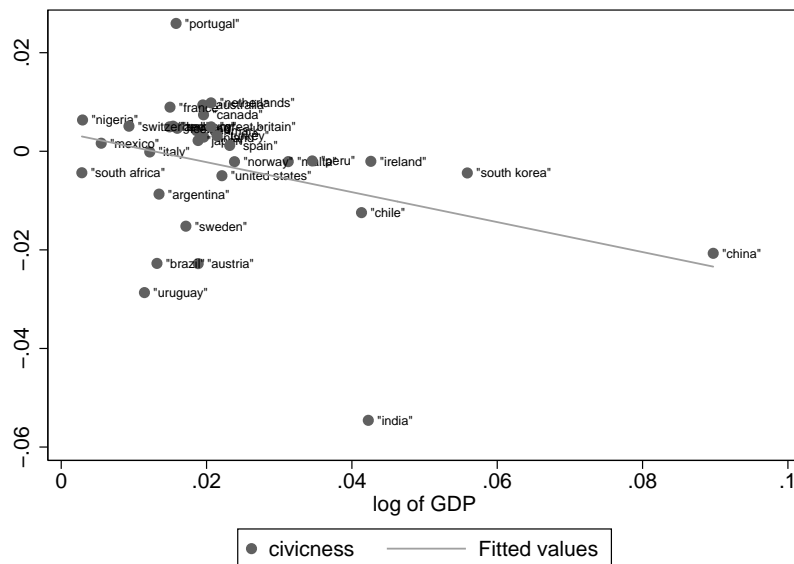


Figure 6: Correlations between time trends of the index of civciness and of the logarithm of GDP per capita. Each dot on the scatterplot associates the trend of the index of civciness - on the y axis - with the trend of the logarithm of GDP. The regression line simply depicts the correlation between the two variables.

Table 4: Correlations among long term trends of SC proxies and log of GDP per capita (standardized variables).

	(1) group membership	(2) trust in others	(3) civicness
log of GDP	−0.231* (−1.74)	−0.328** (−2.20)	−0.346** (−2.43)
Constant	0.449*** (4.34)	−0.124 (−1.17)	−0.355** (−2.60)
Observations	32	33	33

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

time series of different length?

To start with, let's consider the variations of GDP and SC without imposing any constraint on the minimum number of years. That is to say, I am focusing on all those countries that have been observed at least two times independently from the distance between the two observations. Once I excluded transition economies, I am left with 43 countries for group membership¹¹, 50 countries for trust in others and 49 for the index of civicness¹² (see table 5). The differences in the sample sizes are due to the fact that the various proxies of social capital have not always been observed in the same waves.

Figures are consistent with the evidence from long term trends. Charts in figure 8 on page 27 illustrate that in two cases out of three, the relationship between economic growth and social capital is negative and significant. In the third case, trust in others, the coefficient is still negative, but not significantly different from zero (see table 5).

Alternatively, we could argue that a time span of at least 10 years is still too short to allow the two variables to adjust. For example, variations of social capital might require a very long time to adjust to economic changes. What does happen to the relationship between economic growth and social capital if we adopt a very long time perspective?

To answer this question, let's focus on all those countries with time series of at least 15 years. Data from 30 developed and developing countries confirm that over time economic

¹¹This variable was observed only once for Indonesia (2006), Iran (2007), Jordan (2007), Nigeria (1995) and Egypt (2008), whereas it is completely missing for Iraq and Pakistan. In these cases it was not possible to compute trends.

¹²Relevant variables for Iraq were observed only once in 2004.

Table 5: Correlations among long term trends of SC proxies and log of GDP per capita for periods of at least two years (standardized variables).

	group membership	trust in others	index of civicness
log of GDP	-0.260** (-2.06)	-0.180 (-0.72)	-0.289* (-1.85)
Constant	0.202 (1.22)	-0.0502 (-0.24)	-0.270* (-1.72)
Observations	43	50	49

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

growth goes with an erosion of social capital (see figure 9 on page 29).

Coefficients are all quite large and significant at least at 10%: an increase by one standard deviation in the logarithm of GDP is associated with a decline by -0.24 standard deviation points for group membership, -0.24 for trust in others and -0.34 for the index of civicness (see table 6).

Table 6: Correlations among long term trends of SC proxies and log of GDP per capita for a time span longer than 15 years (standardized variables).

	group membership	trust in others	index of civicness
log of GDP	-0.243* (-1.91)	-0.242* (-1.86)	-0.346** (-2.60)
Constant	0.390** (2.79)	-0.0358 (-0.23)	0.0321 (0.19)
Observations	30	30	30

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

This result is consistent with the one provided by Roth (2009): considering various time-spans and a larger set of proxies of social capital figures document the existence of a negative relationship between the variations of GDP and of social capital.

Unfortunately, this evidence tells an uncomfortable story: economic growth, as we know it, goes with an erosion of social capital. Obviously, this point raises fundamental theoretical questions and challenges for policy making.

How can we explain this evidence? Is there really a trade-off between these two variables? Is the erosion of social capital the price that we have to pay for economic prosperity? I try to

answer these questions in the following section.

5 A possible interpretation

This puzzling evidence does not find any immediate explanation. Why do richer countries report higher endowments of social capital, while over time the growth process is accompanied by social capital erosion? It looks like the process of economic development were associated with some side effects inducing the erosion of social capital.

One of the possible candidates can be economic inequality. Indeed, economic development is - at least in its early phases - associated with a rise in economic inequality. In this case, the negative relationship over time between social capital and GDP could be explained by an increase in economic inequality over time (Costa and Kahn, 2003). If a society is largely unequal, we might suspect that the linkages among people are weaker. Feelings of solidarity and cooperation can be eroded because of more rivalry and competition. Therefore, we might expect that when economic growth brings about an increase in inequality we are paying a price in terms of erosion of social capital.

To test the “economic inequality” hypothesis, I run a restricted version of the baseline model of equation 3 in which I focus on all those countries where the average index of inequality increases more than the average.

Figure 7 compares the average increase of inequality across the countries included in present sample. Overall, there are 13 developed and developing countries reporting a level of inequality higher than the median one. Table 7 reports the results of the correlations between the variations of social capital proxies and economic growth for the group of more unequal countries.

In all three cases the correlations are negative and significant at 10% and coefficients are large (see table 7). One standard deviation increase in the trend of log of GDP per capita is associated with a decrease by 0.27, 0.22 and 0.27 standard deviations in the trend of group membership, trust in others and the index of civicness, respectively. Overall, these figures provide some evidence supporting the hypothesis that the negative relationship between economic growth and social capital is driven by almost 1/4 by high income inequalities. Indeed, if we run the same regressions on the sample of countries with decreasing inequality results turn non

Figure 7: List of countries by time trends of their Gini index. Countries marked with a circle are those characterized by larger variations than the median, while those marked with a triangle are characterized by smaller variations. A vertical dashed line centered on the median value helps a better visualization of the two groups of countries.



Table 7: Correlations among long term trends of SC proxies and log of GDP per capita in countries with rising inequality (standardized variables).

	(1) group membership	(2) trust in others	(3) index of civicness
log of GDP	-0.276** (-3.84)	-0.223** (-2.70)	-0.273** (-2.62)
Constant	0.266** (2.43)	-0.160 (-1.20)	-0.279* (-1.86)
Observations	13	13	13
Adjusted R^2	0.155	0.034	0.044

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

significant and eventually positive ¹³.

6 Summary and concluding observations

Does a greater social capital go with economic growth? A long lasting debate in the economic discipline agrees that higher stocks of social capital enhance economic growth. Having largely focused on stocks of social capital, previous studies overlooked its time relationship with economic growth. Indeed, while it might seem obvious that a high level of trust in others improves business relations - thus fostering economic growth - it is not granted that a similar relationship holds over time. For example, this is what is suggested by Putnam's work. In his inspiring book, the author documents that one of the most developed country in the World - US - is experiencing a long lasting decline of social capital.

Is it possible that economic growth brings about an erosion of social capital? Only one study dealt with this issue finding that economic growth is negatively associated to an increase in trust in others (Roth, 2009). Present work further tests the relationship between social capital and economic growth both in terms of stocks and variations over time of social capital. Adopting the WVS/EVS integrated data-set, this research overcomes some of the limitations of previous works using a larger set of proxies of social capital, focusing on a wide set of developed and developing countries and adopting various time perspectives.

Results confirm and enrich previous evidence on a positive association between stocks of social capital and economic growth. Across a sample of 54 developed, developing and transition countries, a higher level of social capital goes with a higher GDP. Moreover, in the case of participation in groups and associations and trust in others a U-shaped relationship is better approximating the data. Estimates suggest that for countries with a GDP per capita lower than 3250 US\$ economic growth is associated with lower endowments of social capital. Beyond that threshold, the relationship turns positive. This result is reassuring: even if the early stages of economic development are associated with lower levels of social capital, the development process itself will solve the problem. All that we need is time and fostering economic growth. Hence, will raising GDP (or social capital) increase social capital (or GDP)? Unfortunately, the answer is negative.

¹³Figures are available from the author upon request.

Considering time trends computed over periods longer than 10 years for both developed and developing countries, the variation of social capital is negatively associated with economic growth. This result holds for three proxies of social capital (group membership, trust in others and civicness) and various time spans. Contrary to what expected, economic growth seems associated with an erosion of social capital.

Various hypothesis can be formulated to explain the contrast between the correlation of stocks and variations of social capital with economic growth. A reasonable one refers to the role of income inequality. In this paper I provided some evidence in favour of the hypothesis that the negative relationship among trends is driven by economic inequality. In countries with stronger increases in inequality, trends of social capital are negatively correlated with economic growth. On the contrary, for countries where economic growth is accompanied by negative or modest increases in inequality the same relationship turns non significant.

We must be very cautious in drawing any strong conclusion from this evidence. Issues of endogeneity and the limitations imposed by data-availability constrain the scope of this paper. However, it seems safe to say that results stating a positive correlation between stocks of social capital and economic growth can not be directly extended to the time-series relationship.

Of course, more research on the nature and direction of the relationship between economic growth and social capital is needed. Hopefully, the availability of new data will allow to address these issues in more detail in coming years.

A Appendix: descriptive statistics for countries with at least 2 years of observations

variable	mean	sd	min	max	obs	missing
group membership	0.590	0.492	0	1	245402	0.115
trust in others	0.324	0.468	0	1	265225	0.0432
index of civicness	0.0811	0.937	-4.900	0.768	232249	0.162
ln of GDP per capita	8.852	1.374	5.679	10.93	269299	0.0285
Gini index	35.92	10.30	20.13	65.47	239624	0.136

Table 8: Patterns of missingness in the pooled data-set.

variable	wave 1	wave 2	wave 3	wave 4	wave 5	wave 6	total
group membership	0	0.157	0.039	0.265	0.051	0.040	245402
trust in others	0.061	0.068	0.031	0.040	0.032	0.033	265225
index of civicness	0.057	0.097	0.201	0.263	0.177	0.034	232249
ln of GDP per capita	0.011	0.006	0.047	0.046	0.022	0.016	269299
Gini index	0.063	0.030	0.000	0.042	0.370	0.359	239624

Table 9: Patterns of missingness across waves.

B Appendix: descriptive statistics for countries with at least 15 years of observations

variable	mean	sd	min	max	obs	missing
group membership	0.596	0.491	0	1	189226	0.0602
trust in others	0.352	0.477	0	1	192353	0.0447
index of civicness	0.0626	0.943	-4.900	0.768	172626	0.143
ln of GDP per capita	9.292	1.115	5.763	10.65	199231	0.0105
Gini index	34.36	10.50	20.13	65.47	174615	0.133

Table 10: Patterns of missingness in the pooled data-set.

variable	wave 1	wave 2	wave 3	wave 4	wave 5	wave 6	total
group membership	0.000	0.139	0.040	0.081	0.002	0.046	189226
trust in others	0.061	0.068	0.036	0.030	0.033	0.031	192353
index of civicness	0.057	0.098	0.189	0.345	0.062	0.032	172626
ln of GDP per capita	0.011	0.006	0.000	0.023	0.000	0.018	199231
Gini index	0.063	0.031	0.000	0.070	0.298	0.415	174615

Table 11: Patterns of missingness across waves.

C Appendix: correlations from pooled data

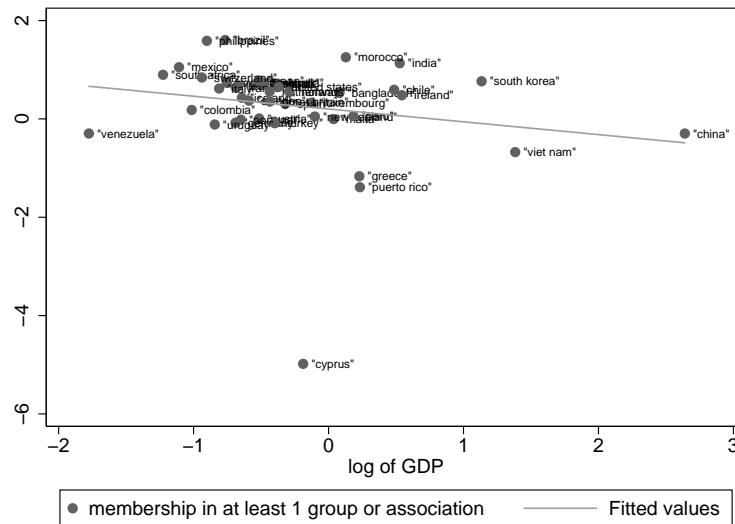
Table 12: Cross-section correlations among SC proxies and log of GDP per capita.

	(1) group membership	(2) group membership	(3) trust in others	(4) trust in others	(5) civicness	(6) civicness
log of GDP	0.326* (1.99)	-5.667** (-3.02)	0.547*** (4.23)	-6.117*** (-4.65)	0.359** (2.78)	-2.573 (-1.50)
log of GDP (squared)		6.010** (3.24)		6.682*** (5.10)		2.941* (1.75)
Constant	-5.49e - 09 (-0.00)	-9.62e - 09 (-0.00)	2.27e - 09 (0.00)	-2.32e - 09 (-0.00)	-1.62e - 09 (-0.00)	-3.64e - 09 (-0.00)
Observations	54	54	54	54	54	54
Adjusted R^2	0.089	0.274	0.286	0.522	0.112	0.143

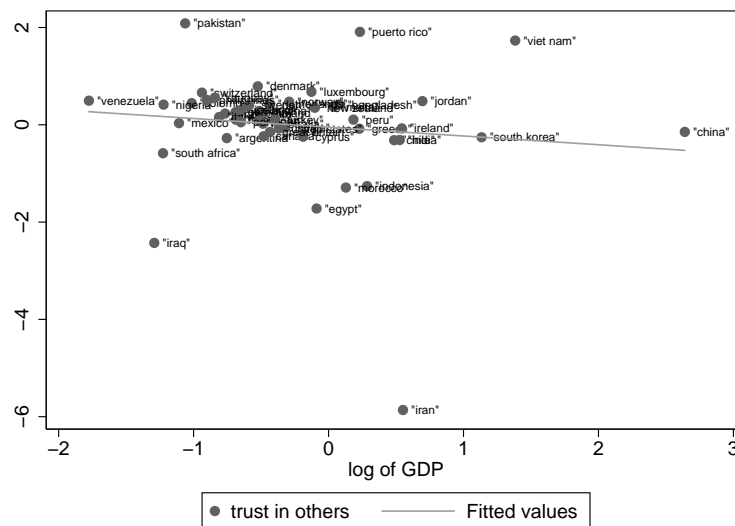
t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

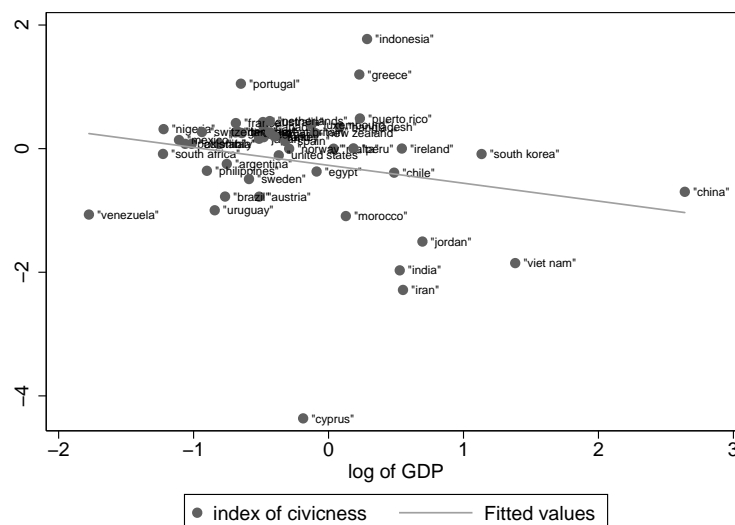
D Appendix: correlations among trends over at least two waves



(a) membership in groups and associations.



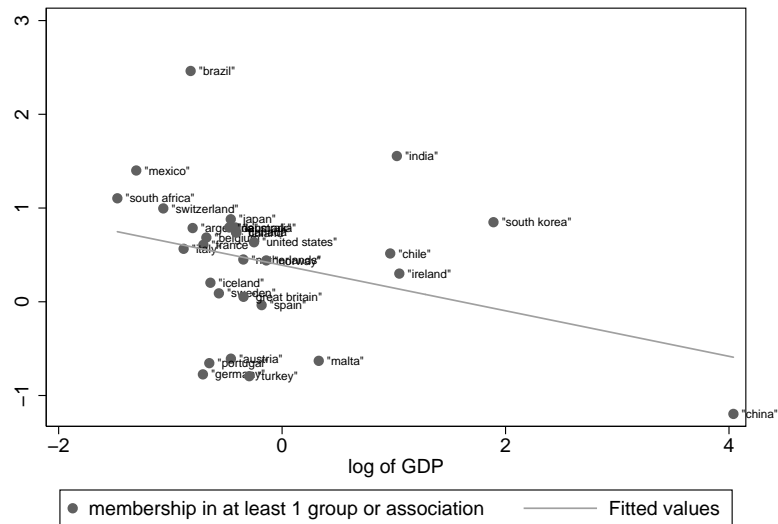
(b) trust in others.



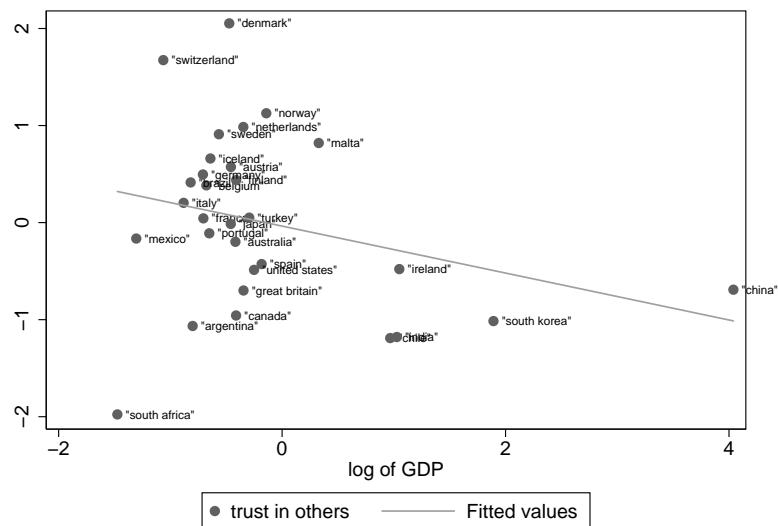
(c) index of civiness.

Figure 8: Correlations among trends of GDP and proxies of social capital for periods of at least two years. Each dot on the scatterplots associates the trend of social capital - on the y axis - with the trend of the logarithm of GDP. The regression line simply depicts the correlation between the two variables.

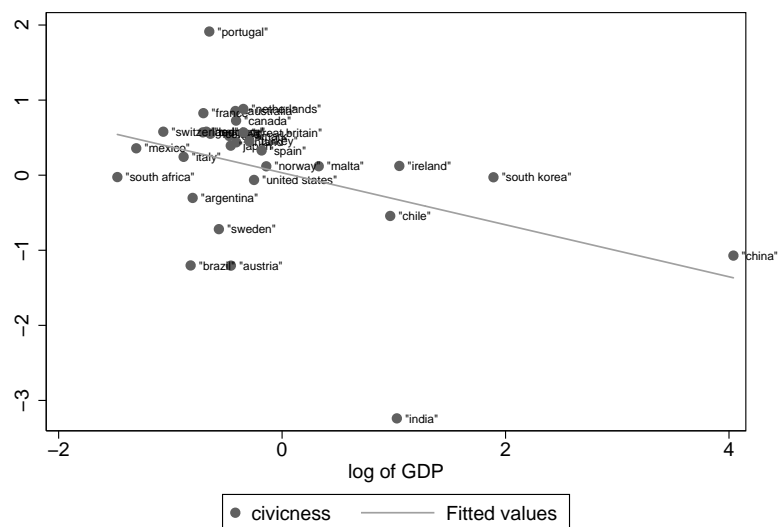
E Appendix: correlations among trends over at least 15 years



(a) membership in groups and associations.



(b) trust in others.



(c) index of civicness.

Figure 9: Correlations among trends of GDP and proxies of social capital for periods of at least 15 years. Each dot on the scatterplots associates the trend of social capital - on the y axis - with the trend of the logarithm of GDP. The regression line simply depicts the correlation between the two variables.

F Appendix: list of groups and associations mentioned in the WVS/EVS questionnaire

Respondents were asked to mention whether they belonged or were performing unpaid voluntary work for any of the following list of associations:

- social welfare service for elderly;
- religious organization;
- education, arts, music or cultural activities;
- labour unions;
- political parties;
- local political actions;
- human rights;
- conservation, the environment, ecology, animal rights;
- conservation, the environment, ecology;
- animal rights;
- professional associations;
- youth work;
- sports or recreation;
- women's group;
- peace movement;
- organization concerned with health;
- consumer groups;
- other groups.

G Appendix: factor analysis for the index of civic cooperation

In the pooled sample, factor loadings range from .70 to .78 thus suggesting that the four variables contribute equally to the definition of civic cooperation. The picture does not change much when observing results wave by wave. In this case, factor loadings stay approximately constant across waves.

The slight variability among factor loadings both in the pooled sample and within waves support the decision to build an aggregated index of civic cooperation resulting from the standardized weighted average of the four items.

Table 13: Factor loadings and unique variances for the pooled sample

	Factor 1	Psi
justifiable: claiming government benefits	.709	.496
justifiable: avoiding a fare on public transport	.765	.414
justifiable: cheating on taxes	.783	.386
justifiable: someone accepting a bribe	.719	.482

Table 14: Factor loadings and unique variances across waves

wave 1	Factor 1	Psi
justifiable: claiming government benefits	.745	.443
justifiable: avoiding a fare on public transport	.793	.370
justifiable: cheating on taxes	.735	.458
justifiable: someone accepting a bribe	.634	.597
wave 2	Factor 1	Psi
justifiable: claiming government benefits	.678	.539
justifiable: avoiding a fare on public transport	.759	.423
justifiable: cheating on taxes	.751	.434
justifiable: someone accepting a bribe	.641	.588
wave 3	Factor 1	Psi
justifiable: claiming government benefits	.706	.500
justifiable: avoiding a fare on public transport	.773	.400
justifiable: cheating on taxes	.794	.368
justifiable: someone accepting a bribe	.664	.558
wave 4	Factor 1	Psi
justifiable: claiming government benefits	.675	.543
justifiable: avoiding a fare on public transport	.751	.434
justifiable: cheating on taxes	.791	.373
justifiable: someone accepting a bribe	.746	.442
wave 5	Factor 1	Psi
justifiable: claiming government benefits	.747	.440
justifiable: avoiding a fare on public transport	.795	.367
justifiable: cheating on taxes	.824	.319
justifiable: someone accepting a bribe	.789	.377
wave 6	Factor 1	Psi
justifiable: claiming government benefits	.711	.494
justifiable: avoiding a fare on public transport	.725	.473
justifiable: cheating on taxes	.787	.379
justifiable: someone accepting a bribe	.737	.455

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