Making Capitalism Work:
Social Capital and Economic
Growth in Italy, 1970-1995

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Making Capitalism Work: Social Capital and Economic Growth in Italy, 1970-1995 Varieties of Trust

Summary

Using data on the 20 Italian regions for the period 1970-1995, I examine whether the presence of social capital, as reflected in a number of different measures collected by Putnam (1993), affects economic productivity. I find three types of effects. First, social capital, when treated as an input to regional production, has a positive and significant effect in the South, but a much weaker effect in the North. Second, some forms of social capital can significantly increase regions' propensities to make physical capital investments; however, dense networks of association reduce capital investment in both the North and South. Instrumental variables estimates show that social capital affects growth both directly and through affecting investment in physical capital. Third, social capital contributes positively to the rate of total factor productivity growth in the Italian regions.

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1. Introduction

Social capital is not a new concept,[2] but it has only recently begun to attract attention from economists and other social scientists.[3] The proper definition of the term remains controversial, but Ostrom (2000, p. 176) characterizes it as "the shared knowledge, understandings, norms, rules and expectations about patterns of interactions that groups of individuals bring to a recurrent activity."[4] The work that has drawn the most attention to social capital is Robert Putnam's *Making Democracy Work: Civic Traditions in Modern Italy* (1993), which argued that the performance of Italy's 20 regional governments can be linked directly to the extent of civic spirit and associations in the various regions. While Putnam focused on the performance of government, economists are more interested in the effects of social capital on economic performance. In this paper, I examine whether the measures of social capital developed by Putnam have a measurable impact on economic output, capital investment, and total factor productivity growth in the various Italian regions.[5]

The notion that social capital may affect economic growth is not terribly surprising. Trust may reduce the transaction costs of contracting by constraining opportunism, thereby promoting capital investment. Norms of reciprocity may suppress free riding, thereby enhancing the voluntary provision of local public goods. Networks of association may speed information transfer, strengthening the knowledge spillovers that help create fast-growing innovation clusters. At the same time, Olson (1982) has stressed that the proliferation of organized interest groups (one form

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[2] Narayan (1999) traces it back as early as the work of Lyda J. Hanifan in 1916.

[3] See, for example, Loury (1977), Coleman (1990), Ostrom (1990), and Becker (1996).

[4] Narayan (1999), p. 6.

[5] Helliwell and Putnam (1995) also examine the effects of social capital on economic growth, but because they do not have data on capital investment, they focus simply on growth in gross domestic product per capita.

of social capital) can choke off economic growth. The relative importance of these various aspects of social capital is thus ultimately an empirical issue.

While the notion that social capital may affect growth is familiar, attempts to measure the impact of social capital quantitatively are few, and their results to date have been somewhat contradictory. Helliwell and Putnam (1995) find that a composite measure of social capital (similar to that used here) was positively associated with growth in per capita income in Italy over the period 1950-1990. However, Helliwell (1996) finds that survey measures of trust and group memberships are negatively and significantly associated with total factor productivity growth in a sample of 17 OECD countries. Inglehart (1994b) finds a negative relationship between social capital and growth for high-income countries, but a positive relationship for low-income countries. Knack and Keefer (1997) find that positive attitudes toward trust and cooperation have a significant positive effect on growth in GDP/capita and (less significantly) on investment/GDP for a sample of 29 market economies.[6] However, when investment's share of GDP is included as a right-hand side variable, the social capital variables are no longer significant. Knack and Keefer also study the effects of group membership on economic performance, finding that groups have no significant effect on income growth, but that some types of groups actually appear to retard investment.

Overall, then, previous empirical work speaks with several voices: trust has a positive effect on growth in income per capita, but this effect is negligible when capital investment is properly controlled for. Trust appears to be positively associated with investment but group membership is negatively associated with investment, while both trust and group membership appear to be negatively associated with growth in total factor productivity, except perhaps in low-

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[6] Their data on attitudes come from the World Values Survey, further details on which are available in Inglehart (1994).

income countries. Furthermore, these results come from a variety of different data sets and time periods, making it difficult to assemble a unified story about the economic effects of social capital.

This paper revisits the foregoing issues using detailed data on the twenty Italian regions over the period from 1970 to 1995. It uses the measures of social capital developed by Putnam (1993) to explore the links between social capital and economic output. Unlike Helliwell and Putnam (1995), however, I have access to capital investment data on a regional basis, allowing for detailed analyses of regional production functions, capital investment, and total factor productivity growth, rather than just income/capita.

There are three main findings. First, when considered as a factor of production, social capital has a measurable and generally positive effect on economic productivity in Italy, even after controlling for levels of capital investment. This effect appears weaker in the relatively developed North than in the relatively underdeveloped South, however. Second, social capital (with the exception of networks of association) is positively and significantly associated with capital investment (dense networks reduce investment in both North and South). Furthermore, instrumental variables estimations show that social capital affects productivity through both its effects on investment and its direct effect on output. Third, although rates of total factor productivity (TFP) improvement are negatively correlated with all of Putnam's measures of social capital, when initial levels of value added in each region are controlled for, social capital is found to have a positive (though only marginally significant) effect on TFP growth. This last result contrasts with the international studies of Inglehart (1994b) and Helliwell (1996), raising questions about whether Italian social capital is somehow different than that in other countries, or whether inter-regional and international studies are driven toward different results for other reasons.[7]

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[7] Knack and Keefer (1997) find an insignificant, but generally positive, relationship between social capital and total factor productivity.

Section 2 discusses the links between social capital and economic growth, setting the stage

for the empirical work to follow. Section 3 presents the basic model to be estimated, while section

4 describes the data used. Section 5 offers the empirical results, and section 6 concludes.

2. Social Capital and Economic Growth

The study of the role of social capital in economic activity is still in its infancy. No

comprehensive theoretical explanation has been advanced to explain exactly how particular aspects

of social capital affect economic productivity. Nevertheless, it is possible to sketch some of the

more important aspects of social capital that have been discussed by economists and political

scientists, and to identify some of the ways in which these might be valuable.[8]

At the broadest level, social capital is sometimes taken to indicate the degree of generalized

trust (i.e., trust of persons whom one does not know directly) exhibited by members of a

community. This is illustrated vividly in the context of rotating credit associations, in which all

members contribute regularly and equally to a fund that is given to each member in turn on a

rotating basis; such associations are apparently common throughout the world.[9] Once a member has

had his turn to receive the fund, of course, he has strong incentives to immediately stop contributing.

In order for the association to function, members must trust that this will not happen. And in

practice such opportunism is not common, perhaps because of the threat of ostracism by other

members of the group and the potentially far-reaching impact on the individual's reputation.

Two elements of social capital have received particular attention: networks of association

and norms of generalized reciprocity. Networks of association allow individuals to develop a

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[8] The discussion in this section draws heavily on Putnam (1993) and Narayan (1999).

[9] Putnam (1993), pp. 167-171.

reputation for trustworthiness with a large number of others at once. This facilitates a broad, community-based sense of trust. To the extent these networks overlap in different ways, "cross-cutting ties" are created that can help build shared norms across various social groups. Generalized reciprocity is exhibited in any long-term relationship in which one party contributes now in the expectation that he will receive later. Norms supporting such behavior allow for the sharing of labor, equipment, and other assets by individuals. A dense set of social networks with cross-cutting ties can support the development of shared norms of generalized reciprocity.

How can networks, norms and trust contribute to economic productivity? One obvious avenue is by reducing transaction costs. Between parties who do not trust one another, any long-term arrangement must be supported by a carefully drafted contract, the more complete the better. Writing fully complete contracts is impossible, however, and even moderately detailed ones can be quite costly to craft. In many Italian regions, however, Brusco (1992, p. 182) notes that "contracts between companies very often refer to the customary conventions of the particular area...The existence of these implicit specifications, deriving from local customs and history and rooted in a language that is well understood by everyone, enables firms to draw up spot contracts with very low specification costs...This set of rules, shared by everyone and to which everyone has to adapt, originates in civil society, and also carries a series of sanctions: whoever breaks the rules of the game is excluded from the community and can no longer work within it." Norms can provide implicit understandings that discourage opportunistic behavior, effectively filling the gaps in incomplete contracts and thereby supporting valuable specialized investments.

Norms of reciprocity may also help suppress free riding behavior and allow for the voluntary provision of collective or public goods. Ostrom (1990) provides concrete evidence of such behavior in her study of self-governing institutions for the management of common pool

resources (CPRs). As she points out (pp. 183-184), in small-scale CPR settings, "individuals repeatedly communicate and interact with one another in a localized physical setting. Thus, it is possible that they can learn whom to trust, what effects their actions will have on each other and on the CPR, and how to organize themselves to gain benefits and avoid harm. When individuals have lived in such situations for a substantial time and have developed shared norms and patterns of reciprocity, they possess social capital with which they can build institutional arrangements for resolving CPR dilemmas."

If social capital can support investment in specialized assets and facilitate the production of collective goods, it may be very valuable indeed. These features have been discussed in detail in the literature on the industrial districts of Italy.[10] For example, Brusco (1992, p. 180) notes the element of specialized investment: "Often, an item or component is not ordered on the basis of a precise design, with detailed specifications. Rather, the customer explains to the subcontractor the intended function of the item, and is then ready to consider whether a standard component already on the market, and therefore less costly, might be used or, on the other hand, whether it might be prefereable to stay with the original subcontractor, modifying the design of the component, if necessary, to make manufacture for the subcontractor easier." The features of collective goods arise whenever small firms form consortia for purchasing of inputs, obtaining credit, hiring accountants for book-keeping and taxes, promoting products at trade fairs, etc.

A third pathway by which social capital may affect economic growth is by facilitating innovation. As Putnam (1993, p. 161) puts it, "Networks facilitate flows of information about technological developments, about the creditworthiness of would-be entrepreneurs, about the reliability of individual workers, and so on. Innovation depends on `continual informal interaction

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[10] See, for example, the studies in Pyke and Sengenberger (1992).

in cafes and bars and in the street.' " Recent empirical work in industrial organization documents that spillovers are typically stronger for agents in geographical proximity to one another, and that important spillovers exist across industries as well as within them.[11] The "new growth theory" shows formally how such spillovers can lead to sustained economic growth over time.[12] When spillovers are important, firms often take advantage of them by clustering together in a particular region, as Krugman (1990) has recently emphasized. Perhaps the most highly developed form of such "agglomeration economies" appears in the form of "industrial districts," tight geographical clusters of highly specialized firms working in the same industry. Marshall (1920) was fascinated by such districts around the turn of the century, and their economic performance has been the subject of considerable academic interest in recent years.[13] The small and medium-sized enterprises (SMEs) of the "third Italy" are often taken as the prototypical modern example of such districts.[14] Piore and Sabel (1984) make much of the flexible and decentralized mode of production in the industrial districts, arguing that it presents a model for innovative firms in the post-industrial era.

Not all authors see social capital as a purely benign resource. Although he does not use the term "social capital," Olson (1982) presents a theory in which networks of association influence government to provide them with special favors. In stable societies, such networks grow increasingly dense, diverting resources from productive activity to rent-seeking, and gradually

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[11] Jaffe (1986) examines spillovers across industrial firms, while Jaffe (1990) studies spillovers from universities to private firms. Audretsch and Feldman (1995) focus on the geographical concentration of spillovers.

[12] See, for example, Romer (1986, 1990) and Grossman and Helpman (1991).

[13] Piore and Sabel (1986) discuss examples of industrial districts from a variety of different countries.

[14] The "third Italy," located in the north-central part of the country, allegedly fits neither the form of the heavily industrialized regions of the North, nor the underdeveloped regions of the South. Bianchi (1994, p. 17), however, argues that "The three geo-economic formations...no longer accurately describe contemporary multi-regional development in Italy. The Third Italy, in particular, shows a visible diaspora, if the regions which constituted it today belong to four, or perhaps five, different families."

choking off economic growth. Economic growth thus sows the seeds of its own eventual decline.

In this view, social capital may well hinder innovation, as interest groups threatened by economic

change use the apparatus of the state to slow its encroachment. This story is consistent with the

empirical results of Inglehart (1994b) and Helliwell (1996), as described earlier. Both the "light"

and the "dark" sides of social capital must be recognized in any mature understanding of the

concept.

Given the importance of industrial districts in the Italian economy, the nation's tightly-knit

social fabric, and the influential nature of Putnam's (1993) study, Italy is a particularly appropriate

place to assess empirically the economic contribution of social capital. I turn next to the empirical

framework used to do so in this paper.

3. A Simple Model

The basic model I use is a simple extension of the standard production function. Let the

fundamental production relationship be $Y_{it} = F(K_{it}, L_{it}, S_i, A_{it})$, where $Y, K, L, S,$ and A are, respectively,

value added, capital, labor, social capital, and a productivity measure. All variables except S are

subscripted by both i and t to indicate that they vary with region i and time t; social capital alone is

assumed not to change over time and varies only by region. Let lower-case variables be the natural

log of the corresponding upper-case variables, e.g. $y_{it} = ln\ Y_{it}$.

Following Griliches (1995), I take the functional form of the production relationship to be

of the Cobb-Douglas form, so $Y_{it} = A_{it}\ K_{it}^{\alpha} L_{it}^{\beta} S_i^{\gamma}$. In addition, for simplicity, I assume that $A_{it} = e^{\delta_i t}$.

The basic relationship that I estimate can then be written as $y_{it} = \delta_i t + \alpha k_{it} + \beta l_{it} + \gamma S_i$.

My empirical results include estimation of the parameter γ, testing for the possible dependence of investment K on social capital S, and testing for the dependence of δ on S. First, however, I turn to a discussion of the data to be used.

4. Data

The economic data analyzed here are from ISTAT, the Italian national statistical bureau, and cover the period from 1970 to 1995. Data were collected for 17 industry sectors across the 20 Italian regions, providing 340 basic units of observation for the 26 year period. Included in this category are data on value added, an industry-level deflator for value added, capital investment, employment, and payments to labor. Data on capital investment were not available at the level of individual industries, so it was necessary to aggregate all production activity at the level of the region, thus collapsing the number of individual units of observation to 20. Data on value added were deflated using the industry-specific deflators, and then summed to create an aggregate measure of real value added at the regional level. Data on capital investment were deflated using the aggregate deflator defined by dividing real value added by nominal value added. Summary statistics are presented in Table 1.

Data on social capital in the Italian regions were generously provided by Robert Putnam, who discusses the data in engrossing detail in his 1993 book, *Making Democracy Work*. Here I provide a capsule summary of the data. There are nine basic measures of social capital, four of which are based on "modern" data from 1953-1987, and five of which are based on "historical" data from 1860-1921. The measures are of three general types of phenomena: 1) Voting (4 measures), 2) Newspaper readership (1 measure), and 3) Civic associations (4 measures). In

addition, there are two summary indices, one for each of the time periods mentioned. Summary

statistics for all variables are presented in Table 1.

The four voting measures cover several different items. Two of the measures—referendum

turnouts and preference voting—are from the latter part of the twentieth century. Putnam (1993, p.

93) notes that standard measures of electoral turnout may not provide a good indication of civic

spirit or social capital, because until recently Italian law required all citizens to vote in general

elections. However, this requirement did not apply to national referenda, so *referendum turnout*

provides a better measure of how engaged citizens are in public affairs. The topics of referenda

during this period included the legalization of divorce, public financing of political parties, public

security and anti-terrorism, wage escalator clauses, and nuclear power. Conversely, *preference*

voting indicates lack of true civic engagement. Italian voters must vote a single party, and

legislative seats are then allocated to parties on a proportional basis. However, voters can also

choose to indicate their preference for a particular candidate from the party list they have selected.

Most voters do not bother to do so, but according to Putnam (1993, p. 94), "in areas where party

labels are largely a cover for patron-client networks, these preferences votes are eagerly solicited

by contending factions...The incidence of preference voting has long been acknowledged by

students of Italian politics as a reliable indicator or personalism, factionalism, and patron-client

politics..." The reported coefficients on preference voting in the results section are multiplied by

minus one to render their signs comparable to those of the other social capital measures.

Two other voting measures—strength of mass parties and electoral turnout—are taken from

the early part of the twentieth century. *Strength of mass parties* is based on the percentage of

voters who chose either socialist or Catholic candidates during the period 1919-1921. Putnam

(1993, p. 142) notes that "the two mass-based parties had common sociological roots in ancient

traditions of collective solidarity and horizontal collaboration. At the turn of the century they also shared opposition to the existing authorities. Both were weakest where the established conservative alliance, based on clientelist ties with established social elites of landowners and officeholders, was strongest." *Electoral turnout* for the period 1919-1921 is also included, as these were the only elections under "universal manhood suffrage" before Fascism imposed authoritarian rule upon Italy; voters in these elections were not required by law to participate, so the measure of electoral turnout is more informative for this period than for the modern period discussed above.

Newspaper readership provides a simple, modern measure of the extent to which citizens in a given region are interested in and informed about community affairs. There is a surprising amount of variation in this measure, from a high of 80% in Liguria to a low of 35% in Molise.

The third category of variables measures the breadth of participation in various civic organizations. One of these variables—association scarcity—is modern, while three—cooperatives, mutual aid societies, and associations founded before 1860---are historical. The measure of *association density* is computed as the negative of the number of inhabitants in a region divided by the number of sports and cultural associations in that region. (The negative is used to make the predicted sign of the coefficient for this variable positive, like the other social capital variables). The measure is surprisingly precise since it makes use of an exhaustive census of all associations in Italy, both local and national. Of these associations, 73% are sports clubs, while the remainder comprise such groups as choral societies, hiking clubs, and literary circles. *Cooperatives* during the period 1889-1915 came in a variety of forms; there were "agricultural cooperatives, labor cooperatives, credit cooperatives, cooperative rural banks, producer cooperatives, and consumer cooperatives, the latter comprising more than half of all cooperatives

by 1889."[15] The variable is measured in the years 1889, 1901, 1910, and 1915 as the number of cooperatives in a region per 1000 inhabitants; these are then aggregated into a factor index for the period. *Mutual aid societies* were also common at the turn of the twentieth century, and served a wide range of social insurance functions, including "benefits to aged and incapacitated members...; aid to families of deceased members; compensation for industrial accidents; funeral expenses; nursing and maternity care; and the provision of educational opportunities for members and their families, including night schools, elementary instruction, arts and crafts, and circulating libraries...In effect, mutual aid societies provided a locally organized, underfunded, self-help version of what the twentieth century would call the welfare state."[16] There is also a measure of the longevity of associations, measured as the percentage of associations identified in the 1982 census that were formed before 1860. This measure of *old associations* provides an indicator of the stability of cultural and civic activity in each region.

Finally, there are two variables—*civic community* and *civic traditions*—that aggregate the modern and the historical measures, respectively. All of the social capital variables are quite highly correlated, as indicated in Table 2. The correlation between the modern and the historical measures is particularly surprising, and underlines the continuing importance of culture and tradition in Italian life.

5. Results

Several different types of empirical results are reported in this section. I begin with the estimation of a simple model of growth in output per capita, which allows me to compare my

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[15] Putnam (1993, p. 139).

[16] Ibid., p. 139.

results against those of Helliwell and Putnam (1995), who use a similar, but less detailed, data set.

I then turn to more detailed estimations that make use of the full data set. In particular, I report

estimations of a regional production function that includes capital investment, labor, social capital,

and a time trend. I then turn to a recent criticism of Putnam's quantitative work on social capital in

Italy, namely that it may provide little additional explanatory power once the broad distinctions

between northern and southern regions of Italy are introduced. Using two different specifications, I

test for whether social capital continues to have a measurable impact after controlling for whether a

region lies in the North or the South of the country. Next, I consider the possibility that capital

investment depends on social capital, as suggested by the argument that social capital can reduce

the transaction costs of contracting. I also re-examine my production function results taking into

account the possible endogeneity of capital investment. Finally, I examine the relationship between

rates of total factor productivity improvement over time and social capital.

Growth in Output per Capita

As a baseline, I first estimate the growth in output per capita over the sample period, in

order to make my results comparable to those of Helliwell and Putnam (1995). To do so, I take as

the dependent variable the difference in the natural log of value added per capita in 1995 and the

value of this same variable in 1970. I then estimate the dependence of this variable on the initial

level of value added per capita, various measures of social capital, and the average level of capital

investment over the time period. Results are reported in Table 3.

Estimations (1) through (2) exclude capital investment, and report results for the modern

index of civic community and the historical index of civic traditions, respectively. Like Helliwell

and Putnam (1995), I find social capital is positively and significantly associated with growth in

output per capita. I also tested each of the individual measures of social capital separately, and found 7 to have positive and significant coefficients, 3 to be positive but not significant, and one to be negative but not significant. The measure with the highest t-statistic was the effect of mass parties, the results for which are reported in estimation (3). The results in estimations (1) through (3) are quite similar across the different specifications. Finally, estimation (4) includes a simple measure of the average level of annual capital investment in a region over the sample period, finding it to have a positive and significant effect on growth, and pointing toward the more detailed production function analysis to be reported next.

Regional Production Functions

The initial production function estimations are reported in Table 4. Estimation (1) presents the results without the inclusion of any social capital variables. The regression has very strong explanatory power, and the coefficients on all independent variables are positive and highly significant. Increasing returns to scale are evident at the regional level, as the sum of the coefficients on capital and labor is 1.074.[17] In this and in all of the other production function estimations, a test of the hypothesis of constant returns to scale (*i.e.* that $\alpha+\beta=1$) can be rejected at the 1% confidence level or better. Improved productivity over time is evident in the positive and highly significant coefficient on the number of periods, which shows a rate of productivity increase of 1.9% per year.

Estimations (2) and (3) include, respectively, the modern and historical index measures for social capital. In each case, the coefficients on the original independent variables change only modestly. More importantly, each measure of social capital has a positive and highly significant

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[17] An estimation with regional fixed effects yielded very similar results, with the elasticity to scale of 1.159 providing a somewhat higher estimate of returns to scale.

effect on productivity. Since these are index variables, they are constructed so as to have a mean approximately equal to zero and a standard deviation approximately equal to one. Thus, if social capital were to increase by one standard deviation, productivity would increase by roughly 9.0% in estimation (2) and roughly 10.25% in estimation (2). Although results are not reported here, any single one of the social capital measures, if included in the production function, is of the predicted sign and is highly significant.

Estimation (4) includes both index measures for social capital. The modern measure has a larger coefficient than in (2) and remains highly significant. The historical measure has a negative and significant coefficient. This suggests that social capital may be more valuable when it is of more recent creation. At the same time, the high correlation between the social capital measures, and the small number of regions, demand caution in interpreting the results of estimations with multiple measures of social capital. With this in mind, I turn now to examining whether the individual measures provide interesting results when used jointly as explanatory variables.

Estimation (5) includes all four of the modern measures of social capital, as well as the percentage of associations that pre-dated 1860; 520 observations are available for each of these variables. All but referendum turnout are highly significant. Less preference voting has a positive and significant effect on productivity, as expected; an increase of one standard deviation in the extent of preference voting would reduce productivity by about 3%. Greater news readership has a small, positive and significant effect, as expected; when news readership increases by one percent, productivity improves by 0.6%. Association density enters with the wrong sign and is significant. Finally, the greater the percentage of associations that are long-lived, the higher is productivity.

Estimation (6) includes all five of the historical measures of social capital. Three prove significant: membership in mass parties, formation of cooperatives, and formation of mutual aid

societies. All three are positive and significant at the 5% level or greater. Electoral turnout and longevity of associations are positive but not significant at the 10% level.

Estimation (7) includes all nine measures of social capital (excluding the aggregated index measures). Of the modern measures, preference voting, news readership, and association scarcity are of the expected signs and significant. Of the historical measures, cooperatives and electoral turnout are significant and of the expected sign, while mutual aid societies and longevity of associations are significant but of the wrong sign.

In summary, the measures of social capital tested in Table 4 produce significant coefficients of the expected sign in 14 cases, and significant coefficients of the opposite sign in 4 cases. Any single measure of social capital, when included in the production function, has a positive and highly significant effect on output. However, anomalies crop up as more variables are included, perhaps due to the high correlation between the various measures. Four measures are consistently significant and of the correct sign, even when combined with other explanatory variables: the modern community index, preference voting from 1953-1979, newspaper readership in 1975, and formation of cooperatives from 1889-1915.

The "Two Italies"

In a recent critique of Putnam's (1993) quantitative work, Goldberg (1996) argues that Putnam's measures of social capital provide little or no additional explanatory power once a dummy variable for "North" or "South" is included in the analysis. Indeed, it is widely recognized that the northern and southern parts of Italy are radically different in many respects, including their income levels. The contrast between the two parts of the country is so sharp as to engender the common phrase "the two Italies" and to provoke discussion of "the southern problem." Although

Putnam is concerned with measuring the performance of government while I am concerned with economic performance, Goldberg's critique may be applicable here as well: the measures of social capital used here may simply be proxies for broad differences between northern and southern Italy, and may provide little or no additional explanatory power once the north/south distinction is controlled for. I turn next to exploring this possibility.[18]

Table 5 presents some summary statistics for the northern and southern portions of Italy.[19] On all dimensions, northern Italy is numerically highly superior to southern Italy. Tables 6-8 present the results of a series of estimations that account in various ways for the differences between North and South. Table 6 presents three estimations that include a dummy variable separating regions into North and South. Table 7 explores growth in northern Italy in more detail, while Table 8 does the same for southern Italy.

In Table 6, estimation (1) simply considers the production function with a dummy variable for "South" included.[20] The dummy variable is negative and highly significant, as expected. Estimation (2) adds in the two summary measures of social capital, one for the modern period and one for the historical period of a century ago. Both measures of social capital are positive and significant at the 11% level; the modern index is significant beyond the 0.1% level. Interestingly, the dummy variable changes signs once the two measures of social capital are included. This suggests that once physical capital, labor, and social capital are controlled for, the South is actually more productive than the North. Put another way, the South's lower level of economic output

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[18] I do not attempt to subdivide Italy into three or more separate regions. Bianchi (1994) shows that a tripartite division of the country (North, South, and the "third" or central part) is no longer justifiable based on quantitative data, and divisions into four or more parts would render the impact of social capital untestable.

[19] I have included as northern the following regions: Piemonte, Lombardia, Valle d'Aosta, Trentino-Alto Adige-Sudtirol, Veneto, Friuli-Venezia-Giulia, Liguria, Emilia-Romagna, Toscana, Umbria, and Marche. The southern regions are Lazio, Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicilia, and Sardegna.

[20] Although the regressions were run with a constant term, it is not reported here in the interest of keeping the table on a single page.

appears to be due to its lower levels of productive inputs, not the use of inferior production techniques.

Estimation (3) adds the full panoply of social capital measures (omitting the composite index measures). Preference voting, newspaper readership, associational density, and the presence of mass parties during 1919-1921 all are highly significant and have the expected sign. Formation of mutual aid societies and longevity of associations are significant but have the opposite sign to what was expected. The performance of the social capital measures is thus mixed. Nevertheless, Goldberg's (1996) critique does not seem to apply to these estimates of economic production—even when we control for the existence of the "two Italies," quantitative measures of social capital appear to have significant economic effects.

Tables 7 and 8 explore northern and southern Italy, respectively, in more detail. Although the results are not presented here, I ran a set of 22 regressions (11 each for North and South) each containing a single measure of social capital. In 19 cases, including all 11 runs for the South, the coefficient on the social capital variable was of the expected sign and highly significant. In the North, referendum turnout and associational density had the wrong signs and were significant, while mutual aid societies were not statistically significant. From these runs taking a single measure of social capital at a time, Goldberg's critique does not apply to the South at all, and is largely incorrect for the North as well. The results in Tables 7 and 8 examine the performance of various combinations of social capital variables.

In Table 7, estimation (1) confirms that the basic production function for the North (without social capital) differs little from the function estimated for the country as a whole. Estimation (2) finds the modern index of social capital has a positive and highly significant coefficient, while the historical index is negative and significant. Estimations (3) and (4) examine the set of modern and

historical measures, respectively. Of the modern measures, newspaper readership is positive and highly significant, as expected, but associational density is negative and highly significant, contrary to expectations. Of the historical measures, cooperatives and electoral turnout have the expected sign and are significant, but mass parties, mutual aid societies, and longevity of associations are significant and have signs contrary to expectations.

This set of results indicates that combinations of social capital measures—at least as captured by Putnam's variables—do not perform as well for the North as they do for the country as a whole. In some ways, this is not surprising since the number of observations has been cut roughly in half. However, five variables have the wrong sign while only four have the expected sign; Goldberg's critique clearly has some bite when the North is considered separately and multiple social capital measures are included. While these results must be interpreted cautiously, they are not inconsistent with Olson's (1982) hypothesis regarding the potentially deleterious effects of self-interested associations on growth in developed countries. They are also consistent with the results of Inglehart (1994b), who found that social capital tended to reduce growth in more developed countries, but enhanced it in less developed countries.

Table 8 considers the South separately. Again results are mixed, but they are better than for the North. Seven measures enter with the correct sign and are significant, while two are significant and of the wrong sign. The modern index of social capital performs well, as do the measures of referendum turnout, preference voting, associational density, cooperatives, historical electoral turnout, and longevity of associations. Mass parties and mutual aid societies, however, are significant and enter with the wrong sign. Apparently social capital has a more beneficial impact in the South than in the North.

Overall, the results for the "two Italies" indicate that Putnam's measures of social capital retain significance when applied to the North and the South of Italy separately. They are not as powerful at this level, however. When considered one at a time, nineteen variables have significant coefficients of the correct sign, while two have significant coefficients of the wrong sign. When combinations of variables are examined, sixteen significant coefficients have the correct sign, while nine do not. In concert with other variables, only the modern index of social capital is consistently successful in explaining economic productivity, although the historical formation of cooperatives and historical election turnout also have explanatory power in both parts of the country. Of particular interest is the fact that a majority of the individual social capital measures have a negative impact on output in the North, while the reverse is true in the South. This provides a measure of support for Olson's (1982) hypothesis regarding the negative relationship between group formation and economic growth in developed economies. Further research probing detailed measures should help to separate out measurement problems from meaningful causal effects of specific forms of social capital in more and less developed regions.

Physical Capital and Social Capital

One of the explanations for why social capital may contribute positively to economic growth is that it reduces the transaction costs of writing contracts to solve holdup problems. This suggests that capital investment may depend upon social capital. Knack and Kiefer (1997) found somewhat tenuous evidence to support this hypothesis, with some measures of social capital contributing positively to investment but with their measure of association density having a negative effect. In this section, I test this hypothesis using the detailed year-to-year data on capital investment available in my data set.

In these regressions the dependent variable is the natural log of real capital investment. As mentioned earlier, I do not have reliable data on regional capital investment at the level of the industry sector. However, I do have data on the value added by sector for each region and year. I use this data to construct a variable that measures the standard deviation of value added in each region on an annual basis. The hypothesis is that regions with output concentrated in particular sectors will have better access to the financial capital needed to expand their capital stocks. Italy is not known for the advanced state of its financial markets, and larger firms with substantial free cash flow or groups of firms with good access to financial markets may be in better positions to invest in physical capital. The standard deviation of value added is intended to proxy for this effect.

Estimation (1) includes as independent variables the time period, a dummy variable for the South, the standard deviation of value added, and the modern index of civic community. All of the independent variables are highly significant and have the expected signs. Capital investment has been increasing over time. More surprisingly, the South has a significantly higher level of investment than the North. This may be due to the various deliberate attempts by the Italian government to channel investment into the South, though I cannot confirm that speculation empirically. Variance in value added has a large and significant negative impact on investment, as expected. The modern index of civic community has a positive and significant coefficient.

Estimations (2) through (5) repeat the exercise with alternative measures of social capital. Through all of the estimations, variance in value added has a highly significant and negative impact on investment. Of particular interest is estimation (4), which measures the effect of associational density on investment. Like Knack and Keefer (1997), I find that a dense network of associations is negatively and significantly associated with capital investment.

I also estimated the investment function separately for the North and South of Italy. The results for the North were very similar to those for the country as a whole. The results for the South, however, tended to show an insignificant growth in capital investment over time and an insignificant effect of variance in value added on investment. Despite these differences, the role of social capital was quite consistent across the two parts of Italy. While the magnitude of the effects of particular measures of social capital differed across the two Italies, their sign and level of statistical significance were generally the same.[21] In particular, this held true for the role of associational density: it was negatively and significantly associated with investment in both halves of the country. This was the most striking "dark side" to social capital identified in this project.

Given the dependence of capital investment on social capital, I re-estimated the regional production function allowing for this endogeneity. The results are presented in Table 10. Estimation (1) establishes a benchmark using OLS, and including the two index measures of social capital along with the standard deviation of value added. The coefficient on standard deviation of value added is small and not statistically significant. This variable thus appears to be a good candidate as an instrument for capital investment.

Estimation (2) uses two-stage least squares and uses the standard deviation of value added as an instrument for capital investment. Since the index of civic traditions is not significant at the 10% level in estimation (1), estimation (2) focuses on the modern index. The dummy for the South is now insignificant, but the other variables retain the same signs as in estimation (1) and are highly statistically significant. In particular, the modern index of civic community has a significant direct effect on output, in addition to its indirect effect through the support of capital investment.

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[21] The exceptions to this pattern were that old associations had a negative effect on investment in the North but a positive effect in the South; preference voting had a beneficial effect on investment in the South but not in the North; and electoral turnout was insignificant in the South.

Given the negative relationship between associational density and capital investment, estimation (3) presents results taking associational density as the measure of social capital. The two-stage least squares results indicate that associational density has a significant direct positive effect on output, although density's indirect effect on output through its effects of capital investment are negative. When this estimation was repeated for the North and South of the country separately, results were similar to those reported in Tables 7 and 8, where capital investment was treated as exogenous: associational density's *direct* effect on output is negative in the North but positive in the South, although the *indirect* effect (through capital investment) is negative in both parts of the country.

Estimation (4) takes as instruments the standard deviation of value added as well as all of the individual measures of social capital. It also includes the two index measures of social capital as explanatory variables. Again, the results indicate that the measures of social capital have a positive direct effect on output as well as a positive indirect effect through enhanced capital investment. I also repeated estimation (4) for the North and South separately; the modern index of social capital was significant and positive in both parts of the country, but the traditional index was insignificant in both parts.

Total Factor Productivity and Social Capital

The results presented thus far are static: they examine how social capital affects economic output at a given time. In order to study the effect of social capital on dynamic changes in productivity, another approach is necessary. Instead of pooling the regions, as in the preceding results, I ran separate regressions for each region, taking as independent variables only capital, labor, and time. The coefficient on time then provides a measure of dynamic total factor

productivity improvement. The mean annual rate of improvement was 2.11%, with a standard deviation of 0.289%, a minimum of 1.63% (Piemonte) and a maximum of 2.65% (Puglia). A full listing of the rates of productivity growth in each region, with the regions ranked from highest to lowest, is presented in Table 11.

One striking thing about these results is that for the most part, the fastest growing regions are in the South, not the North. This is consistent with recent empirical work that finds a tendency toward convergence in economic growth rates across nations that have reached at least a minimum threshold of development.[22] Helliwell and Putnam (1995) caution about accepting the convergence hypothesis for the case of the Italian regions, since they find per capita income levels diverged between 1984 and 1990, after more than 20 years of convergence.[23] To assess this concern, I examined the standard deviation of value added per capita over my sample from 1970 to 1995. Like Helliwell and Putnam, I found convergence up until 1983, and divergence (increasing standard deviations) from 1984 through 1990. After 1990, however, the trend reversed itself once again, with a particularly sharp reduction in 1991.[24] Given this pattern, I have opted to eschew detailed analysis of the time pattern of convergence and divergence, and to focus instead on the broad trend across the sample period.

The unconditional relationship between productivity growth over the sample period and social capital is presented in Table 12. Simple correlations are presented for each of the social capital measures. Productivity growth is negatively associated with every single one of Putnam's measures of social capital. Furthermore, the degree of correlation is remarkably high in many

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[22] For further details, see Dowrick and Gemmell (1991) and Helliwell (1996).

[23] They hypothesize that the increased power granted to regional governments in 1980 may have been responsible for this reversal.

[24] As an illustration of this pattern, the standard deviations were .152 in 1970, .115 in 1975, .115 in 1980, .120 in 1985, .134 in 1990, and .124 in 1995.

cases. These correlations are consistent with Olson's (1982) theory that the proliferation of interest groups hinders innovation. They are also consistent with the work of Inglehart (1994b), who found a negative partial correlation between social capital and growth in a set of developed countries, and Helliwell (1996), who found a negative partial correlation between social capital and growth for seventeen OECD countries.

To probe this relationship further, I regressed the regional growth rates on the regional level of value added per capita in 1970, a dummy variable for the South, and various measures of social capital. If the convergence hypothesis is correct, regions with low levels of value added per capita in 1970 should grow faster than other regions, gradually catching up to their more developed brethren. Similar logic suggests that regions in the South are likely to grow faster than those in the North. Following the work of Dowrick and Gemmell (1991), who study a sample of countries ranging from rich to poor over the period 1960-1985, I also tried several measures of agricultural productivity in 1970, on the hypothesis that regions with large and/or relatively unproductive agricultural sectors may be further from the production frontier, and may thus have the ability to grow faster than other regions. The results are reported in Table 13.

As predicted by the convergence hypothesis, regions with low initial levels of value added per capita grew significantly faster during the period 1970-1995, a result that is robust across estimations (1) - (4). Also as predicted, all four estimations that include the dummy variable for the South find that the South grew significantly faster than the North during the sample period. I ran a variety of regressions for North and South separately, but these were hampered by the very small number of observations for each region, and most social capital measures proved insignificant. Preference voting and the existence of mass political parties were the most powerful social capital measures in these estimations. Estimations (5) and (6), for the North and South separately, show

results using the mass political parties measure; as in estimations (1) - (4), initial levels of value added per capita are negatively associated with future growth, with coefficients similar to those in estimations (1) - (4) , but in estimations (5) and (6) the effect is not significant at the 10% level.

The variables measuring agricultural productivity in 1970 generally proved thoroughly insignificant. I report one of these results in estimation (4), using a measure of real value added per employee in the agriculture sector in 1970, without significant results. Experimenting with various combinations of agricultural productivity (including the ratio of employees in industry to employees in agriculture and the ratio of industrial value added to agricultural value added) and social capital failed to yield any consistent significant results for the agricultural variables.

Contrary to the earlier work of Inglehart (1994b) and Helliwell (1996), the social capital measures are consistently positive, indicating that social capital helped rather than harmed productivity growth. While the coefficients are generally not significant at the 10% level, these results are important nevertheless, since they imply rejection of Olson's (1982) hypothesis that associational membership causes growth rates to decline. The pattern of these results on total factor productivity growth is similar to that found by Knack and Keefer (1997), although one of their estimations produced a negative relationship between social capital and TFP growth and only one of the estimations with a positive coefficient achieved a t-statistic greater than 1.0. The results for the Italian regions, then, suggest a somewhat stronger relationship between social capital and TFP growth than found by Knack and Keefer (1997).

It is important to distinguish these results from those of Helliwell and Putnam (1995), who also studied the twenty Italian regions. They found that growth in GDP per capita from 1950-1990 was positively associated with social capital. Because these authors did not have measures of capital investment on a regional basis, their findings confound the effects of capital accumulation

and technological improvement, and thus may be driven by the positive effect of social capital on

capital investment that was demonstrated above in Table 9. The results in Table 13, however, have

already stripped out the effects of capital investment, and focus directly on how social capital

affects the rate of innovation. To my knowledge, this is the first paper to find a positive and

significant relationship between social capital and rates of total factor productivity growth.

The contrast between my results and those for broader groups of countries raises some

interesting issues. Is Italian social capital "special" in some sense, allowing it to avoid the

negative effects identified in other papers? Does the process of aggregating social capital data to

the national, rather than regional, level cause the difference in the results? Further work that makes

use of both inter-regional and international data is needed to answer such questions.

6. Conclusions

Using data from the 20 Italian regions, I find that social capital supports economic

productivity through three channels: 1) increasing static production possibilities, 2) increasing

capital investment, and 3) increasing dynamic growth in total factor productivity.

Quantitative measures of social capital, when included in a regional production function,

generally have positive and significant impacts on economic value added. The measures with

greatest explanatory power are Putnam's composite index of modern social capital, newspaper

readership, the historical formation of cooperatives from 1889-1915, and electoral turnout from

1919-1921. Even for these variables, however, the magnitude of the effect on productivity is

relatively modest. Typically an increase of one standard deviation in the level of social capital

raises value added by around 10%. While this is hardly trivial, it does not approach the

importance of the familiar economic inputs of capital and labor. An increase of one standard

deviation in capital assets would raise value added by roughly 32%, while a one standard deviation in labor employed would raise value added by about 66%. Social capital appears to be a significant, but not dominant, input.

Social capital does not appear to be just a proxy for the broad set of differences that separate the North and South of the country into "two Italies." Even after controlling for location in the North or South, the measures of social capital provide significant explanatory power within each of these parts of the country, although their power is substantially less than when applied to the country as a whole. Interestingly, and consistent with Olson's (1982) view that interest group proliferation dampens the growth of developed economies, the majority of social capital variables (including associational density, as Olson would predict) have negative coefficients in the North, while the opposite is true in the South.

A second means through which social capital affects economic output is through its effects on capital investment. Both Putnam's modern index of civicness and his index of civic traditions are significantly positively associated with higher investment. The strongest relationship, somewhat surprisingly, is between the formation of mass political parties in the early part of the 20th century and recent capital investment. Variance in industry sectoral composition has a significant negative impact on investment, yet has little direct impact on industry value added; it thus makes a good instrument for capital investment. Instrumental variable estimates taking capital investment as endogenous indicate that most measures of social capital contribute to economic productivity both directly as a factor of production and indirectly through supporting more investment.

The most striking "dark side" to social capital in this analysis appears in the effects of associational density on capital investment. In both the North and South of Italy, dense networks of

association have a negative and significant relationship to capital investment. Estimations using variance in value added as an instrument for capital investment find that association density has a positive direct effect on output in the South but a negative direct effect in the North. For this form of social capital, then, Olson's (1982) view receives significant support here.

The third channel through which social capital may matter is by affecting growth in total factor productivity. Simple correlations show that rates of productivity growth are negatively correlated with every social capital variable examined here. This appears at first glance to support Olson's (1982) theory that the proliferation of associational groups chokes off innovation. The literature on convergence of growth rates across countries, however, suggests the correlation may be spurious: less-developed regions tend to grow faster than developed ones, as they borrow ideas and techniques from the latter, and they also tend to have low levels of social capital, but this does not mean low levels of social capital improve growth. Regression analysis that controls for both a region's initial level output level per capita, and its level of social capital, finds that low-output regions do indeed tend to grow faster, but once this effect is controlled for, social capital has a positive (if usually insignificant) rather than a negative effect on productivity growth.

While the results obtained here are quite fascinating, they raise a number of questions. Several of the social capital variables produce results that are contrary to expectations (at least in certain combinations) or unstable across different specifications. Further research is needed to determine whether this is due to limitations in the data or to underlying theoretical factors that have yet to be clearly identified. In addition, the results on social capital and total factor productivity growth stand in contrast to those found in cross-country comparisons, raising interesting questions about how inter-regional comparisons can be squared with international ones.

Table 1: Summary Statistics

Variable	Obs.	Mean	Std. Deviation	Minimum	Maximum
Value Added	520	51484.26.8	49260.39	2053.15	270183.6
Investment	520	11333.85	9605.22	623.76	51044.42
Employment (000)	520	1094.368	902.04	52.5	4057.2
Referendum Turnout 1974-1987	520	-.0005	.975	-1.93	1.4
Preference Voting 1953-1979	520	.0065	.9498	-1.58	1.2
News Readership (%) 1975	520	62.75	13.05	35	80
Assn. Density 1981	520	0	.9757	-2.19	1.3
Mass Parties 1919-21	442	-.0147	.9767	-1.5	1.33
Cooperatives 1889-1915	442	-.00118	.9703	-1.11	2.34
Mutual Aid Societies 1873-1904	442	-.0441	1.0437	-1.84	1.86
Electoral Turnout 1919-1921	494	.15	1.0758	-1.87	2.26
Old Associations founded before 1860 (%)	520	.578	.6759	0	3.13
Community Index 1953-1987	520	0	.9757	-1.64	1.08
Tradition Index 1860-1920	442	-.0682	.9104	-1.33	1.45

Table 2: Correlation of Social Capital Measures

	COM	REF	PREF	NEWS	ASSOC	TRAD	MASS	COOP	MUT	ELEC	OLD
COM	*1.00*										
REF	*.96*	1.00									
PREF	*.95*	.91	1.00								
NEWS	*.88*	.79	.75	1.00							
ASSOC	*.89*	.79	.81	.69	1.00						
TRAD	.93	.90	.91	.85	.73	*1.00*					
MASS	.91	.90	.91	.81	.70	*.97*	1.00				
COOP	.85	.80	.84	.81	.65	*.93*	.90	1.00			
MUT	.86	.82	.80	.80	.74	*.91*	.88	.76	1.00		
ELEC	.69	.70	.74	.62	.44	*.78*	.71	.68	.61	1.00	
OLD	.58	.56	.50	.42	.66	*.56*	.54	.49	.46	.24	1.00

Table 3: Determinants of Growth in Output Per Capita
(Dep. Variable is Ln VA/Capita 1995 - Ln VA/Capita 1970)

Indep Variable	(1)	(2)	(3)	(4)
Ln VA/Capita 1970	-.6208*** (-4.770)	-.5944*** (-5.090)	-.5649*** (-4.948)	-.7512*** (-5.919)
Commun	.0615*** (3.105)			.0685*** (3.865)
Trad		.0686*** (3.425)		
Mass			.0598*** (3.275)	
Avg Annual Investment				3.38×10^{-6}** (2.414)
Constant	2.7209*** (5.986)	2.6297*** (6.451)	2.5233*** (6.343)	3.1377*** (7.185)
Adjusted R^2	.5267	.6020	.5858	.6314
Observations	20	17	17	20

t-statistics in parentheses
*   = Significant at the 10% level
**   = Significant at the 5% level
*** = Significant at the 1% level

Table 4: Determinants of Economic Output
(Dependent Variable: Ln Value Added)

Indep. Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ln Capital	.2787*** (10.209)	.2147*** (13.670)	.2505*** (13.583)	.1919*** (11.709)	.1367*** (9.409)	.2537*** (13.538)	.1051*** (6.615)
Ln Employment	.7960*** (31.853)	.8398*** (58.627)	.7924*** (44.190)	.8824*** (52.398)	.8992*** (67.488)	.7882*** (43.041)	.9674*** (50.266)
Period	.0188*** (30.297)	.0191*** (53.938)	.0195*** (48.184)	.0194*** (56.102)	.0195*** (64.462)	.0195*** (49.124)	.0195*** (66.984)
Community Index 1953-1987		.0900*** (32.700)		.1128*** (12.804)			
Tradition Index 1860-1920			.1025*** (24.361)	-.0330*** (-2.955)			
Referendum Turnout 1974-87					-.0019 (-.288)		-.0016 (-.257)
Preference Voting 1953-1979					.0311*** (4.957)		.0159* (1.666)
News Readership 1975					.0061*** (16.135)		.0048*** (9.921)
Assn. Density 1981					-.0143** (-2.304)		.0649*** (5.897)
Mass Parties 1919-21						.0175* (1.654)	-.0187 (-1.492)
Cooperatives 1889-1915						.0541*** (7.522)	.0148*** (2.528)
Mutual Aid Soc. 1873-1904						.0227*** (3.805)	-.0358** (-6.052)
Electoral Turnout 1919-1921						.0077 (1.600)	.0106*** (2.568)
Old Associations pre-1860					.0272*** (6.466)	.0069 (.680)	-.0489*** (-4.235)
Constant	2.367*** (27.192)	2.648*** (52.532)	2.632*** (45.455)	2.565*** (51.599)	2.554*** (58.631)	2.623*** (44.488)	2.5085*** (52.023)
Adjusted R^2	.9909	.9970	.9959	.9970	.9979	.9961	.9980
Observations	520	520	442	442	520	442	442

t-statistics in parentheses

*　 = Significant at the 10% level
** 　= Significant at the 5% level
*** = Significant at the 1% level

Table 5: Northern vs. Southern Italy

Variable	Mean: North	Mean: South
Value Added	60352.17	40645.71
Investment	12566.62	9827.14
Employment (000)	1224.17	935.71
Cooperatives 1889-1915	.789	-.703
Mutual Aid Societies 1873-1904	.878	-.863
Community Index 1953-1987	.793	-.969
Tradition Index 1860-1920	.780	-.822

Table 6: Output with Southern Dummy Variable
(Dependent Variable: Ln Value Added)

Indep. Variable	(1)	(2)	(3)
Ln Capital	.2829*** (13.986)	.1469*** (9.710)	.1049*** (6.980)
Ln Employment	.7871*** (42.496)	.9087*** (59.987)	.9369*** (50.097)
Period	.0188*** (40.923)	.0196*** (63.613)	.0197*** (71.147)
South Dummy	-.1416*** (-20.614)	.1291*** (10.861)	.1226*** (7.153)
Community Index 1953-1987		.1331*** (16.553)	
Tradition Index 1860-1920		.0177 (1.617)	
Referendum Turnout 1974-87			-.0030 (-.519)
Preference Voting 1953-1979			.0440*** (4.465)
News Readership 1975			.0050*** (10.887)
Assn. Density 1981			.0398*** (3.622)
Mass Parties 1919-21			.0410*** (2.834)
Cooperatives 1889-1915			.0009 (.157)
Mutual Aid Soc. 1873-1904			-.0168*** (-2.713)
Electoral Turnout 1919-1921			.0045 (1.134)
Old Associations pre-1860			-.0290*** (-2.573)
Adjusted R^2	.9950	.9977	.9982
Observations	520	442	442

t-statistics in parentheses
*   = Significant at the 10% level
**   = Significant at the 5% level
*** = Significant at the 1% level

Table 7: Output in Northern Italy
(Dependent Variable: Ln Value Added)

Indep. Variable	(1)	(2)	(3)	(4)
Ln Capital	.2634*** (11.619)	.2753*** (12.925)	.1253*** (8.124)	.2074*** (10.263)
Ln Employment	.7902*** (38.693)	.7868*** (31.982)	.8470*** (58.978)	.9903*** (31.798)
Period	.0185*** (37.729)	.0192*** (50.503)	.0199*** (65.133)	.0188*** (56.108)
Community Index 1953-1987		.3248*** (7.773)		
Tradition Index 1860-1920		-.0586** (-2.274)		
Referendum Turnout 1974-87			.0146 (1.260)	
Preference Voting 1953-1979			-.0133 (-.611)	
News Readership 1975			.0100*** (12.008)	
Assn. Density 1981			-.2122*** (-13.512)	
Mass Parties 1919-21				-.4600*** (-9.054)
Cooperatives 1889-1915				.0951*** (14.464)
Mutual Aid Soc. 1873-1904				-.0548*** (-7.038)
Electoral Turnout 1919-1921				.0249*** (6.224)
Old Associations pre-1860				-.0435*** (-3.678)
Constant	2.6111*** (36.514)	2.3028*** (27.890)	2.8973*** (39.167)	2.1264*** (20.243)
Adjusted R^2	.9974	.9976	.9990	.9983
Observations	286	208	286	208

t-statistics in parentheses   ** = Significant at the 5% level
* = Significant at the 10% level   *** = Significant at the 1% level

Table 8: Output in Southern Italy
(Dependent Variable: Ln Value Added)

Indep. Variable	(1)	(2)	(3)	(4)
Ln Capital	.2901*** (8.663)	.0863*** (4.352)	.1164*** (6.031)	.2155*** (9.420)
Ln Employment	.8056*** (25.597)	.9708*** (49.935)	.9823*** (59.141)	.8790*** (34.410)
Period	.0194*** (24.195)	.0193*** (46.521)	.0191*** (50.145)	.0193*** (36.258)
Community Index 1953-1987		.1339*** (13.754)		
Tradition Index 1860-1920		.0215 (1.392)		
Referendum Turnout 1974-87			.0224** (2.419)	
Preference Voting 1953-1979			.1268*** (9.591)	
News Readership 1975			.0005 (.747)	
Assn. Density 1981			.0360*** (5.912)	
Mass Parties 1919-21				-.1363*** (-2.663)
Cooperatives 1889-1915				.2895*** (5.863)
Mutual Aid Soc. 1873-1904				-.1168*** (-3.926)
Electoral Turnout 1919-1921				.1070*** (6.026)
Old Associations pre-1860				.1330*** (5.765)
Constant	2.1185*** (19.772)	3.004*** (45.023)	2.665*** (42.968)	2.3215*** (15.925)
Adjusted R^2	.9918	.9978	.9982	.9965
Observations	234	234	234	234

t-statistics in parentheses   ** = Significant at the 5% level
* = Significant at the 10% level   *** = Significant at the 1% level

Table 9: Investment and Social Capital
(OLS Estimates--Dependent Variable is Ln of Real Capital Investment)

Indep. Variable	(1)	(2)	(3)	(4)	(5)
Period	.0405*** (7.591)	.0123*** (2.751)	.0458*** (10.024)	.0374*** (7.194)	.0162*** (4.440)
South Dummy	1.3643*** (8.258)	1.7200*** (13.145)	1.6017*** (15.781)	-.3244** (-2.322)	2.5300*** (21.070)
Std. Dev of VA	-4.040*** (-12.266)	-.7302** (-2.171)	-4.7019*** (-16.742)	-3.635*** (-11.171)	-1.2459*** (-4.557)
Commun	.4646*** (5.614)				
Trad		1.3010*** (20.360)			
News			.05039*** (15.250)		
Assoc				-.5055*** (-8.292)	
Mass					1.5722*** (28.915)
Constant	12.0041*** (38.913)	8.8972*** (30.536)	9.3539*** (28.647)	12.3852*** (43.772)	8.8825*** (37.630)
Adjusted R^2	.2838	.5429	.4764	.3295	.6943
Observations	520	442	520	520	442

t-statistics in parentheses
*   = Significant at the 10% level
**   = Significant at the 5% level
*** = Significant at the 1% level

Table 10: Output and Social Capital with Endogenous Investment
(Dep. Variable is Ln Real Value Added)

Indep. Variable	(1) OLS	(2) 2SLS Instrument: Std Dev of VA	(3) 2SLS Instrument: Std Dev of VA	(4) 2SLS Multiple Instruments
Ln Real Investment	.1474*** (9.704)	.6414*** (3.143)	.6093*** (2.878)	.3389*** (8.651)
Ln Employment	.9085*** (59.857)	.4574*** (2.520)	.5054*** (2.595)	.7242*** (19.076)
Period	.0195*** (51.659)	.0176*** (19.179)	.0176*** (19.447)	.0193*** (53.242)
South Dummy	.1268*** (9.585)	-.0104 (-.212)	-.0634** (-2.064)	.0883*** (5.587)
Std Dev of VA	.0114 (.404)			
Commun	.1332*** (16.541)	.0758*** (2.772)		.1000**** (8.937)
Trad	.0177 (1.610)			.0363*** (2.737)
Association Density			.0488*** (2.738)	
Constant	2.7208*** (49.394)	1.3677** (2.264)	1.363** (2.292)	2.2526*** (21.843)
Adjusted R^2	.9977	.9928	.9930	.9968
Observations	442	520	520	442

t-statistics in parentheses
*   = Significant at the 10% level
**   = Significant at the 5% level
*** = Significant at the 1% level

Table 11: Rates of Productivity Improvement over Time

Region	North/South	Growth Rate
Puglia	South	2.648%
Molise	South	2.592%
Friuli	North	2.512%
Abruzzi	South	2.405%
Sicily	South	2.334%
Veneto	North	2.330%
Sardegna	South	2.174%
Campania	South	2.158%
Lazio	South	2.155%
Calabria	South	2.076%
Marche	North	2.066%
Lombardy	North	2.064%
Tuscany	North	2.007%
Val d'Aosta	North	1.957%
Emilia-Romagna	North	1.949%
Basilicata	South	1.894%
Liguria	North	1.824%
Trentino	North	1.819%
Umbria	North	1.658%
Piedmont	North	1.628%

Table 12: Correlation between Productivity Growth and Social Capital

Social Capital Measure	Correlation with Productivity Growth
Community Index 1953-1987	-.4779
Tradition Index 1860-1920	-.5406
Referendum Turnout 1974-87	-.3857
Preference Voting 1953-1979	-.3637
News Readership 1975	-.4827
Assn. Scarcity 1981	-.5328
Mass Parties 1919-21	-.4690
Cooperatives 1889-1915	-.4634
Mutual Aid Societies 1873-1904	-.6627
Electoral Turnout 1919-1921	-.3874
Old Associations pre-1860	-.1719

Table 13: Total Factor Productivity Growth and Social Capital
(Dep. Variable is Rate of Productivity Growth from 1970-1995)

Indep Variable	(1)	(2)	(3)	(4)	(5) North	(6) South
VA/Capita 1970	-.0003** (-2.203)	-.0002** (-2.113)	-.0004** (-2.571)	-.0004** (-2.358)	-.0003 (-1.064)	-.0004 (-1.620)
South Dummy	.0041*** (3.114)	.0043** (2.204)	.0079*** (3.515)	.0069** (2.174)		
Commun	.0014 (1.667)					
Trad		.0014 (1.172)				
Mass			.0037** (2.456)	.0029 (1.333)	.0042 (1.734)	.0037 (1.332)
Ag VA per Capita 1970				.0002 (.608)		
Constant	.0277*** (7.005)	.0266*** (7.566)	.0291*** (7.181)	.0289*** (5.977)	.0248** (2.938)	.0383*** (3.946)
Adjusted R^2	.2093	.2874	.4612	.4338	.1654	.3046
Observations	20	20	17	17	8	9

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(lxxiv) This paper was presented at the ENGIME Workshop on "Trust and social capital in multicultural cities" Athens, January 19-20, 2004