Measuring Social Capital:

Culture as an Explanation of Italy's Economic Dualism

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ABSTRACT

The paper presents a quantitative test of the oft-repeated view that Italy's backward and poor South suffered from low "social capital", a tendency to defect from co-operative engagements. The problem with such assertions is that they run the risk of taking as evidence in favour of the hypothesis the very observations that need to be explained. The analysis carried out in this work tries to break out of this impasse by analysing the conditions under which it was *ex ante* welfare-improving for farmers in early 20th century Italy to join an unlimited liability rural co-operative bank which would give them access to cheaper credit but also exposed them to the risk of their neighbours' defection. These co-ops are a prime testing ground for the cultural explanation in that they spread rapidly throughout Northern Italy in the late 19th century, but never gained a similar popularity in the South. I estimate the switching function for these co-ops in different parts of the country to test whether Northern and Southern farmers faced significantly different choice sets when making the decision to join. Identical choice sets but differential responses would of course favour the cultural explanation of the South's backwardness. The results suggest that for the same parameter values, the choice sets for North and South were different, though whether this difference was large enough to explain the full difference in responses is not completely clear.

Economists have increasingly recognised that high social capital, understood as sustained group-level co-operative behaviour, constitutes an essential lubricant to economic and political systems (Arrow 1972; Coleman 1990; Glaeser, Laibson, Scheinkman and Soutter 1999 for review). In particular, Dasgupta (1988) has argued that the foundation of social capital, trust, depends on credible sanctions and correct incentives. Since observable behaviour may be motivated by opportunism or strategic considerations, trust derives from knowledge of others' awareness that future benefits depend upon current honesty, or on efficient enforcement mechanisms. Social capital is thus cumulative and shares some the characteristics of public goods, in that it has extensive externalities and does not diminish with use -- in fact, it may increase. In addition, trust implies unobservability in a complex world. Unobservability and complexity mean that individuals routinely come into contact with others about whom they have limited or no information but whose co-operation must be engaged. Reliance on third-party enforcement may play a role, but it hardly needs stressing that enlisting this help is not costless. It follows that besides being cumulative, social capital is also general, meaning that for it to work effectively (that is, to solve multiple prisoner's dilemmas), there has to be a 'culture of trust'. This expression may sound disturbingly woolly, so it has to be given analytical incisiveness. A culture of trust exists when the overwhelming majority of players expect that, in the overwhelming majority of transactions, other parties whose behaviour cannot be fully monitored will not defect, that is, will not seek to seize a greater-than-agreed share of the cumulative benefits. A culture of trust is a systemic bias in favour of co-operative resolutions to multiple prisoner's dilemmas.

Low social capital is often blamed for economic backwardness, as is witnessed by the stress currently laid by international development agencies on fighting corruption. In this view, a culture of trust is an essential component of what Abramovitz (1986) has called the “social capability” underlying convergence. The point is intuitively appealing, since it seems reasonable that productive investment, which involves trading current claims upon resources for future claims contingent upon third party behaviour, will be discouraged where income streams are insecure. The work of Mauro (1995) provides empirical verification for this view Arguing in this vein, then, Putnam (1993), drawing on earlier work by Banfield (1958), has suggested that Italy’s underdeveloped South was plagued by a lack of ‘civil culture’. The argument, supported in part by A’Hearn (forthcoming), is that Southern Italians never overcame their reciprocal mistrust in order to produce networks of mutual engagement, so that incentives to defect were never reduced by social sanctions. The equilibrium was

disastrous but stable, in that the dominant strategy was to avoid engagement outside narrowly restricted circles where effective sanctions and reciprocity operated, that is, in practice, within the family (Sinisi 1989; Basu 1995). "When your neighbour's house is on fire," admonishes a Southern Italian proverb, "bring water to your own." One consequence of this may have been the very backwardness of the area: in the early 20th century, the South's per capita output was barely 3/4 of the national average and its personal income one half of the industrial North's (Zamagni 1993, 39). Literacy, infant mortality, life expectancy, or any other index told the same story, and the situation is not too different today.

The approach is challenging, and this paper offers a test for the 'culture-of-trust' explanation of Southern backwardness. At this stage, proving that low trust hurt the South's development chances is not possible. I will instead focus on whether there is evidence of significantly different levels of trust in Northern and Southern Italy by calculating a measure of the trust Southern Italians had for one another using a form of revealed preferences approach. Specifically, I will model their decision to join a rural co-operative bank (*cassa rurale*) in the early years of the 20th century, a period when these banks were spreading rapidly in the rest of the country, though they remained few in the South. These banks, modelled on the Raiffeisen co-ops, are a prime testing ground for any claim about social capital because members accepted, by law, unlimited liability for the co-op's debts. Indeed, low social capital is central to Guinnane's (1994) account of why these institutions failed in Ireland. Against the benefit of borrowing at lower rates than those of the village moneylender ('formal' banks were noticeable for their absence from Italy's rural areas before the interwar years: Muzzioli 1984), farmers had to weigh the possibility of being ruined by their neighbours' defections. By and large, Northern Italians felt this was a gamble worth taking, and joined. Southerners did not. How much more 'trust' in their neighbours would Southerners have needed to behave as their Northern cousins? Or were there other constraints that dictated their different response to these banks?

In the next Section I will sketch a brief history of rural co-operative lenders in Italy, and set the stage for the test presented later in the paper. Section II will introduce a simple framework to model 'trust' in this context, and Section III will use official data to compare the revealed degrees of trust farmers in Northern and Southern Italy felt for their neighbours.

Section I: Rural credit co-operatives in Italy, 1883-1926

The salient facts relating to rural co-operative credit in Italy are easily stated. The first (non-denominational) *cassa rurale* was founded in June 1883 near Padua with a membership of 14. By December 1899 over 6,000 farmers had joined similar co-ops, and loans financed by these banks had grown in real terms by more than 2,800 % (Agostini 1985, 133; Zalin 1985, 37). In the 1890s, a number of Catholic credit co-ops were also started thanks to the initiative of parish priests encouraged by the Vatican's relaxation of its previous rejection of anything smacking of modernity and social activism following the encyclical *Rerum Novarum* in 1891 (Preziosi 1985). The capillary organization of the Church helped in the diffusion of these experiments, and only seven years after the founding of the first Catholic *cassa* (August 1892), Catholic co-operatives in Italy numbered almost 800 and loans financed by them went from less than 40,000 *lire* per year to over 10,000,000 (Cooperazione 4.11.1894, 44; Tramontin 1974; Tamagnini 1952, 101). While no census of co-ops was ever taken before the interwar years, it appears that by December 1916, some 2100 *casse rurali* existed in Italy, with a total membership of 115,000 (Tamagnini 1952, 105).. The evidence, limited though it is, also strongly suggests that rapid growth was not bought at the expense of solvency: few *casse* ever failed and borrowers seldom defaulted (Tamagnini 1952, 100; Bresolin 1980, 138)

This success is all the more remarkable because there were good reasons to expect that few people would join. Legally, a credit co-operative was constituted when no less than three individuals signed the articles of incorporation, the main feature of which was that members were "jointly and severally responsible with all their property" for the co-op's liabilities. Co-operatives raised funds either by accepting deposits from the public, or by obtaining backing from larger financial institutions in the form of a loan note secured on the property of members. Lending was almost exclusively short term (1 year) and was restricted to members. In addition, shares were not tradable, no dividends could be distributed, and each member only had one vote regardless of the number of shares held. Finally, the co-op required a commitment of time and effort, which by law could not be remunerated.

In spite of the risks and drawbacks associated with these legal requirements, the co-ops soon attracted a large membership. While the backgrounds of members have not yet been analysed in detail, some data from the late 1890s give the following cross section: in 1898, 57.7% of co-op members were small landowners; 29.2% fixed rent tenants or sharecroppers; 9.1% artisans, shopkeepers or small merchants; 4% farm hands. In the same

year, 30.4% of co-op loans by value were used to buy livestock; 19.1% financed trade or small scale manufacturing; 16.3% were used to purchase fertilisers, herbicides, or fungicides: 13.3% went into land improvement; 11.8% to buy food; 6.1% to buy fodder; 1.7% financed seasonal migrants; and 1.3% to buy farm tools (Caputo 1989, 28-9).

These data are interesting, if vague. It is not clear, for example, what is meant by "small landowner", or "small scale manufacturing", yet the flavour of the information points definitely to localised micro credit. This is confirmed by one of the few instances of recorded collateral accepted by a *cassa*, that in Treviglio (40 km east of Milan). From 29 March to 12 September 1899, this co-op extended credit on the security of cattle (120 heads in 62 transactions), horses (12 in 10 transactions), donkeys (15 in 15 transactions), carts (3 in 3 transactions), and even a borrower's garlic crop (Treviglio 1899). At this level of micro-credit, the advantages offered by co-ops to small borrowers are well known and need not detain us here (Banerjee, Besley, and Guinnane 1994; Besley and Coate 1995; Besley, Coate, and Loury, 1993).

In general, the portfolio of the *casse* appears to have consisted mostly of loans, secured and unsecured, and deposits with larger banks. Only very occasionally did they invest in government or commercial paper: each of these accounted for less than 1% of assets in 1905 (Ruggieri 1964). Important regional differences existed, however, in their liabilities, which were mostly current and savings accounts in Northern Italy (less commonly term or time deposits), while they included a significant portion of loans from banks of issue in the South, particularly in Sicily (Sannucci 1990, Polsi 1996).

The *casse*'s local character was never compensated by a strong federal structure, unlike the Crédit Agricole in France or the Raiffeisen banks in Germany (Gueslin, 1984, Marschalk 1984).. At a reasonably early stage, inter-bank lending appeared as co-ops that had grown faster than others acted both as clearing houses and as providers of discount facilities (Bermond 1996, 15-6; Lanzavecchia 1986, 171; Ristorto 1971, 80). In most cases, however, the local savings banks, which were predominantly urban in character, acted in the secondary market for co-ops (Saguatti 1989, 234-54; Veneruso 1982, 575-6; Cafaro 1996, 96-7). While a number of federations of *casse rurali* were founded from the mid-1890s onward, they were almost always local affairs, at times consisting of no more than half a dozen co-ops. These organisations never became large enough to act as discounters or lenders of last resort for the *casse*, which, outside of a few privileged areas such as Sicily, did not have easy access to the banks of issue for liquidity. Several national conventions

resolved set up a nation-wide bank to provide better rediscount and secondary market facilities, but in practice fewer than 20 % of existing *casse* ever bothered to join (Cafaro 1985, 53-72). In fact, the *casse* were either actively opposed to, or at least suspicious of, wider networks, often precisely because their strong local character made them uneasy with organisations based in other parts of the country (Cooperazione 25.10.1914; Pessina 1987, 294-5; Di Taranto 1996, 512; Lo Giudice 1996 572-3). This disintegrated structure and the extreme reliance of the co-ops on the local economy did not cause important liquidity problems in the years before the First World War. The 1907 financial crisis did bring about a decline in the number of co-ops, but only because some failed as a result of losses suffered when larger financial institutions closed their doors (Bonelli 1971). In any event, the loss in numbers was reasonably quickly made up. However, except for 1907, when their financial support simply vanished, failures were rare among co-ops (Cafaro 1985, 34), and those that did occur appear to be related to individual mismanagement or, more rarely, fraud (Pretelli 1990). The inflationary experience of the war years changed this situation dramatically.

The fragmented structure of co-operative credit in post-First World War Italy meant that as a rule co-ops used a few larger intermediaries (at times only one) as providers of rediscount facilities or as placement for excess liquidity. Wartime inflation and rationing from 1915 onward brought about a rapid rise in the *casse*'s liabilities, the proceeds from which were often simply placed on term with larger local banks with which co-ops already had long-standing relationships. In fact, what the co-ops lacked was a diversified investment strategy, which left them open to important, often critical, losses when the larger institutions found themselves in difficulties in the post war deflation (Zamagni 1993, 217; Caroleo 1986). The early 1920s saw a sharp decline in the number of *casse*, partially masked in the official data by the high number of co-ops located in the territories gained by Italy with the Treaty of Versailles (Cafaro 1996, 86, Leonardi 1996; Bof 1996).

The financial difficulties of many *casse* in the early to mid-1920s gave the Fascist régime the excuse to intervene, bringing them under direct supervision by the Ministry of Finance and the central bank, forcing a number of mergers, and setting up a federal structure. The *casse* were thereby removed from the influence of the Catholic clergy and brought under the control of the Fascist party (Caputo 1989, 47-53; Caroleo 1986; Roggi 1982, 34-5). From that point on the *casse* lost their purely rural character, as a number of legislative measures merged them with urban co-operative and mutual aid societies, forming larger bodies whose operations were still geographically restricted, though on a somewhat wider scale than before.

The effect of these reforms was to reduce the number of banking co-operatives. The 1930s depression, though less acute in Italy than elsewhere (Mattesini and Quintieri 1997), further weakened their position. The 2263 casse active in 1926 had by 1937 declined to 1748 (-22.8%), while total liabilities fell by 43.4% in the same period, and the value of their portfolio declined by over 2/3 (Caputo 1989, 53). In fact, it was only with the Italian "economic miracle" in the 1950s that co-operative banks experienced renewed growth (Gigliobianco 1996).

If these were the broad national trends, regionally the co-ops underwent widely varied experiences. In Northern Italy (the 30 provinces[1] constituting the regions of Piedmont, Liguria, Lombardy, Venetia, Emilia) their growth was extremely rapid, and the area came to have a disproportionate number of *casse*. The only region outside of the North where co-ops were common was Sicily which, with 9% of Italy's farm labour force, accounted for 17.6% of credit co-ops in 1910. Excluding Northern Italy and the anomaly of Sicily, the rest of the country had fully half the farm labour force but fewer than 20% of all co-operative lenders, and only 13.3% of their assets (Caputo 1989, 38; Galassi and Cohen 1994, 594). The *casse* thus mirrored the North-South gradient that characterises the Italian economy.

Sicily had a high concentration of rural co-op lenders, which made it an anomaly in the North-South gap. The Bank of Sicily, which was a bank of issue, subsidised co-operative banks in rural areas by assisting in setting them up and extending credit over the years (Lorenzoni 1909, La Loggia 1914; 708ff; Lo Giudice 1966; Muzzioli 1983, 175-8). In most cases, however, these co-ops remained dependent on loans from the bank of issue for capital, and only a few developed into active financial intermediaries of their own (Lo Giudice 1966).

The following table reports summary statistics to illustrate the situation at the end of 1910 (the choice of year is determined by the availability data from the agricultural census of 1911: see Cohen and Galassi 1990, and. Galassi 1999). Part of the issue here is how to define North and South. I am including in the Centre-South some regions that are traditionally seen as closer to Northern levels, such as Tuscany, exclusively because they also had very few co-ops.

[1] A province in Italy is an administrative subdivision corresponding to the British county. Regions were, at the time, made up by a number of provinces varying between 1 and 8.

Table 1: Summary Statistics of Rural Co-operative Banks in Italy on 31 December 1910, by Region, Weighted Averages of Provincial Means.

Areas	Rural Co-op Banks per 100,000 Farm Workers	Rural Co-op Assets per Farm Worker (current *lire*)	Assets per Rural Co-op Bank (current *lire*)	Rural Co-op Assets per 1,000 *lire* of Savings Bank Assets
North [a] (n=30)	24.3 (s.d.=24.04)	18.52 (s.d.=4.5)	71,410 (s.d.=66,395)	27.5 (s.d.=45.37)
Centre/South [b] (n=39)	6.8 (s.d.=7.38)	6.11 (s.d.=8.63)	43,972 (s.d.=66,364).	24.16 (s.d.=71.98).
Centre/South excluding Sicily (n=32)	5.61 (s.d.=6.52)	3.66 (s.d.=3.86)	37,660 (s.d.=50,722)	20.75 (s.d.=80.67).

Sources: MAIC 1911, 1912; Galassi and Cohen, 1994; Galassi, 1999.

(n): number of provinces.
(a) Regions: Piedmont, Liguria, Lombardy, Venetia, Emilia;
(b) Regions: Tuscany, Umbria, Latium, Marche, Campania, Abbruzzi, Apulia, Basilicata, Calabria, Sicily, and Sardinia.

The data show, first, that in the South farmers were less likely to join, and co-ops were smaller and poorer, than in Northern Italy. However, the gap varies. While Northern co-ops were on average 4.5 times more numerous and 5 times richer than Southern co-ops when standardised by the provincial labour force, they were only about twice as rich on a bank-by-bank basis. Secondly, while the means are significantly different in three of the four columns, in all columns Northern data are markedly more clustered than Southern data Finally, Northern co-ops do not seem markedly more adept at attracting savings deposits than Southern co-ops[2].

This raises the important question of whether the North-South differences in the first two columns of Table 1 (and to a smaller degree in the third) are really no more than a reflection of differing labour productivity in the two areas. Poorer workers save less and may need fewer deposit facilities. Are there reasons to believe that this is the source of the gap?

[2] The fourth column of the table does not include post office accounts, because there are methodological difficulties in these data as it makes little sense to compare bank assets with savings accounts, which is what the post office data report. A direct comparison of savings accounts in both banks and the post office is made impossible by the way in which the Ministry published the bank data, reporting different kinds of deposits together. However, it has to be noted that post office savings deposits were higher in Northern Italy than in the South, so that by excluding them I am in fact over-estimating the share of the savings market the co-ops had in

The answer is, no. As a crude but effective way of testing this, the correlation coefficient between co-op assets per worker, number of *casse*, and labour productivity in agriculture by province (Cohen and Galassi 1990 for methodology) is reported in Table 2.

Table 2: Correlation Coefficients between Provincial Output per Farm Worker and Numbers and Assets of Rural Co-operative Banks, in Italy, 1911.

Range	Correlation Coefficient between Number of Rural Co-operative Banks and Output per Farm Worker, by Province	Correlation Coefficient between Rural Co-operative Bank Assets and Output per Farm Worker, by Province
All of Italy (n=69)	0.091	-0.023
Italy exc. Sicily (n=62)	0.066	0.035

Sources: MAIC 1911, 1912; Cohen and Galassi 1990; Galassi and Cohen, 1994; Galassi, 1999.

When these coefficients are positive, they are also strikingly small. In one case, the relation is actually negative, though very weak. This is not surprising: rural co-ops were particularly common in North-eastern Italy, where output per worker was low (Cohen and Galassi 1990). In any event, there was evidently something other than the productivity gap at work.

One way to interpret these tables is that in the South there was a co-ordination failure in the initial set up of these co-ops: once a *cassa* was in operation and demonstrated its reliability, depositors came forth in the South as much as in the North. The stumbling block was finding people willing to sign the original incorporation and manage the co-op in the early stages of its existence. Is there other evidence to support this interpretation?

Some telling information does in fact exist. In the 1890s, a number of Catholic newspapers, observing the growing gap between the diffusion of rural co-ops in different areas, suggested setting up a number of "demonstration" co-ops in Southern Italy. Their incorporation would last for only one year, at the end of which the co-op would be dissolved and any assets distributed among members. It was hoped that this would convince people of the workability of the idea and so they would join "real" co-ops (Tosti 1996, 416). The idea

the North by a greater margin than elsewhere. The relative ability to attract savings of Southern co-ops is therefore *under*-represented.

was never tried in practice because of the high set up costs associated with incorporation[3], yet the very fact that the proposal was made at all is consistent with the interpretation of Tables 1 and 2.

Other evidence also confirms that the participation failure stemmed from the initial co-ordination problem. In 1897 the first Catholic *cassa* in Southern Italy completed its first year of operation. In their report, the managers thought the experience "highly satisfactory ... considering local conditions, [people being] still unfamiliar with the functioning of these institutions, still in the grip of mistrust, while at the same time [there is] a great fear after so many bankruptcies, so many frauds, suffered at the hands of dishonest folks" (Di Taranto 1996, 529)[4]. Elsewhere in the South, it was difficult to find people who both possessed the skills to manage an undertaking of this sort and at the same time enjoyed the trust of the community. In many areas it was believed that the managers of a co-op would run it for their personal advantage, either to enrich themselves and their families, or as a step to further a political career (Di Taranto 1996, 516-7; Rossi 1977, 332-3; Gallo 1996, 502-3).

Such suspicions just do not appear to have surfaced in the North. Does this difference reflect what Banfield (1958) called "amoral familism", the idea that the basic organisational criterion of the Italian South was loyalty to one's family, and Putnam (1993) has recently argued was a 'lack of civil culture' in Southern Italy? The co-ops would, in this perspective, be yet another victim of low social capital. Lacking credible mutual engagements, Southerners expected others to do defect. Given the cost of others' defection, the prudent Southerner stayed clear of the co-ops.

Appealing though this answer is, one may legitimately ask whether its analytical content is in the end as incisive as it appears. Is "amoral familism" or "low trust" really more than a description of the phenomenon under a different guise? There is, after all, a reasonable alternative to this cultural explanation. It may be that the net benefits one could expect from joining a co-op were smaller in Southern Italy. The gap highlighted in Table 1 would then reflect not a lower propensity to engage in co-operative games but the smaller payoffs available from the games themselves. Whether or not this hypothesis is generally true for Southern Italy (or even other 'low trust' societies) cannot be answered in this paper. All I intend to show in the next two sections is that joining one of these co-ops was not equally

[3] In an example of bureaucratic insanity, the articles of incorporation had to be registered with each of 4 different government offices and published in 3 different official bulletins, all at the signatories' expense. The process took months.

rewarding everywhere. To do this, I need estimate and compare the switching function where joining became attractive in the South and in the North.

Section II: To join or not to join, a simple model.

This section models the decision to join a co-operative lender of the kind described above. I am not concerned here with the design of the co-operative, its policies or investment decisions (Braverman, and Guasch, 1989; Banerjee, Besley and Guinnane 1994). Rather I am trying to establish under what circumstance a rational decision maker would 'switch' from not joining to joining, and thereby gain access to cheaper credit but also accept the risk of defection by other members, which would rebound against them because of the unlimited liability clause. This will allow me to define a switching locus in relation to 'trust,' which can be estimated for the *casse rurali* in different parts of Italy in 1911 (Section III).

Assume that capital is discontinuous, and that a representative individual has an investment project costing x with probability p of yielding r and $(1-p)$ of yielding 0[5]. This individual has net wealth w, assumed to be in fixed assets which are complementary to the inputs that have to be purchased with x to carry out the investment,[6] such that $w<x$. This, plus the usual assumptions about asymmetric information and unobservability, means that the individual will find it difficult, and probably impossible, to obtain credit in the 'formal' market. A local moneylender, with informational advantages unavailable to 'formal' lenders (Galassi 1996), is willing to finance the project at interest rate r_l. The potential borrower has to choose between this form of financing, and joining a co-operative of m members. At any one time, n $(<m)$ members borrow from the co-op, so that a credit note is issued on the market for the amount X $(^{o}$ $nx)$. Each member pays the same interest rate i[7]. The co-op raises X by offering savers an interest rate r. For convenience we may assume that only one

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4 The bankruptcies referred to are those of the 1893 financial crisis, which did not involve co-ops.

5 Probability p is assumed to be exogenous, that is, not affected by agent's efforts or skill.

6 One way to think about this is that the investor owns land and some tools, but has no capital to finance an irrigation project or the purchase of a machine.

7 Though the co-ops could in principle discriminate among borrowers by charging different interest rates, all evidence is that they never did so, probably because this would weaken the reciprocal bond on which their functioning depended.

saver is involved, who has an alternative investment with return *R*. From the saver's marginal condition,[8] the interest rate the co-op has to offer to raise funds is

$$r = \frac{R + (1-p)q}{p}. \qquad [1]$$

where *q* is the cost of seizing the assets of co-op members in case of default as a share of the value of *X* and *p* is the probability of the co-op's defaulting.. The co-op is a price taker in the capital market, but has some latitude in setting its interest rate because borrowers are captive, in the sense that they cannot move elsewhere without incurring dramatically higher borrowing costs (indeed, that is why they are in the co-op in the first place). The difference with an *ex-post* monopolist, however, is that the co-op is not a profit maximiser. Its behaviour in setting prices can therefore be modelled by arguing that the co-op takes its own solvency as the constraint and maximises the members' surplus from the investment project (Galassi 1996). The co-op, that is, will choose the lowest possible *i* consistent with meeting its obligations (repay *(1+r)X* at maturity). Assuming that all non-capital inputs are provided free of charge to the co-op by its members, there still are two reasons why $i > r$. In the first place, the co-operative has an incentive to accumulate reserves, both because these represent funds that can be loaned out to members in the future without having to raise them in the capital market,[9] and because they represent a 'buffer' against default by members. Second, and related to this, the co-op has to set *i* in such a way that even if some members' projects do not work out and/or some members default, it will still be in a position to meet its obligations. This in effect means that the co-op must *ex ante* set what it expects to receive from its borrowing members to be at least equal to its obligations in the capital market. Using γ to indicate the proportion of *m* who are expected to pay their loans, this means that

$$pg(1+i)X = (1+r)X + A \qquad [2]$$

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8 The saver is assumed risk-neutral. Introducing risk aversion complicates the analysis without furthering insight.

9 In this sense reserves may be seen as an intertemporal subsidy: choosing to keep a smaller proportion of the investment surplus today, co-op members may opt for yet lower borrowing costs in the future. The optimal time path of reserves may then be shown to depend on the reduction in borrowing costs and the co-op members' rate of time preference. If the ratio of the reduction in future borrowing costs to the increase in current borrowing costs is greater than the rate of time preference, co-ops will tend to accumulate 'excessive' reserves in the sense that they will not take the cost of accumulated reserve funds into consideration. In other words, since accumulated reserves do not cost the co-op anything, their (discounted) effect on future borrowing costs is almost bound to be greater than their increase on current borrowing costs. Co-ops tend thus to accumulate funds (Di Salvo and Galassi 1997).

where A indicates the amount of reserves the co-op chooses to have at the end of the period.[10] Note that *p* is now indicating the probability of the average investment project paying off. If, *ex post*, $pg(1+i)>(1+r)+A/X$, the difference is assumed to become part of reserves *A*. If, on the other hand, the co-op's receipts turn out to be lower than its commitment, the co-op is assumed to reduce first reserves and then, once $A=0$, to call upon the assets of members to make up the shortfall (note that because of the value of *r* in [1] above, this is already implicit in the right-hand side of [2])[11]. The implication is that the co-op will choose *i* in such a way that

$$i = \frac{1 + r + \frac{A}{X}}{pg} - 1 \qquad [3]$$

In a complete model, a borrower wishing to join a co-op offering loans at *i* would have to invest resources into acquiring a positive reputation (Dasgupta 1988). In this simple framework, however, I treat reputation as given, and focus instead on whether an individual would find joining to be an attractive proposition. This individual will evaluate the net benefit (*B*) of joining by setting the reduction in borrowing costs against, first, the value of inputs which will have to be provided free to the co-op, and, second, against the probability of default by other co-op members. Using l for the value of inputs a member will have to devote to the co-op and *s* for his/her share of any defaulting members' repayment, *B* can be written as

$$B = (i - r_l)x - l - s \qquad [4]$$

The value of *s* has to be carefully specified. As suggested above, if the co-op's receipts fall below the value of $(1+r)X$ by an amount greater than *mw*, the co-op is bankrupt. Thus

$$s \equiv \frac{(1 - pg)nx(1 + i)}{m - (1 - pg)n} \qquad [5]$$

10 More accurately, *A* is the *change* in reserves. This point is discussed in Section III.

11 If $i < (1 + r - q) / pg$, the amount actually repaid plus members' assets cannot cover the co-op's financial commitment, and the co-operative will then simply be bankrupt.

Note that in using *i* instead or *r* I am taking into account the fact that the co-ops reserves can be used to meet a shortfall on loan repayments. Substituting [3] and [5] into [4] and setting *B=0* yields

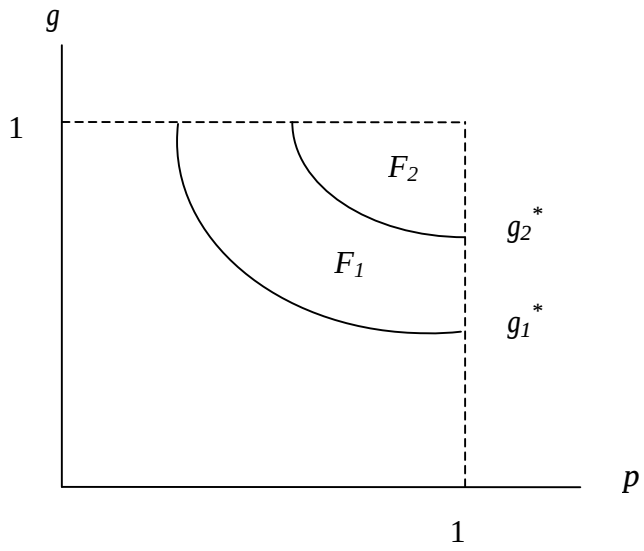
$$p^2 g^2 + \left(\frac{m}{n} - 1\right) pg - \frac{1 + r + \frac{A}{X}}{1 + r_l - \frac{l}{x}} \frac{m}{n} = 0 \qquad [6]$$

This quadratic form defines a locus in *[g, p]* space along which a rational actor will switch from wishing to remain outside the co-op and incur high borrowing costs to wishing to join. Solving for *g*, and noting that only the positive root is of interest in this context, yields

$$g(B=0) = \frac{1 - \frac{m}{n} + \sqrt{\left(\frac{m}{n} - 1\right)^2 - 4\frac{1 + r + \frac{A}{X}}{1 + r_l - \frac{l}{x}} \frac{m}{n}}}{2p} \qquad [7]$$

This solution is important and warrants some discussion. In effect, *g(B=0)* represents the minimum proportion of co-op members whom an individual must trust in order to be strictly indifferent *ex ante* between joining and not joining. I will denote this by g^*. For any *p*, if $g > g^*$, the individual is *ex ante* unequivocally better off by becoming a member. Note that g^* is a decreasing hyperbolic function of *p*, the exogenous probability that the 'average' investment project will actually pay off. This is reasonable, as the riskier the natural environment is (recall the *casse* were rural lenders), the greater the trust in other co-op members must be in order to find joining attractive. However, while the hyperbole is defined by *p*, its actual position in *[g, p]* space is affected by 'structural' variables: the *m/n* ratio, relative interest rates *(r_l* and *r)*, the cost of resources devoted by members to co-op affairs relative to loan size *(l/x)*, the co-op's ratio of assets to loans *(A/X)*. The combinations of *[g, p]* which result in $g > g^*$ I will call the 'feasible set' and denote by ***F***.

Diagram 1: The Feasible Sets in *(g, p)* Space



The diagram illustrates different feasible sets. If an individual is facing combination F_1 with g_1^*, becoming a member of the co-op is welfare improving *ex ante*, and participation will be attractive. If, however, what I am calling structural factors (changing relative interest rates, or increased demands on co-op members' resources) shift the switching locus to g_2^*, F_1 will drop out of $\boldsymbol{F}$, while combination F_2 will still be inside. The point is that joining a co-op of this sort is not unambiguously attractive: membership pays (*ex ante*) only for certain parameter values.

The attractiveness of this formulation, simple though it is, is that it allows me to test the cultural explanation for varying responsiveness of Italian farmers to the *casse rurali*, and therefore by implication to test the Banfield-Putnam "low social capital" view of Italy's poor South. I argued in Section I, and elsewhere (Galassi 1999), that the problem in the South was that farmers were not willing to join, though if a co-op could get on its feet it was by most standards successful. The test therefore hinges on defining the *ex ante* size of feasible sets for farmers in Northern ($\boldsymbol{F}_n$) and Southern ($\boldsymbol{F}_s$) Italy. There are then two possibilities. First, if $\boldsymbol{F}_n > \boldsymbol{F}_s$, the low success rate of Southern *casse rurali* may be the result of fewer feasible combinations existing the South than in the North because of structural factors. This would

cast serious doubt the cultural explanation. Of course it may be that $\boldsymbol{F}_s$ is smaller than $\boldsymbol{F}_n$ by a factor greater than the gap in the relevant parameter of comparison. For example, the North's feasible set could twice as big as the South's but the North might have more than twice as many *casse*. In this case, farmers in the South faced more stringent constraints than their Northern compatriots, but may still be said not to have made the best of existing opportunities for co-operative behaviour, which would point, to a modified cultural explanation. Second, if $\boldsymbol{F}_n \leq \boldsymbol{F}_s$, on the other hand, the implication would be that Southerner farmers failed to take advantage of the same (or greater) opportunities than their Northern cousins. This would provide support for the cultural explanation.

The idea underpinning this view is that the greater $\boldsymbol{F}$, the greater the probability of a co-op being set up. Note that this does not mean that at a particular time and space all possible combinations implied in a given $\boldsymbol{F}$ will have been exploited. There is, in other words, no reason to deduce optimality from particular observed outcomes, even if such a concept could be unambiguously defined in this case. The point is simply relative performance: given the North as a benchmark, did the South behave in proportion?

Before proceeding with a numerical test, it is imperative to make clear what would constitute evidence of equal or different $\boldsymbol{F}$. I will consider $\boldsymbol{F}_n = \boldsymbol{F}_s$ if $g_n^* = g_s^*$ for the same value of p, because this implies that the *position* of hyperbolic function dictated by structural variables is the same in the North as in the South. If, on the other hand, $g_n^* < g_s^*$ for the same value of p, this will constitute unambiguous evidence that $\boldsymbol{F}_n > \boldsymbol{F}_s$. The interpretation of this result is that Northern *casse* were more common because it was easier in the North to find the correct combination of structural variables to set up a co-operative. Putting this differently, Northerners could establish a successful co-op with greater *ex ante* tolerance for defection than could Southerners. In this case, culture becomes of doubtful value as an explanation of differential success.

There is, of course, an alternative story. It may be that demand for credit differed in Northern and Southern Italy, so that the smaller number of *casse* set up in the South is simply a reflection of low demand for credit in that area. The objection is however unconvincing in light of the strong evidence collected by a Parliamentary Inquiry in 1907-8 on the conditions of farming in the South (Galassi and Cohen 1994, 592-3). The complaints from Southern landlords and peasants alike about the difficulty in obtaining finance fill dozens of pages in each of the 12 volumes of the Commission's report. A credit constraint was assuredly

present, and if in the South the *casse* had trouble stepping in to loosen it this was not due to lack demand for their services.

The simple framework outlined in this section has a number of shortcomings, first among which is that actors are depicted as engaging in a once-off game. No attempt is made to model the decision to defect, and reputational issues, repetitive interaction, evolutionarily stable solutions, and risk aversion, are among the many issues not given their due weight. In spite of these gaps, however, the framework has one decided advantage, which is that the limited data available for Italian co-ops at the beginning of the 20th century permit the estimation of the feasible set for this kind of institutional arrangement in different parts of the country. In the next Section I estimate the values of g^* for different areas in 1911.

Section III: How many can you trust?

The Credit Inspectorate of the Ministry of Agriculture was responsible for collecting the balance sheets of *casse rurali* before the 1926 reforms. The Inspectorate issued detailed guidelines on the form the return had to take, and non-filing *casse* ran the risk of having their licences suspended. In practice, however, only about 2 in 3 co-ops bothered to send their balance sheets to the Inspectorate, and many seem never to have sent one, without suffering any adverse consequence. In addition, those balance sheets that were sent did not always conform to Ministry guidelines, so data are often inconsistent. The Inspectorate published the returns, such as they were, in a bulletin (MAIC 1911), listing the number of *casse* in existence per province and the number considered "active" (though there appears to be no clear definition of what this meant). The same publication also reported balance sheet highlights, usually the value of capital and reserves, and the amount of loans and deposits (though not their number). No membership data were collected.

The Inspectorate's bulletin for 31 December 1910 constitutes the source of data used to estimate g^*. The choice of date was dictated by the need to have observations close to a census (one was taken in June 1911: MAIC 1912, Galassi and Cohen 1994) and yet refer to as dormant a time of the agricultural year as possible to prevent different local farming cycles from affecting relative values. This in effect leaves only the winter months. While other dates would have served as well, the number of *casse* returning their balance sheets in the early months of 1911 or December 1911 were found to be considerably fewer than the 719 out of 1144 'active' ones of late 1910. Even so, inconsistencies in information provided by the

casse means that for only 28 out of 30 Northern provinces, and 20 out of 39 Centre and Southern ones, can the value of g^* be computed. Still these 48 provinces accounted for 70% of Italy's provinces, 73% of farmland, and 78% of farm labour (ISTAT 1910-4).

Aside from inconsistencies or gaps in the data set, two objections may be raised against using these data to estimate $\boldsymbol{F_n}$ and $\boldsymbol{F_s}$. In the first place, the existence of a rural co-operative lender in a Southern province means that the original co-ordination problem had been solved, at least once. It is then difficult to see how comparing the $\boldsymbol{F}$ estimated from existing co-ops can give an insight into why in other areas of the South the co-ordination problem had *not* been solved. The very nature of the data may bias the results toward the (possibly incorrect) finding that $\boldsymbol{F}_n=\boldsymbol{F}_s$. The weakness in this objection is that if the economic or natural environment in the South made it less attractive to join a *cassa* than in the North, the estimated g^* should still give a higher value whether or not co-ordination had been achieved. Putting it differently, successful co-ordination should not change the *size* of $\boldsymbol{F}$. The link flows the other way: the size of $\boldsymbol{F}$ makes co-ordination more or less easy.

Secondly, and more generally, g^* is an *ex ante* value, but of course all I can estimate is an *ex post* value, which I will call g^*. It may be, first, that $g^*=g^*$, in which case my estimation accurately represents the choice faced by Italian farmers deciding whether to join a *cassa rurale*. However, if $g^*<g^*$, that is if the feasible set was at the time believed to be greater than it proved to be, some individuals would join even though they *ex post* would have benefited from staying out. Finally, if $g^*>g^*$, the feasible set was under-estimated at the time and individuals did not join who later discovered they would have benefited. Because the value of g^* cannot now be estimated, how can we be sure that the numeric value of g^* is really giving an insight into the choices faced by these farmers 90 years ago?

Referring back to [7] above, some variables involved in calculating g^* would have been in the public domain, namely the rates charged by the co-op, *r,* the rates charged by moneylenders, r_l,, exogenous risk *p,*. and *m,* membership in the co-op. Variables that may have been more difficult to observe were all policy variables set by the co-op, that is the number of loans made, *n,* the reserve to loan ratio *A/X,* and the demands made on members' time, l/x[12] None of them would have been actually impossible to find if inquiries were made, however: certainly the reserve deposit ratio was published in the Ministry bulletin, and the

[12] . These variables are endogenous from the point of view of the co-op, but any given perspective member would have to treat them as given.

other two could have been gathered by asking members of the co-op. The information available was therefore substantially the same as what can be collected to-day, except for p, which was assuredly known in a general way to the farmers at the time, while the actual outcome of the upcoming harvest, known today thanks to official output data, was unknown at the time. No way around this exists[13] except to estimate g^* in the form of ranges of values, calculated by taking into account other evidence as discussed below.

One last point needs to be made before the actual data are discussed: the issue at hand is not whether *ex ante* estimates of g^* made at the time were revealed accurate (that is, whether $g^*=g^*$). The point is rather whether, given a reasonable approximation to g^*, behaviour in Northern and Southern Italy was consistent with these values. If g^* in the South is not significantly different from g^* in the North, then the differences described ion Table 1 must be of cultural origin.

Of the variables in equation [7], two can be derived directly from Ministry publications: the reserve/loan ratio (A/X) and the rate co-ops paid to raise funds (MAIC 1910, 1911). It is important here to return to the issue of A, the reserves accumulated by the co-op. As stated in Section I, A is really the *change* in reserves. However, the variable only enters into the estimation of g^* as a ratio (A/X). While the year to year change in reserves can only be calculated for a handful of co-ops, therefore, what matters is that the A/X ratio should be accurate, that is, that reserves should change proportionally to loans. In all cases where the year to year change in reserves can be calculated, the A/X is remarkably constant (varies by less than 1.5%). Thus the ratio is, if not wholly exact, certainly accurate enough. Data on money market rates paid by the co-ops are available in the Ministry bulletin that reported data on savings banks by province (MAIC 1910).

Of the other variables, the probability of the average investment project financed by a co-op being successful (p) is more involved, and its estimation is described in detail in the Appendix. Suffice it to say that, as calculated, p represents the probability that the average farmer in the 48 provinces could meet repayment of the estimated average loan at current interest rates given the (known) riskiness of crops in that area. The problem with this measure is that it reflects a province-wide risk measure because of course crop fluctuations on the land farmed by co-op borrowers are not observable. This may well result in an

[13] In principle I could use the outcome of previous year's harvests with adjustable weights to estimate an expected value of p. The problem here is that Ministry data do not report long enough data series prior to 1910 to allow me to do so.

underestimate of *p*, which however does not matter to the overall relative results for different areas provided underestimation does not systematically vary with locality.

The ratio of members to borrowers in each co-op (*m/n*) is not available, yet contemporary evidence from Germany suggests that values of 2.5 to 1.67 would be reasonable. Guinnane (1997) found that between 44 and 64% of farmers in two German co-operatives he studied in this period took out loans within the first 6 months of operation, and between 51 and 71% borrowed in the first two years. Virtually the same value (2.38) results from the only case I am aware of where both membership and borrowers can actually be counted, that of the *cassa* in Treviglio (Treviglio 1899)

The *l/x* ratio, resources owned by members but provided free of charge to the co-op as a fraction of the value of the loan, is simply unknown, and I have somewhat arbitrarily chosen two values, 0 and 0.05. The first suggests that perspective members would not expect to be asked to help run the co-op in the early stages of their membership. The second is based on the average loan value derived from MAIC (1911) and Caputo (1989, 38). This gives an estimated average loan of between 300 and 400 *lire* in 1911. If *l/x* is set at 0.05, given that agricultural wages for adult males were 2.10 *lire*/day at the time (Zamagni 1993, 199, tab. 6.4), this implies that the average member devoted between 7 and 10 full days per year to help run the co-op. This seems a reasonable amount, considering that this time was likely spread over several months. Adjusting this estimate upward, in any event, makes no difference to the relative standing of co-ops from different areas.

Finally, data on r_l, rates charged by local moneylenders are difficult to find. While the complaints about 'usurious' borrowing costs were widespread at the time (Lorenzoni 1909, Placanica 1990), actual figures are scarce. Some evidence, however, suggests that 40% was a reasonably typical rate in the South (Lorenzoni 1909, 708). This rate, which is in line with current observations from LDC money markets (Gillis et al.1988, 512), turns out to be exactly 6.25 times the market rate charged by savings banks in the same area at that time (MAIC 1910). This opens up two possible ways of estimating r_l province by province. One is simply to adopt the same 40% as a national figure in the informal money market. The other is to use the ratio of the informal rate to the known savings banks discount rates in the same province, and estimate the informal market rate for each province by multiplying this ratio by local savings banks rates. Because savings bank rates were lower in the North than in the South, the first method is more questionable, in that it attributes to local moneylenders in the

North a greater market power than in the South. The second assumes an equal degree of market power, and is definitely preferable.

Table 3 reports estimates of g^* for the ranges of l/x [0, 0.05]; and m/n [1.67, 2.5] discussed above. The regional figures have been calculated as follows. On the basis of [7], g^* has been estimated using each individual co-op's A/X and interest rate, plus of course the relevant values for parameters l/x and m/n, and the province-wide estimate of p. The regional figures were then computed by weighing each co-op's g^* by its share of assets in the regional total. To avoid burdening the paper with numbers, the Table only reports the minima and maxima for the parameter ranges, omitting intermediate values. Ignoring the last two rows of the Table for the moment, the first conclusion to be drawn is that the feasible sets seem *not* to have been the same in Northern and Southern Italy. With the same parameter values, Southern estimates of g^* are significantly different from the North's: on average, the South registers values some 10 standard deviations higher than the North's mean. Interestingly, however, the opposite is not true: Northern values are well within 1 standard deviation from the South's mean. Northern values, that is, cluster markedly more than Southern ones, as in Table 1. Some regions in the South have 'Northern' characteristics, and others are definitely distinct, especially Abbruzzi, Sicily and Calabria.

These results suggest that it was objectively more difficult to set up a co-op in Southern Italy, or at least in some Southern regions, than in the North. Southerners needed to trust a greater proportion of their neighbours to find that membership was worth the risk, and thus not surprisingly started fewer co-ops, than their Northern colleagues. The correlation coefficient between the values of g^* in Table 3 and the number of co-ops enumerated by the Ministry (MAIC 1911) varies between –0.21 and –0.25, depending on the parameter range. This makes sense: the higher the estimated switching point for joining, the more difficult it was to solve the co-ordination problem and organize a co-op.

Table 3: Estimates of g^* by region

Regions	**Provinces included out of total in region**	**Co-ops included out of total in region**	l/x**=0.05** m/n**=1.67**	l/x**=0** m/n**=2.5**	**Regions**	**Provinces included out of total in region**	**Co-ops included out of total in region**	l/x**=0.05** m/n**=1.67**	l/x**=0** m/n**=2.5**	l/x**=0.05** m/n**=1.67**	l/x**=0** m/n**=2.5**
										(a)	(a)
North	28/30	571/808	0.8854	0.8463	**Centre/ South**	20/39	148/336	0.9246	0.8835	0.8856	0.8486
s.d.			0.0038	0.0041	s.d.			0.0663	0.0633	0.0035	0.0039
Piedmont	4/4	67/112	0.8822	0.8432	Tuscany	2/8	8/9	0.8831	0.8443	0.8836	0.8462
s.d.			0.0017	0.002	s.d.			0.0022	0.0023	0.0022	0.0023
Liguria	1/2	3/3	0.8914	0.8497	Marche	3/4	29/40	0.8939	0.8585	0.8892	0.8523
s.d.			0.0027	0.003	s.d.			0.0058	0.0086	0.0012	0.0013
Lombardy	8/8	124/181	0.8843	0.8445	Umbria	0/1	0/3	n.a.	n.a.	n.a.	n.a.
s.d.			0.0025	0.0024	Latium	1/1	19/35	0.8869	0.8486	0.8874	0.8505
Venetia	8/8	337/408	0.8847	0.846	s.d.			0.024	0.036	0.0017	0.0019
s.d.			0.0027	0.003	Abbruzzi	2/4	7/16	0.9238	0.86	0.8877	0.8509
Emilia .	7/8	40/104	0.8897	0.8515	s.d.			0.0057	0.0061	0.0054	0.0045
s.d.			0.0039	0.0044	Campania	3/5	5/10	0.8849	0.8454	0.8834	0.8463
					s.d.			0.0027	0.0012	0.0004	0.0004
					Apulia	2/3	8/18	0.8857	0.8457	0.8831	0.846
					s.d.			0.003	0.0014	0.0002	0.0002
					Basilicata	0/1	0/4	n.a.	n.a.	n.a.	n.a.
					Calabria	2/3	14/20	0.9505	0.908	0.8862	0.8494
					s.d.			0.0671	0.0631	0.0023	0.0025
					Sicily	5/7	58/181	0.9365	0.896	0.8863	0.8494
					s.d.			0.0634	0.061	0.0045	0.005
					Sardinia	0/2	0/0	n.a.	n.a.	n.a.	n.a.

(a): simulation of g^* for the South using the mean value of p for the Northern provinces

The source of the North-South difference is intriguing. Usually, p values are considerably lower in the South, reflecting the riskier environment. If the average p for the 28 Northern provinces is used when estimating g^* for the 20 Southern ones, as was done in the last two columns of Table 3, the difference, for given values of other parameters, disappears entirely. Southerners had to trust one another more than Northerners not because of "structural" problems, but because they lived in a riskier area. This is interesting, because it suggests that the Italian capital market was reasonably well integrated in the early 20th century. Borrowing costs differed (savings banks rates were 0.3 to 0.5% higher in Southern Italy) in all likelihood precisely because the South, having an economy still closely tied to the vagaries of weather, faced higher default rates. But it was not the cost of capital that made starting a *cassa* such a difficult undertaking. The problem was that exogenous risk was higher in Southern Italy.

On closer inspection, however, this interpretation needs to be qualified. In the first place, the correlation coefficient between g^* and the number of co-ops, while it has the "right" sign, is also rather low. Secondly, if instead of using the national sample the data are disaggregated to calculate the correlation for the 28 Northern provinces and the 20 Southern ones separately, the Northern coefficent is indistinguishable from 0 (-0.0093), and the Southern one is actually positive (0.058), though weak. This is obviously the influence of the particular situation in Sicily, but even without that region the value falls to "only" –0.079. Thirdly, inspection of Table 3 will reveal that while the values of g^* cluster in the North, the number of co-ops reported by the Ministry varies widely.

Finally, and most importantly, there is no denying that any North-South differences are small: the area of $\boldsymbol{F}$ implied by the values in Table 3 varies by 4.5/5.5% between North and South. The gaps are also extremely sensitive to specific parameter values. If Southern co-ops imposed fewer demands on their members or approved fewer loans, the gap with the North, even with the higher p values for the South, disappears. Another way of stating this is to say that careful management of the co-op could produce in the South a bank that was as safe and viable as one in the North, higher risk notwithstanding. Interestingly, Southern co-ops appear to have been aware of this: the A/X ratio is lower on average in the Centre-South than in the North (the lower A/X, the lower is g^*). They were, in other words, trying to make joining as easy as possible. This confirms what has already been mentioned in Section I, that while co-ops seemed to have trouble starting in the South, they performed as well as those in

the North once they were in place. The obstacle appears to have breaking down that initial diffidence.

The reason for that diffidence is therefore the heart of the matter. A culture of mistrust is the obvious candidate, and the estimates certainly make it difficult to exclude that out of hand. No discussion of the Italian South is complete without invoking yet again the centuries of mismanagement at the hands of various foreign rulers, and the clan-oriented, fractured society that resulted from subjection to an authority that was perceived as alien and interested only in extracting rents. But what appears out of the present analysis is a slightly different picture, one that remains to be confirmed but is nonetheless potentially just as important as more orthodox historical accounts. In a risky environment with imperfect information, the uncertainty involved in entering into any co-operative game is compounded by the difficulty in determining whether any specific outcome is due to non-co-operative behaviour on the part of other players or just "unlucky" circumstances. In these conditions, evolutionarily stable co-operative behaviour may be difficult to arrive at. All evolutionarily stable strategies, such as those studied by Nowak and May (1995) and Boyd (1992), depend on there being *ex post* no uncertainty concerning the actions of other players. Retribution or further co-operation can then be meted out depending upon whether others have defected. But if defection is difficult to separate from ill luck, it may be in a player's interest in the long run not to engage in co-operative games at all except where information channels are very efficient and/or repeated engagement on several simultaneous fronts reduces the probability of defection to very low values. Aside from reducing the probability of suffering defection by keeping engagement within these narrowly confined lines, a player would also avoid the problem of mistaking ill luck for defection, and thereby arousing ill-will in other, innocent but unlucky, players, which may then make future co-operative engagement even more difficult. It would hard to find a clearer statement of the rationale underlying Banfield's "amoral familism".

The link between high exogenous risk and a culture of low trust remains of course to be proven in theoretical work, and this is not the place to pursue it. But what the numerical exercise reported in Table 3 has shown is that there was indeed a difference between the choice sets faced by Southern and Northern Italians, and that this difference was not, or not wholly, man-made. To overcome the less predictable environment they lived in, Southerners had to accept a stricter discipline than their colleagues in Northern Italy. Whether this was at all possible given the culture that may have been engendered by that very environment has to

remain for the present at least a moot point. But the evidence is reasonably clear that they lived under different objective constraints, and if as a result they adopted strategies that appear in retrospect to have damaged their chance of development, invoking "culture" as if it were a "first mover" cannot suffice as an explanation. Their reaction to the *casse rurali* strongly suggests that they laboured under non-removable constraints, and these may have done more to shape their choice set than conventional histories give them credit for.

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Conclusion.

The answer to the riddle of the poor South goes well beyond the scope of this paper. Still, the results presented here are challenging. North and South faced constraints that appear, with the necessary qualifications due to poor and incomplete data, to have been sufficiently different for Southerners to be at a disadvantage even if their cultural baggage had been identical. To make a *cassa rurale* an attractive proposition, the data suggest that Southerners had to trust a higher proportion of their neighbours than their Northern compatriots. This was not uniformly true: there were areas in the South where the parameters suggest that it would have been as easy (or difficult) to set up viable co-ops as in the North. Yet the gap is there overall. At one level this is further evidence that Italy's underdeveloped area was not a uniform backward economy, but varied substantially from place to place, something that contemporary studies on the South have emphasised repeatedly (Lumley and Morris 1997). In a different way, however, the paper opens a research agenda on the economics of persistent backwardness whenever this has been explained as the result of cultural factors. Culture, understood as a set of probabilities favouring a type of outcome over another, may simply be the adaptation of behaviour and expectations to objective constraints. If Southern Italians found that the payoffs to co-operative engagement were subject to a great deal of "noise", it would not be surprising that they chose to limit co-operation to those social relations in which noise could more easily be detected. This approach to a low trust equilibrium does not dispense with the specific historical background of the Italian South. History, on the contrary, retains its weight, but equally is it true that other areas in the developed world have been misgoverned for long periods of their history and have not necessarily ended up in a position such as the South's. Besides, the very ease with which foreign powers were able at different times to take over Southern Italy may itself be a reflection of the same basic disinclination of Southerners to co-operate in the provision of a public good (defence). In any event, appealing to the explanatory power of culture as if it

were an immutable given may, in fact, hide more than it reveals, and may even deflect attention from the logic that underlies particular attitudes.

APPENDIX

Estimation procedure for p.

In the framework presented in Section II, p is the probability that an investment project undertaken with financing from a *cassa rurale* will succeed (= pay r). As already noted, this can be extended to the entire loan portfolio of the co-op, so that p comes to indicate the share of loans that have financed successful projects. While that is enough for a theoretical framework, empirical analysis requires a clearer definition of what constitutes 'success' in this context. One simple way to define it is to say that p is the proportion of investment projects financed by a co-op in which the increase in output generated by the project was at least equal to the interest payments on the loan. Taking this definition as a base, I develop in this Appendix an estimation of the value of p for the 48 Italian provinces in 1911 for which I have co-op data.

In order to estimate p, note first that the *casse* at this time seldom financed loans for longer than one year. Variable p therefore has to be seen as the proportion of investment projects financed by a co-op in which the increase in output generated by the project was at least equal to the interest payments plus principal. While loans were no doubt rolled over, we have no way of knowing now what proportion of them was and for what amounts. Taking the position that borrowers had to repay the full amount in twelve months in effect means that we may be over-estimating the repayment burden, thereby calculating a lower p than was the case. If there is any such bias in the procedure, however, the results suggest that it is extremely small.

Lack of data on the marginal product of investment projects can be overcome reasonably easily. Let v be the value of output per unit of land on which the investment project is carried out, and let $v \sim N(v, s_v)$. The increase in output from the investment project will then be $v + e s_v$, where $e \sim N(0, 1)$. Then

$$p = \Pr\left[v + e s_v \geq (1+i)x\right]. \qquad \text{[A-1]}$$

This implies that

$$p = \Pr\left[e \geq \frac{(1+i)x - v}{s_v}\right], \qquad \text{[A-2]}$$

which can be estimated from a normal curve.

This brings the solution closer, in that *v* and s can be estimated for the sample areas in the years before the First World War. However, there remains the problem of *x* and *i*, respectively the loan size and the interest rates charged by the co-ops. For the latter, the evidence is that the *casse* typically charged 2.5 percentage points above their borrowing costs (Cooperazione 15.3.1904, 24; Branzoli-Zappi and Mazza 1907, 61; Darling 1922, 33). This brings the estimated rates charged on loans to around 7.5/8.5%, consistent with the limited available evidence (Darling 1922, 33).

The estimation of *v* and s_v is reasonably straightforward. Ideally the information on yields would relate to the land tilled by the borrowers themselves and their particular crop mix. Failing that, it does not seem unwarranted to use province-wide data to estimate average expected income variance for farmers in a given area. What we need is to have provincial output, land and price data over a number of years for as many farm products as possible, so as to construct a meaningful estimate of the standard deviation of farm income in the 48 provinces. It turns out that these data are available only for a handful of products for the years leading up to 1911, namely wheat, wine, olive oil, corn, and potatoes (ISTAT 1910-4, Cohen and Galassi 1990, 655, for methodology). Even aside from the problem of excluding all livestock products, the list is obviously too short, yet these crops together accounted for over 50% of the total value added in Italy's agricultural sector in 1911 (Federico 1992). A measure of variance derived from this list, if not exhaustively computed, will at least be broadly indicative. Using q_{jt} to indicate the yield per hectare of the jth crop in year t, m_t its price, w_{jt} the share of land devoted to it, and *T* the number of years over which the data are available (in this case, 1909 to 1912), *v* and s_v can be calculated for any given province as

$$v = \frac{1}{T}\sum_{T}\sum_{j} q_{jt} m_{jt} w_{jt} \qquad \text{[A-3]}$$

and

$$s_v = \sqrt{\frac{1}{T}\sum_{T}\left(\sum_{j} q_{jt} m_{jt} w_{jt} - \frac{1}{T}\sum_{T}\sum_{j} q_{jt} m_{jt} w_{jt}\right)^2} \qquad \text{[A-4].}$$

The last variable to be estimated before [A–2] can be computed is *x*, loan size. The average loan size used in Section III is of little use here, as it refers to average loan per

member, while the only measure of income variance I can reconstruct is income per hectare. What has to be done is to relate loans to land tilled by members. Using the total loan portfolio of the 719 *casse* used in these estimates, an average loan/hectare ratio can be approximated provided that an estimate of borrowers for these 719 co-ops can be developed. This involves four steps:

1) calculating mean national membership size, and estimating how many people belonged to the co-ops located in each of the 48 provinces (this has to be done province by province, since the output variance data are only available province by province.) National membership is known, but not provincial membership. However, since Southern *casse* were smaller in terms of assets per worker (Table 1), it is reasonable not to limit the estimation to a national mean membership figure. I have therefore used two extreme values in the estimate, one which consisted of assuming the same national mean applied in every province, and one where Northern *casse* have a membership three times the Southern mean.

2) since not all members were net borrowers at any one time, this number has to be reduced by the fraction who did not borrow in 1911. As outlined in the text, this is estimated at between 2.5 and 1.67.

3) since only one person per family could be a member of the co-op, the estimate of the number of borrowers has to be multiplied by mean number of workers per family to estimate the total number of farmers who were financed by the sample co-ops (family size data are from ISTAT 1976).

4) finally, using the known provincial land/labour ratios, the number of farm workers benefiting from co-op credit can be used to estimate the number of hectares over which, in a sense, the credit was extended. Dividing the total loan portfolio by this estimate will give at least a rough value for *x*.

There is no need to emphasise the number of strong and weak assumptions involved in this methodology. The results have to be treated with great care and must not be seen as anything more than broadly indicative. Even so, what emerges is interesting.

I report below the actual calculation of for 2 randomly chosen provinces (Forlì in the North, an area of marshy land and extensive farming, and Catania in the South, an intensively farmed province), as an example of the procedure. The bias my methodology is likely to impart to the results is discussed at each stage.

1) Membership size and members per province: in 1911 national mean *casse* membership was 50 (Tamagnini 1952, 105; Caputo, 1989, 38). If membership was equal in each *cassa*, this implies that 1100 farmers belonged to the 22 co-ops in Forlì; and 1755 to the 35 in Catania. At the other extreme, if Northern membership was three times Southern membership per *cassa*, Forlì would account for 1650 members and Catania for 875.

Direction of bias: the values are intended to represent extremes of a likely range, so no specific bias is introduced here

2) Net borrowers in 1911: reducing these totals by a factor of 0.6 and 0.4 yields

Estimated Borrowers in Selected Provinces

	National Mean Membership		**Differential Membership**	
Province	***m/n*=2.5**	***m/n*=1.67**	***m/n*=2.5**	***m/n*=1.67**
Forlì	440	660	660	990
Catania	700	1050	350	525

Direction of bias. again, the values are intended to represent extremes of a likely range, so no specific bias is introduced here.

3) Farm workers financed by the sample co-ops: average family size excluding people under 14 and over 70 in 1911 was 3.1 in Forlì and 2.5 in Catania. Thus farm workers directly or indirectly financed by co-ops range from 1365 and 3069 in Forlì, and from 875 to 2625 in Catania.

Direction of bias: since family sizes are available only by province, not by sector of employment, the most likely error here is that urban families, which tend to be smaller than rural ones, are reducing the estimated number of farmers financed by the co-ops. While this could introduce a bias (underestimating the number of co-op financed farmers in more urbanised provinces), as a rule the more rural Southern provinces have smaller family size than Northern ones.

4) Loans per unit of land farmed by co-op members and their families: land/labour ratios in 1911 were 3.25ha/worker in Forlì and 1 in Catania. Estimates of land farmed by borrowers and their families are reported below

Estimated Hectares Farmed by Co-op Members in Selected Provinces

	National Mean Membership		**Differential Membership**	
Province	***m/n*=2.5**	***m/n*=1.67**	***m/n*=2.5**	***m/n*=1.67**
Forlì	4433	6649.5	6649.5	9974.25
Catania	1750	2625	875	1312.5

From this, using the loans reported by the Ministry (MAIC 1911), I can estimate the average credit 'load' per hectare of land farmed by co-op members.

Estimated Loans per Hectare Farmed by Co-op Members in Selected Provinces
(Current *lire*)

	National Mean Membership		**Differential Membership**	
Province	***m/n*=2.5**	***m/n*=1.67**	***m/n*=2.5**	***m/n*=1.67**
Forlì	6.51	4.34	4.34	2.89
Catania	19.57	13.05	39.15	26.10

Direction of bias if co-op members were richer than the average farmer, land estimates will be too low and loan/land ratios too high. However, there is no reason why this should affect the two provinces (or generally Northern and Southern provinces) differentially

The last step in estimating p is to calculate the probabilities defined by [A-2], recalling that $e \sim N(0, 1)$. I will just give one for each province, purely for exposition.

Forlì (Differential membership, m/n=1.67):

$$p = \Pr\left[e \geq \frac{1.0845(2.89) - 210.19}{24.06}\right] = pr(e \geq -8.61) \rightarrow 1$$

Catania (Differential membership, m/n=1.67):

$$p = \Pr\left[e \geq \frac{1.089(26.10) - 469.41}{86.43}\right] = pr(e \geq -5.1) \rightarrow 1$$

The estimated value of p for these provinces does not mean that investment projects in agriculture were riskless, but rather that in these areas the likelihood of a farmer being unable to repay a loan because of generalised crop failure was, with these parameters, virtually nil. Interestingly, Catania was one of the few areas in the South with a large number of flourishing co-ops.

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