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12 March 2008

FIRMS AS MONITORS OF OTHER FIRMS: MUTUAL GUARANTEE INSTITUTIONS AND SME FINANCE

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March 12, 2008

Abstract

A large body of literature has shown that small firms, due to their opaqueness, may find it difficult to access the credit market. Informational asymmetries may be mitigated by posting collateral or by building relationships with lenders (*relationship lending*). However, in some cases, due to a lack of collateral or of a long credit history, small enterprises may still find it very difficult to raise external finance unless alternative contracting schemes emerge. In particular, group lending or similarly micro-finance are examples of such alternative lending contracts. In this paper, we investigate the effect of mutual guarantee institutions (MGI) on loan interest rates. We argue that, similarly to group lending and micro-finance, firms affiliated to a MGI are linked by a joint responsibility for the loan providing MGI affiliates with peer monitoring incentives. Indeed, each MGI member contributes to the guarantee fund that is then posted as collateral to loans granted to MGI members. As a consequence, MGI willingness to post collateral signals firms credit-worthiness to banks. The econometric analysis supports the hypothesis that these consortia improve lending conditions for small firms.

JEL classification: D82, G21, G30, O16.
Keywords: credit guarantee schemes, group lending, joint liability, microfinance, peer monitoring, small business finance.

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1. Introduction and main conclusions[1]

According to the latest available data (European Commission, 2005), there are more than 20 millions firms in Europe providing employment for more than 140 million people. In terms of employment, over two thirds of all jobs are provided by small and medium enterprises (SME). Notwithstanding their great importance in the economy, a large body of literature has shown that, due to their opaqueness, SME can suffer from difficulties when accessing the credit market (Petersen and Rajan, 1994, Berger and Udell, 2004).

Information asymmetries may be, at least in part, mitigated by posting collateral or by building relationships with lenders (*relationship lending*). However, small enterprises, due to a lack of collateral or of a long credit history, may still find very difficult to raise external financial resources.

Other contracting schemes may emerge to mitigate particularly severe asymmetric information problems. In particular, group lending (like in microfinance loans) is an example of an alternative lending contract in which banks, instead of lending to a single borrower, lend to a group of borrowers linked by a joint responsibility for the loan.[2] One rationale for this alternative source of finance being effective in mitigating asymmetric information problem is that each member of the group is better informed than banks about other members' characteristics and behavior. Thus, the members accepting a joint responsibility for a loan convey a good signal to banks about their creditworthiness. Furthermore, under such lending technology, group members agree to shoulder a penalty in the case of default by a peer and

[1] We would like to thank Elisabetta Cervone, Xavier Freixas, Giorgio Gobbi, Marcello Pagnini, Fabio Panetta and Angelo Zago for useful comments. The usual disclaimer applies. The opinions expressed in this paper are those of the authors only and in no way involve the responsibility of the Bank of Italy or of any other institutions with which the authors may be affiliated. We also thank Marco Massitti for his excellent research assistance.

[2] For a review, see among others, Armendáriz and Morduch (2005).

therefore have incentives to monitoring each other[3].

Another reason for group lending being successful in improving credit market access for small firms is that, notwithstanding each firm suffers individually of a lack of collateral, by joining each other they can provide the bank with the social capital within the group.

In this paper, we analyze the role in lending relationship of Mutual guarantee institutions (MGI) that is an institutional device that puts under the same responsibility a group of small firms that need bank lending but individually have a limited collateral capacity. The functioning of the MGI is very simple: each member contributes to the guarantee fund that is then posted as collateral to loans granted to MGI members. Since members are mostly part of the same local community, as reported from the MGI associations a *peer-monitoring* is in place and our hypothesis is that it significantly mitigates moral hazard effects.

MGI are quite widespread in Europe: on the base of the latest available data provided by the *European Mutual Guarantee Association*, in the European Union there are more than 1.4 million of SME affiliated to a MGI. The diffusion of mutual consortia is particularly relevant in Germany, France, Spain and Italy. Italian MGI represent the largest component of the European mutual guarantee sector, since they account for 37 per cent of the total outstanding volume of guarantees to SME.

MGI intervene in the bank-firm relationship in different ways, mitigating problems of access to bank loans for SME that have insufficient collateral or lack of a sufficient track record or credit history. First, they supply personal and real guarantees to the bank that allow a partial coverage

[3] This mechanism is similar to a collective credit agreement. As stressed by Armendáriz (1999), in contrast to the standard bilateral creditor–borrower debt contracts, such agreements involve, on a collective basis, a group of borrowers without collateral who are linked by a ''joint-responsibility'' default clause: if any member of the group defaults, other members have to repay to the bank her share of the debt, or else the entire group loses access to future refinancing.

of potential losses of SME lending. In the new financial set-up designed by Basel II the relevance of these guarantee schemes is growing since they may also offer the possibility, under certain conditions, of a mitigation of the risk associated with banks' SME portfolio and a reduction in regulatory capital requirements for financial intermediaries.[4] Second, MGI negotiate collectively interest rates and other conditions with banks. Third, MGI provide *screening* and *monitoring* activity of affiliated firms that come together with *peer-monitoring* activity.

MGI associations are formed directly by enterprises and are usually located in the headquarters of the business associations that promote them, or hosted by chambers of commerce. This helps to increase the information exchanged between firms within the business association and the MGI association. MGI in Italy are typically affiliated to business associations by means of federations that provide organizational assistance, including staff support, technical equipment and premises. They also lobby local and national government and chambers of commerce to provide the MGI association with the necessary funds.

In this paper, we focus on the Italian credit market using a unique dataset including loans to small businesses (i.e. firms with less than 20 employees). We verify whether MGI make firms affiliated with them borrow at better conditions than other similar firms. To this aim, we use data on individual loans from the Italian Credit Register and the Survey on Loan Interest Rates. Since we are interested in identifying the effect of MGI affiliation on loan interest rates independently from the collateral posted by MGI itself, we focus on overdraft loans, typically not backed by any guarantee. In this way, we are able to verify whether or not the MGI

[4] The new Basel II accord qualifies most MGI as guarantors, if their guarantee product is in line with the regulatory requirement (Gai, 2005; Vallascas, 2005). This will allow banks to reduce regulatory capital on their SME loan portfolio.

willingness to post collateral is a good signal for banks. In other terms, we test whether MGI are better informed than banks about their firms.

We also test whether MGI characteristics affect the cost of lending for their members. Such tests aim at shedding some light on the internal functioning of MGI in order to establish the ultimate causes of the reduction, if any, in asymmetric information problems. In particular, we verify whether an optimal scale exists for MGI and whether contributions to the guarantee fund from the public sector may improve or deteriorate the information gathering incentives for MGI. Italy represents an interesting laboratory to test for these effects. First, there is wide heterogeneity in MGI size. Second, not all MGI receive contributions from local and central governments, around 10 per cent of MGI receive such contributions accounting on average for more than 50 per cent of the total funds. In theory, public funds may both improve or deteriorate the informational efficiency for MGI. On one hand, public funds raise a typical problem of moral hazard. On the other hand, it could also be the case that the presence of public funds into the MGI may convey a positive signal to the lender about the capacity of the MGI of attracting more external funds that may be used as additional collateral and reduce the risk incurred by a private lender.

The main results of the paper are the following. First, small firms affiliated with a MGI obtain finance at interest rates that are significantly lower than other small firms; the benefit is greater for small firms located in the South where asymmetric information problems are the most severe. Second, affiliated firms have a probability to go into default lower than other firms with the same characteristics; the probability to go into default drops considerably if the firm is located in the South of Italy. Third, an increase in the number of firms affiliated to a MGI improves the peer-monitoring effect but up to a limit; when the number of borrowers in the group increases too much, the free riding problem overcomes the benefits of peer monitoring coming from additional firms.

The paper is organized as follows. Section 2 reviews the literature and discusses the effects of a group-lending technology in reducing asymmetric information problems in the bank-firm relationship. Section 3 presents some facts on the activity and the institutional characteristics of MGIs (more details are provided in the Appendix). Empirical results are reported in Section 4, while Section 5 discusses robustness of the results considering, among other tests, the effects on MGI benefit of the group size and the public contribution to the fund.

2. Some facts on the activity of Mutual guarantee institutions

Italian MGI are typically constituted under the form of guarantee cooperatives, which are non-profit companies for the support of the members and with the creation of a syndicated fund. Italian MGI have to be entered in a special register (ex art. 107 of the Italian Banking Law) and are subject to prudential regulation only when they reach a specific threshold of activity.

The capital endowment of a MGI (legal capital and risk funds) has to be not less than 250.000 euro. Capital and risk funds may also be subscribed by third parties (local and central government, chambers of commerce, international organizations, business associations). However, at least one fifth of the capital endowment has to be paid out by affiliated firms. On the base of information released by Fedart and Federconfidi, around one third of MGIs' capital endowment is paid by SME.

The primary activity of MGI is to provide members with guarantees to be posted as collateral to bank loans. For this purpose, a guarantee fund (generally monetary) is established and deposited at a bank, being funded by members through fixed membership fees and commissions proportional to the loans granted (0.2 to 1.0 per cent of the financing for the duration of the

guarantee).[5] The bank with which the MGI has an agreement is willing to grant credit to member enterprises for a "multiple" of the guarantee fund. In Italy the ratio is generally between 10 and 20 and it is linked to the pattern of past losses incurred in respect of the mutual guarantee fund. In other countries the maximum limit of the "multiplier" may be fixed by national law. For example, in Germany and Switzerland the amount of credit granted may not exceed 10 times the guarantee. Personal guarantees may also be used: they come directly by the affiliated firms and are included in a personal guarantee fund managed by the consortium.

In case of insolvency the bank notifies the MGI of an action to recover the loan and requests the guarantee fund to take action. The MGI checks the request and if it is justified, authorizes the bank to draw the amount corresponding to the risk assumed by the MGI (typically 50 per cent of the loss). The bank proceeds with the action to recover the loan, on the conclusion of which, it informs the MGI of the degree of success achieved. If the action is successful the bank reimburses the amount advanced by the guarantee fund. If it is not successful, the loss to the MGI is final.[6]

At the end of 2004, more than one half of Italian MGI was affiliated to one of the five main federations: Fedart-Fidi (crafts), Federconfidi and Fincredit (manufacturing), Federascomfidi and Federfidi (commerce, service and tourism), for a total of almost one million of affiliated firms (Table 1). MGI in Italy are organized by homogenous activity and this, potentially, may increase the overall risk. However, a high degree of positive correlation in business activity amplifies peer monitoring and thereby reduces the incidence of strategic default; moreover, keeping operations within a limited

[5] Some MGIs with a low amount of funding or guarantees may ask for a deposit of around 5 per cent of the amount of the loan that is returned when the loan is repaid.

[6] At the second level of the guarantee system, there are sometimes second-tier mutual consortia that are set up by groups of MGI. Their function is to reinsure, or in other words to counter-guarantee, MGI in order to reach a broader sharing of the financial risk involved. At the same level reinsurance entities funded by regional governments may operate.

geographical area allows for a thorough knowledge of the local firms.

The average number of affiliated firms per MGI varies between a minimum of 634 in the manufacturing sector to a maximum of 2.598 in the commerce sector. The total value of loans backed by mutual guarantees is greater than 20 billions euro; around one third is under the form of short-term lending. Total guarantees amounted to 7.8 billions, with an average value of the guarantee-to-loan ratio of more than one third. Guarantees are mainly composed by monetary funds that represent between 73 and 90 per cent of the total. Personal guarantees are more developed in the manufacturing sector where the average size of firms is higher.

One feature of the Italian MGI system is that it is heterogeneously developed among geographical areas. MGI activity is concentrated in the North where the presence of small and medium sized firms is more widespread. MGI are less developed in the South and the Islands (Mezzogiorno) both in terms of number of affiliated firms, average capital of consortia and value of guarantees (Figure 1). This may depend not only on the small number of firms that have the necessary characteristics to join a MGI in this part of Italy but also on other three facts: i) greater availability of public funds for firms located in the Mezzogiorno, ii) the relatively recent development of MGI system in the South, iii) the high degree of opacity of SME in these regions. At the end of 2004, credit guaranteed by MGI represented around 8 per cent of total lending to SME in the Mezzogiorno against 13 per cent in the Centre and in the North.

According to information obtained by the Italian Credit Register (CR), at the end of June 2005 around 55 per cent of Italian banks (excluding branches of foreign banks) lent to SME affiliated with a MGI (Table 2). Around one third of firms affiliated to a MGI had lending relationship with large banks (those with total assets of more than 20 billions euro); the percentage was equal to 22 per cent for medium banks (with total asset

between 20 and 7 billions) and to 46 per cent for small banks (those with total assets less than 7 billions).

3. Mutual guarantee institutions, firm strategy and loan interest rate setting

In this section, we describe the mechanism through which a firm decides to ask a loan directly to a bank or by means of a MGI. As we discussed above, we argue that MGI may mitigate asymmetric information problems in the credit market for opaque borrowers, whether their screening technology is more accurate than the one available to banks. As a consequence, banks may interpret the willingness of MGI to post collateral as a good signal of borrowers credit-worthiness, thus lowering loan interest rates.

From an empirical point of view, the comparison between loan interest rates paid by MGI firms and those paid by other firms has to take into account the firm lending strategy.

We can distinguish between two possible cases:

a) the borrower asks first a MGI for posting collateral and then asks a bank for a loan;

b) the borrower asks first a bank for a loan and then, if rejected, may ask a MGI for posting collateral and then asks the bank for a loan again.

In the first case, the pool of applicants for a MGI guarantee is potentially the whole set of firms. In practice, due to the high accuracy of MGI screening technology, only "good" firms ask a MGI for collateral. In other terms, the borrower-MGI matching is endogenous but this endogeneity is driven by the high accuracy of MLCG screening technology. In this context, the signalling effect of the willingness of MGI to post collateral is fully observable.

In the second case, the borrower-MGI matching is more complex since banks act as a first screener of potential borrowers. In particular, by allowing some heterogeneity in banks' screening technology, we argue that the pool of firms asking a MGI for collateral depends not only on MLCG characteristics but also on bank screening efficiency. As a consequence, the overall effect of the willingness of MGI to post collateral reflects both banks and MLCG ability to sort good borrowers. Thus, the more the bank is able to identify good borrowers the worst is the average quality of firms asking for a MGI collateral since these are firms whose borrowing request has been previously rejected from a bank. This adverse effect may be so strong that, notwithstanding the higher accuracy of MGI screening technology, we would observe that, conditional on the willingness of MGI to post collateral, firms pay a higher interest rates compared to other firms.

Naturally, firms choose between these two possible sequences of actions according to their type. Thus, from an empirical point of view we cannot disregard the second possible sequence of actions.

To clarify this point, let assume that firms quality may be high (*H*), medium (*M*), or low (*L*) which, in absence of any screening effort, are not distinguishable. Low-quality firms are never credit-worthy, medium-quality and high-quality firms are always credit-worthy.

Let also assume that banks may be of two types, depending on the accuracy of their screening technology, good (*g*) and bad (*b*) banks. The quality of banks is common knowledge while firm type is private information. The screening technology available to banks is such that:

- banks are not able to distinguish between *H* and *M* type firms but they are able to sort *L* type firms out, even if by a noisy screening technology;
- good banks screening technology is more accurate than bad banks one;

- MGI are able to distinguish between *L*, *M* and *H* with some noise. Their screening technology of opaque borrowers is more accurate than the one available to good banks;

In this context we analyze firm strategies. Let consider *L*-firms first. The best they can do is to ask a bad bank for a loan. Indeed, in this case the probability of rejection is the lowest. However, if rejected, they can ask a MGI for collateral and, conditional on the willingness of a MGI to post collateral, they can borrow from a bank. In this case, even if the firm is not credit-worthy, it can obtain credit just because both the bank and the MLCG makes a mistake in evaluating the firm.

M-firms strategy is more complex. In their case, the best would be to be perceived different from *L*-type firms but indistinguishable from *H*-type. Thus, they ask first a good bank for a loan and, if rejected, they ask a MGI for posting collateral. Finally, as far as regards *H*-type firms, since they want to be sorted out from all other firm types the best choice is to go first to MGI. How MGI may signal that a firm is perceived by them as a *H*-firm? We argue that MGI may offer two kinds of contract to banks. In particular, they can signal to a bank that a firm is of the *H*-type by their willingness to secure a greater amount of lending for *H*-firms compared to *M*-ones.

All in all, this implies that by allowing firms to choose the sequence of actions, MGI end up with a pool of applicants which is on average more risky compared with the case in which firms are not allowed to choose. In particular, the more banks are efficient in screening firms the lower is the quality of firms asking for a mutual loan guarantee. It may happen, that the gains due to the high screening efficiency of MGI are more than offset by this adverse selection effect.

In terms of the empirical strategy, the fact that the bank-firm-MGI matching depends on the relative screening efficiency of banks and MGI, such that the pool of firms asking for a mutual loan guarantee is biased towards

more risky borrowers, implies that if a bias eventually exists it is against the hypothesis that MGI are better able than banks at gathering information about small firms. Thus, even in the worst case, i.e. we fail to control for that, we would underestimate the effect of mutual loan guarantee on loan interest rates.

4. Data and empirical strategy

In this section we study how MGI help in mitigating the asymmetric information problems that typically characterize the credit relations between small firms and banks. In particular, we intend to verify if the interest rates applied on current account loans to firms affiliated with MGI are, other things being equal, lower than those applied to other firms. Moreover, we want to analyze the ability of the consortia to select properly affiliated firms in terms of risk.

To verify whether firms associated with a MGI obtain, other things being equal, more favorable financing conditions with respect to the other firms we focused on overdraft loans where the presence of guarantees of MGI is very limited. The analysis of this category of loan therefore allows to fully appreciating the signaling effect linked with being a member of a MGI. Moreover, as underlined by Berger and Udell (1995) and by Chakraborty and Hu (2006), the asymmetric information problems are more relevant for overdraft loans that, because of their nature, are less influenced by the particular projects financed.

The sample is constituted of all the small enterprises (artisan firms and other firms with less than 20 employees) that, on the basis of the data in the Italian Credit Register, had a loan in June 2005[7]. Interest rates applied to the

[7] The firms affiliated with MGIs typically have less than 250 employees. The universe of the artisan firms and of the other small enterprises (with less than 20 employees) represents the category closer to

overdraft loans have been obtained from the analytical survey on interest rates. Our analysis will focus therefore on those firms included in the Italian Credit Register borrowing from banks participating in the Survey on loan interest rates. The final sample is given by 263,000 small firms, of which 46,000 (17 per cent) had a guarantee given by MGI. The MGI considered in the analysis are 600 after trimming some data for lack of observations.

The econometric analysis has been performed by means of the following equation:

$$r_{ih} = \alpha + \beta_1 MLGC_i + \beta_2 South_i + \beta_3 Art_i + \beta_4 Size_i + \sum_{j=1}^{N_j} \gamma_j Sector_{ji} + \sum_{h=1}^{N_h} \delta_h Bank_h + \beta_5 Mono_i + \beta_6 Garov_{ih} + \beta_7 Gartot_{ih} + \varepsilon_{ih} \quad (1)$$

where $i = 1,\ldots,N_i$ represents the firm, $h = 1,\ldots,N_h$ indicates the bank, $j = 1,\ldots,N_j$ is the economic activity sector.

The interest rate applied to the *i-th* firm on the overdraft loan given by the bank *h-th* net of the commissions (r_{ih}), depends both on the firm and the bank characteristics. The characteristics of the firm are the affiliation with a Mutual Loan Guarantee Consortium (dummy *MGI*), the geographic location (dummy *South*), the registration in the artisan firms register (dummy *Art*), the firm size (the log of the loan, *Size*), the economic activity sector (dummy *Sector*).

A fixed effect $Bank_h$ accounts for the characteristics of the supply of credit of every intermediary. Among the other explanatory variables, the dummy $Mono_i$ denotes if the i-th firm has a credit relation only with the *h*-th bank, the dummy $Garov_{ih}$ takes into consideration the presence of real guarantees on the

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that of the firms affiliated with a MGI. The classification by customer economic activity sector allows actually to distinguish between firms with less than 20 employees and with more than 20 employees.

examined overdraft loan[8] and the dummy *Gartot* denotes if the financing bank receives any guarantee (personal or real) in front of the total loans given to a particular firm. The latter variable allows controlling, on the one hand, for non observable characteristics of the firm (see Coco, 2000) and, on the other hand, for possible effects of a cross-subsidization between the guarantees given on different categories of financing. In case of bankruptcy, actually the guarantees for a mortgage loan could, for example raise the recovery rate of the overdraft loans if their value exceeds that of the loan to which are specifically attached.

5. Results

5.1 The effects of MGI on loan interest rates

Results are reported in Table 3. The $\beta 1$ coefficient in the first column indicates that, coeteris paribus, firms guaranteed by MGIs obtain interest rates lower by almost 0.2 percentage points.

The other regressors show the expected signs. The financing cost is negatively correlated with the size of the firm. Small enterprises are typically more opaque (often the assets of the family owning the firm are not easily distinguished from the assets of the firm, moreover balance sheets are not very detailed) and this leads to a higher credit risk reflected in the interest rate.

The financing cost is higher for the firms with loans only from one bank, in line with the theoretical contributions that show that closer relations between bank and firm may be associated with information rents (Sharpe, 1990; Rajan, 1992). The existence of real guarantees eases the recovery of the credit in case

[8] The only guarantees that may be attached to an overdraft loan are the real ones. In our sample we find those guarantees only in 5 per cent of the observations. Personal guarantees, typically given on

of insolvency and is therefore associated with an interest rate lower by around one per cent. The positive sign of the coefficient of the dummy *Gartot* is coherent with the hypothesis that banks ask riskier firms for more guarantees (Berger and Udell, 1990 and 1995). Finally, artisan firms pay 3 basis points more than the other firms.

Results imply moreover that the small Southern firms pay on average a higher interest rate with respect to the firms in the rest of Italy (the difference is equal to 25 basis points) coherently with other empirical works (Panetta, 2003).

This latter result, however, does not allow ascertaining if in Southern Italy there are systematic differences between firms members of a MGI and the others.

The robustness of these results has been checked in a number of ways.

a) *Additional controls for firm riskiness and bank entry*

In the second column of Table 3 we report the estimates obtained by adding three additional controls: two for the riskiness of the firm and one for the pricing policy of the bank. The coefficient for MGI is almost unaffected.

The dummy *Over* and the dummy *Bad*, indicate, respectively, that the loan is classified as overdue or bad from at least one of the banks lending to the firm. The coefficients indicate that, as expected, interest rates are on average higher (of 1.6 and 1.9 percentage points respectively). The dummy *Entry* indicating that the *h*-th bank has opened its first branch in the province where the firm has the legal head-quarter since less than three years. This variable is meant to verify if the results are somehow affected by specific pricing policies adopted from the banks in the areas of new location. The

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the total of the loans, may not be linked to a specific loan category. The fidejussion guarantees, even if

results indicate that, other things being equal, banks apply interest rates on average lower by 0.2 percentage points in the provinces of new location. This more aggressive pricing policy nevertheless, as well as the two controls for the riskiness of the firm, does not modify the other results.

b) *Banks operating with at least a MGI*

In the third column of Table 3, we restricted our sample only to the banks which have an operating relationship with a MGI. The rationale for this test is that some firms may have relationships only with banks which do not operate with any MGI. If these firms are, for some reasons, riskier than average then our previous results may be biased. However, even after having restricted our sample to banks operating with a MGI we do not detect any significant changes in our previous results.

c) *Multiple lending and firm fixed effects*

In the fourth column of Table 3 we have verified if the results are still valid also considering only firms that borrowed from more than one bank. The results, that employ a halved number of observations, to 150,000, do not evidence relevant differences. Apart from that, since we are taking into account only firms borrowing from more than one bank, these sub-sample allows to introduce firm fixed effects. Results are reported in the fifth column of Table 3. Again the coefficient for MGI is negative. It is also interesting to note that the estimated effect of mutual loan guarantees is stronger when firm fixed effects are used. This is due to the fact that in this way we control for both observable and unobservable characteristics of firms. Our result seems to support the hypothesis reported in Section 3 that, on average, the pool of applicants for a mutual loan guarantee is made of riskier firms compared to the whole population of firms.

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not referred to the overdraft loan, are nonetheless controlled for with the dummy *Gartot*.

d) *Geographical fixed effects*

In Table 4 we have controlled for the possible presence of specific geographical effects. In this way we aim at controlling for provincial effects that could affect both banks' interest rate setting and MGI affiliation but are not related to a MGI informational effect. The main results stay unchanged. We also have estimated equation (2) of Table 3 by adding fixed provincial effects without detecting any important changes in the variable of interest.

e) *Cooperative banks*

Among banks, cooperative banks are those intermediaries whose characteristics resemble the most those of MGI. These banks are very small, their geographical reach is typically limited to few close towns and they lend mostly to their members. Thus, cooperative banks seem to be a close substitute for mutual loan guarantee since it is quite unreasonable that they are less able than MGI at screening and monitoring borrowers. Despite this we observe that even cooperative banks operate with MGI. The reasons for that may be quite different compared to other banks. In this case, cooperative bank might be just buying credit risk protection for those borrowers they know they are highly risky.

The results in Table 5 show that affiliation to a MGI guarantee for firms borrowing from cooperative banks raises the interest rate paid. This is in line with the intuition provided in Section 2: if a bank has an accurate screening technology firms asking for a mutual loan guarantee come from a pool of applicants of an overall lower quality.

Also, these results support the view that the reason for a mutual loan guarantee lowering interest rates is linked to a better ability of MGI at dealing with asymmetric information problems.

f) *An alternative estimation methodology*

Table 6 reports the results obtained by using a treatment effect model, where the selection equation for the decision of the firm to join a MGI includes social capital endowments as proxied by the number of blood donations per inhabitant, the extent of the black economy, to proxy for the lack of social trust, being part of the artisan, retail or building sectors in which the presence of small firms and hence of MGI is higher. We also include a specific control for those firms that have received some financial aid from central or local governments (*State*).

Both the first column for the baseline model and the second one for the more complete model with additional controls for risk, show that results are pretty robust.

The results shown in the selection equation are also interesting. The probability for a firm to be backed by a mutual loan guarantee increases with the social capital endowment of the province where the firm is headquartered, while it is negatively correlated with the size of the black economy. A higher probability is also observed for those firms which obtain financial aid from the central or local governments. This may capture the fact that MGI supply technical support and advice to firms that apply for financial public aid.

5.2 Deeper into the effects of MGIs characteristics on loan interest rates

To fully bring into the picture the role of *peer-monitoring* in MGIs we have tried to insulate the effect of the MGI size and the role of external funds provided by public or semi-public bodies (see Table 7).

To perform this test we have restricted our sample to those firms backed by a mutual loan guarantee. As a consequence, in order to get unbiased estimates, we have to model the affiliation choice. To this aim we

use the Heckman procedure by modeling the sample selection in the same way as we did for the treatment estimation before.

Intuitively, a larger group size tends to increase peer monitoring effectiveness but until a certain point because a higher number of firms in the MGI also increases the scope for free riding in debt-repayment decisions. Therefore we expect that an increase in the number of firms in a MGI will initially determine a lower interest rates since the bank is better insured against individual defaults; however at a certain point, when the number of borrowers in the group increases too much, the free riding problem should overcome the benefits of peer monitoring coming from additional firms and the interest rate should start to rise.

Table 7 shows this test using a model that includes the MGI size both in linear (*Firms*) and quadratic form ($Firms^2$). From the estimated coefficients it is possible to analyze the relationship between the number of firms associated to a MGI and the interest rate paid on average by an affiliated firm. Figure 2 shows this relationship over the entire range of the number of firms observed in our sample (from a minimum of nearly zero to a maximum of 21.200 firms in a single MGI). The interest rate initially declines, because of the positive effect of peer-monitoring, reaching a minimum value when the number of firms in a MGI is around 8,500. Beyond this threshold the interest rate paid by affiliated firms starts increasing and the benefit to be part of a MGI vanishes when the consortium has a number of participants that is equal to 17,000.

In order to evaluate the role of external funds provided by public or semi-public bodies we have also inserted in the specification reported in Table 7 a dummy variable that takes the value of one if financial support is provided to the MGI by local and national government authority. As discussed above, public funds may both improve or deteriorate the informational efficiency for MGI. On one hand, public funds raise a typical problem of moral hazard. On

the other, it could also be the case that the presence of public funds into the MGI may convey a positive signal to the lender about the capacity of the MGI of attracting more external funds that may be used as additional collateral and reduce the risk incurred by a private lender. The result reported in table 7 shows that the moral hazard effect prevails and 13 additional basis points are paid on interest rates, other things being equal, by firms that are affiliated to a "public MGI". This means that the positive signaling effect for a MGI of having public funds is compensated by the negative effect given by a relaxation of the selection criteria.

5.3 Are small firms affiliated to a MGI less risky?

The analysis presented in the previous section shows that firms which are affiliated to a MGI obtain significant gains on their financing conditions. The evidence provided so far, however, does not explain explicitly if such gains come from a lower riskiness of these firms. In this section, therefore, we aim at verifying this hypothesis directly, by means of the probability that a small firm belonging to a MGI has to go into default.

The sample is composed by around 385,000 small firms, of which more than 50,000 had a guarantee given by MGIs[9]. Table 8 highlights a remarkable difference in the ratio between bad loans and lending among firms in the two Italian areas; in June 2005 the ratio was equal to 7 per cent in Central and Northern Italy and 23 per cent for the Southern firms[10]. However, the difference in the quality of bank lending between the two Italian areas drops drastically when we limit our observation only to firms

[9] The number of firms used in this execise is greater than that used in the previous section because the analytical survey on interest rates used in section 5 gathers information only from a sub-sample of Italian banks.

[10] These ratios are very similar to those calculated for all small firms in the two areas (6 and 19 per cent, respectively) confirming the reliability of the sample used in our econometric analysis.

which are affiliated to a MGI; in this case the ratio is equal to 4 per cent in the Centre and in the North and 6 per cent in the Mezzogiorno.

The analysis of the ratio between bad loans and lending is not sufficient however to establish if firms which are affiliated to a MGI are on average less risky. The low ratio is very likely influenced also by the fact that banks obtain directly from the MGI a substantial coverage of losses in the case of defaults and this mechanically reduces the amount of their credit portfolio that is considered "bad". In other words, bad loans may be lower in the case of a firm affiliated to a MGI just because of the direct use of the guarantee fund. On the base of the data provided by Fedart-Fidi, in the occurrence of a firm's default in more than 50 per cent of the cases banks proceed with an immediate action to obtain the guarantee funds: this determines an immediate reduction in the volume of bad loans. In one quarter of the cases the bank may set aside on their pledge account the guaranteed share; in the remaining cases the excussion occurs at the end of the legal procedure. In all cases, time to recovery of credit positions is greatly reduced and this determines a low ratio between bad debt and total lending.

In order to evaluate if firms associated with a MGI are, other things being equal, less risky with respect to other small firms, we estimate the probability that a unit of lending is classified as bad loans taking into account firm-specific characteristics: affiliation with a MGI, geographic position, application to the register for artisan companies, firm's dimension, sector of economic activity.

In particular, the econometric analysis has been carried out using the following probit model that evaluate the probability that the i-th firm is classified in default from at least one of the banks that grant it credit (Pr(soff = 1)).

(2)

$$\Pr_i(baddebt=1) = \Phi(\delta_0 + \delta_1 MLGC_i + \delta_2 South_i + \delta_3 Art_i + \delta_4 Size_i + \delta_5 Mono_i + \sum_{j=1}^{Nj} \eta_j Sector_{ji})$$

Results reported in Table 9 show that, *coeteris paribus*, small firms affiliated to a MGI have a probability to go into default of 5 per cent less with respect to other companies with the same characteristics.

All other explanatory variables have the predicted signs. For firms borrowing from only one bank default probability drops of 11 percentage points; this evidence is coherent with the hypothesis of a higher quality of screening and monitoring activity by intermediaries that are engaged in strict lending relationship (Petersen and Rajan, 1994) and their greater propensity to debt restructuring (Berglof and Von Thadden, 1994; Bolton and Scharfstein, 1990). The probability that a unit of loan of a Southern firm is classified as a bad debt is 13 percentage points higher than for other companies in the sample; it is significantly lower for big firms.

The second column of Table 9 reports a different specification that considers as additional explanatory variable the interaction term (δ_6*MGI*South). Results show that affiliation to a MGI for a Southern firm can be associated to a probability to be classified as bad debt that is lower of around 11 percentage points ($\delta_1+\delta_6$ = -0.111). This probability is higher of one percentage points for small Southern firms that have business relationship with only one bank, while it is lower of 5 percentage points if these firms are affiliated to a MGI.

These results may depend upon the fact that banks that operate with MGI have specific characteristics. For example, such banks may have a greater attitude toward renegotiation of debt with respect to other intermediaries determining a lower number of bad loans. To verify the reliability of previous results we have integrated our probit specification with dummies that capture specific aspects relative to each bank. Results confirm that the existence of group lending has positive effect on credit quality even though effects are slightly reduced.

In order to corroborate these results the analysis has been repeated to estimate the default probability of firms which are affiliated to a MGI. In particular, the estimation model used above has been adapted in order to explain the probability that a firm is declared in default over the period June 2004 - June 2005 (Table 10). This test is particularly interesting because the affiliation to a MGI may reduce statistically the volume of bad loans simply because a significant part of the credit position is repaid. Although, considering the fact that excussion is generally equal to 50 per cent of the value of the loan, it is unlikely that the total position is taken away from the credit register in a year. In this way it is possible to overcome the problems that we have in estimating the probability that a unit of loan is into default. The analysis confirms previous results. In particular, the probability that a small firm goes into default is reduced by around one percentage point in case of affiliation in group-lending. The reduction increased to 3 per cent if the firm has his legal headquarter in the South. Even in this case the introduction of bank-fixed effects, that capture different attitude among intermediaries towards debt restructuring, does not modify the results of the analysis.

Tables and figures

Table 1

MUTUAL GUARANTEE INSTITUTIONS (MGIs) ACTIVITY IN ITALY IN 2004 (1)

(millions euro, percentage values)

Federations	Sector	Number of affiliated MLGCs (a)	Number of affiliated SMEs (b)	Number of SMEs for MLGC (b)/(a)	Guaranteed lending	Short term	Medium and long term	Capital / guarantees (2)	Guarantees (2)	Monetary fund	Personal guarantees
Fedart-Fidi	Crafts	314	667,482	2,126	8,494	38.0	62.0	15.7	4,022	80.0	20.0
Federconfidi	Industry	74	46,901	634	7,140	31.1	68.9	4.4	752	73.3	26.7
Fincredit	Industry	25	34,561	1,382	1,809	….	….	17.6	1,013	….	….
Federascomfidi	Commerce, Service and Tourism	67	174,052	2,598	3,100	27.7	72.3	13.0	1,368	90.0	10.0
Federfidi	Commerce, Service and Tourism	34	70,000	2,059	….	….	….	….	640	….	….
Total of the 5 Federations		514	992,996	1,932	20,543	33.7	66.3	12.6	7,795	81.4	18.6
Total Italy (3)		1,073									

(1) Data are supplied by each Federation. - (2) As for Fedart-Fidi data refers to 208 MLGCs taking part to a special survey. - (3) Data have been provided by Italian Foreign Exchange Office.

Table 2

BANKS WITH AGREEMENTS IN PLACE WITH MUTUAL GUARANTEE INSTITUTIONS (MGIs)[1]

	Big banks (2)	Medium banks (2)	Small banks (2)	Cooperative banks	Total
Number of banks with agreements in place with MLGCs: (a)	17	24	355	260	396
Number of active banks (foreign branches excluded): (b)	22	33	665	440	720
*- as % of size category: (a)/(b)*100*	*77.3*	*72.7*	*53.4*	*59.1*	*55.0*
*- as % of total (a)/396*100*	*4.3*	*6.1*	*89.6*	*65.7*	*100.0*
Number of MLGCs in Credit Registry	365	281	512	278	600
- as % of total MLGCs in credit Registry	*60.8*	*46.8*	*85.3*	*46.3*	*100.0*
Number of firms assisted and with loans guaranteed by MLGCs: (c)	18,857	12,776	27,198	9,446	58,831
Total number of firms with granted loans: (d)	180,528	94,310	205,644	78,043	480,482
*- as % of firms assisted and with granted loans by MLGCs: (c)/(d)*100*	*10.4*	*13.5*	*13.2*	*12.1*	*12.2*
- as % of total: (c)/58.831	*32.1*	*21.7*	*46.2*	*16.1*	*100.0*
Percentage of the overall credit to SMEs guaranteed by MLGCs	*8.3*	*13.5*	*13.2*	*12.1*	*9.3*

Sources: Credit Registry and Italian Foreign Exchange Office.

(1) Guarantees granted to craftsman firms and to other firms with less than 20 employees.

(2) Banks are classified by size of total assets: of more than 20 billions euro for large banks, between 20 and 7 billions for medium banks, of less than 7 billions for small banks.

Table 3

MGI AND BANKS' INTEREST RATE SETTING

The dependent variable is the interest rate on overdraft loans for firms with less than 20 employees and for artisan firms. OLS estimates with fixed effects for economic activity sector and for lending bank. Fixed effects are not reported. Standard errors with white correction are in italics. *** 1 per cent significance. ** 5 per cent. * 10 per cent.

Explicative variables	(1) Benchmark equation	(2) Additional controls for risk (firms temporarily distressed or bankrupt) and for entry of a bank in the province where the firm is located	(3) Only banks with an operating relationship with at least a MLGC	(4) Only firms with lending from more than one bank	(5) Only firms with lending from more than one bank and fixed effects for every firm
firm guaranteed from a MLGC (*MLGC*)	-0.181 ***	-0.198 ***	-0.190 ***	-0.209 ***	-0.361 ***
	0.011	*0.011*	*0.011*	*0.020*	*0.021*
Southern Italy firm (*South*)	0.253 ***	0.225 ***	0.191 ***	0.141 ***	
	0.016	*0.016*	*0.016*	*0.022*	
artisan firm (*Art*)	0.031 ***	0.034 ***	0.039 ***	0.035 **	
	0.012	*0.012*	*0.012*	*0.017*	
log of loan used (*Size*)	-0.086 ***	-0.100 ***	-0.101 ***	-0.139 ***	
	0.005	*0.005*	*0.005*	*0.008*	
firm borrowing from only one bank (*Mono*)	0.373 ***	0.391 ***	0.387 ***		
	0.009	*0.009*	*0.009*		
real guarantees on overdraft loan (*Garov*)	-1.304 ***	-1.368 ***	-1.354 ***	-0.696 ***	-1.196 ***
	0.019	*0.019*	*0.019*	*0.029*	*0.033*
existence of any type of guarantee on other credit lines (*Gartot*)	0.982 ***	0.977 ***	0.973 ***	0.428 ***	0.205 ***
	0.010	*0.009*	*0.100*	*0.018*	*0.032*
overdue loan (*Over*)		1.579 ***	1.590 ***	1.579 ***	
		0.021	*0.021*	*0.026*	
bad loan (*Bad*)		1.921 ***	1.925 ***	2.139 ***	
		0.039	*0.040*	*0.073*	
bank with a branch in the province where the firm is located since less than 3 years (*Entry*)		-0.177 ***	-0.222 ***	-0.222 ***	-0.205 **
		0.022	*0.023*	*0.031*	*0.018*
costant (α)	10.298 ***	10.439 ***	10.439 ***	10.828	9.261 ***
	2.490	*2.461*	*2.461*	*8,195*	*0.037*
adjusted R^2	0.205	0.223	0.224	0.196	0.146
Number of observations	347,461	347,461	336,724	149,837	149,837

MODELS WITH GEOGRAPHICAL CONTROLS: FIXED PROVINCIAL DUMMIES

The dependent variable is the interest rate on overdraft loans for firms with less than 20 employees and for artisan firms. OLS estimates with fixed effects for province, economic activity sector and for lending bank. Fixed effects are not reported. Standard errors with white correction are in italics. *** 1 per cent significance. ** 5 per cent. * 10 per cent.

Explicative variables	(1) Benchmark equation	(2) Additional controls for risk (firms temporarily distressed or bankrupt) and for entry of a bank in the province where the firm is located
firm guaranteed from a MLGC (*MLGC*)	-0.118 ***	-0.138 ***
	0.011	*0.011*
artisan firm (*Art*)	0.081 ***	0.083 ***
	0.012	*0.012*
log of loan used (*Size*)	-0.091 ***	-0.106 ***
	0.051	*0.005*
firm borrowing from only one bank (*Mono*)	0.035 ***	0.374 ***
	0.009	*0.009*
real guarantees on overdraft loan (*Garov*)	-1.362 ***	-1.424 ***
	0.021	*0.020*
existence of any type of guarantee on other credit lines (*Gartot*)	0.971 ***	0.967 ***
	0.010	*0.010*
overdue loan (*Over*)		1.581 ***
		0.019
bad loan (*Bad*)		1.874 ***
		0.039
bank with a branch in the province where the firm is located since less than 3 years		-0.076 ***
		0.023
adjusted R^2	0.231	0.249
Number of observations	347,420	347,420

IN THE PRESENCE OF SMALL BANKS THE EFFECTS OF MGIS DISAPPEAR

Sample composed of cooperative banks only. The dependent variable is the interest rate on overdraft loans for firms with less than 20 employees and for artisan firms. OLS estimates with fixed effects for economic activity sector and for lending bank. Fixed effects are not reported. Standard errors with white correction are in italics. *** 1 per cent significance. ** 5 per cent. * 10 per cent.

Explicative variables	(1) Benchmark equation	(2) Additional controls for risk (firms temporarily distressed or bankrupt) and for entry of a bank in the province where the firm is located	(3) Only firms with lending from more than one bank	(4) Only banks with an operating relationship with at least a MLGC
firm guaranteed from a MLGC (*MLGC*)	0.165 ***	0.116 ***	0.276 ***	0.135 ***
	0.037	*0.037*	*0.046*	*0.037*
Southern Italy firm (*South*)	-0.448 ***	-0.508 ***	0.200	-1.131 ***
	0.143	*0.141*	*0.272*	*0.161*
artisan firm (*Art*)	0.045	0.043	0.043 ***	0.057
	0.041	*0.040*	*0.060*	*0.408*
log of loan used (*Size*)	-0.152 ***	-0.159 ***	-0.224 ***	-0.163 ***
	0.015	*0.014*	*0.025*	*0.014*
firm borrowing from only one bank (*Mono*)	0.265 ***	0.297 ***		0.299 ***
	0.030	*0.029*		*0.030*
real guarantees on overdraft loan (*Garov*)	-1.657 ***	-1.762 ***	-0.951 ***	-1.741 ***
	0.054	*0.054*	*0.082*	*0.054*
existence of any type of guarantee on other credit lines (*Gartot*)	1.018 ***	0.976 ***	0.381 ***	0.971 ***
	0.030	*0.029*	*0.053*	*0.030*
overdue loan (*Over*)		1.507 ***	1.407 ***	1.513 ***
		0.063	*0.083*	*0.063*
bad loan (*Bad*)		1.927 ***	2.397 ***	1.839 ***
		0.164	*0.339*	*0.167*
bank with a branch in the province where the firm is located since less than 3 years (*Entry*)		-0.097	-0.119	-0.067
		0.097	*0.127*	*0.100*
costant (α)	8.560 ***	8.652 ***	5.885 ***	9.902 ***
	2.082	*2.055*	*1.901*	*2.055*
adjusted R^2	0.303	0.322	0.288	0.325
Number of observations	25,721	25,721	9,468	25,295

Table 6

MODELS TO TACKLE SELECTION BIAS: TREATMENT EFFECTS

The dependent variable is the interest rate on overdraft loans for firms with less than 20 employees and for artisan firms. Maximum likelihood estimates of a treatment effects model with fixed effects for economic activity sector and for lending bank. Standard errors with white correction are in italics. *** 1 per cent significance. ** 5 per cent. * 10 per cent.

Explicative variables	(1) Benchmark equation	(2) Additional controls for risk (firms temporarily distressed or bankrupt) and for entry of a bank in the province where the firm is located
firm guaranteed from a MLGC (*MLGC*)	-0.622 ***	-0.551 ***
	0.071	*0.071*
Southern Italy firm (*South*)	0.171 ***	0.153 **
	0.018	*0.018*
artisan firm (*Art*)	0.081 ***	0.073 ***
	0.019	*0.019*
log of loan used (*Size*)	-0.067 ***	-0.083 ***
	0.006	*0.006*
firm borrowing from only one bank (*Mono*)	0.405 ***	0.417 ***
	0.012	*0.012*
real guarantees on overdraft loan (*Garov*)	-1.279 ***	-1.326 ***
	0.024	*0.023*
existence of any type of guarantee on other credit lines (*Gartot*)	0.951 ***	0.954 ***
	0.012	*0.012*
overdue loan (*Over*)		1.523 ***
		0.026
bad loan (*Bad*)		1.902 ***
		0.048
bank with a branch in the province where the firm is located since less than 3 years (*Entry*)		-0.224 ***
		0.026
costant (α)	10.191 ***	10.331 ***
	2.550	*2.521*
selection equation for MLGC		
blood donations *(Blood)*	0.006 ***	0.006 ***
	0.001	*0.001*
black economy *(black)*	-0.026 ***	-0.026 ***
	0.001	*0.001*
artisan firm (*Art*)	0.569 ***	0.569 ***
	0.006	*0.006*
retail sector firm *(Retail)*	0.047 ***	0.047 ***
	0.007	*0.007*
building sector firm *(Building)*	-0.118 ***	-0.118 ***
	0.009	*0.009*
State support *(State)*	1.228 ***	1.230 ***
	0.023	*0.023*
Rho	0.092 ***	0.074 ***
	0.015	*0.016*
Wald Chi^2	39,684	45,616
Number of observations	230,492	230,492

TESTS ON THE PEER MONITORING EFFECT: GROUP SIZE AND PUBLIC MGIS

The dependent variable is the interest rate on overdraft loans for firms with less than 20 employees and for artisan firms. Maximum likelihood estimates of an Heckman model with fixed effects for economic activity sector and for lending bank. Standard errors with white correction are in italics. *** 1 per cent significance. ** 5 per cent. * 10 per cent.

Explicative variables	(1) Benchmark equation
Southern Italy firm (*South*)	-0.284 *** *0.066*
artisan firm (*Art*)	-0.025 *0.042*
log of loan used (*Size*)	-0.033 * *0.017*
firm borrowing from only one bank (*Mono*)	0.249 *** *0.027*
real guarantees on overdraft loan (*Garov*)	-0.437 *** *0.057*
existence of any type of guarantee on other credit lines (*Gartot*)	0.465 *** *0.030*
overdue loan (*Over*)	1.507 *** *0.053*
bad loan (*Bad*)	2.103 *** *0.108*
bank with a branch in the province where the firm is located since less than 3 years (*Entry*)	-0.268 *** *0.058*
thousands of firms in MLGC (*Firms)*	-0.153 *** *0.110*
thousands of firms in MLGC squared (*Firms squared)*	0.009 *** *0.001*
public funds in MLGC (*Public*)	0.129 *** *0.044*
costant (α)	9.763 *** *2.477*
selection equation for MLGC	
blood donations *(Blood)*	0.006 *** *0.001*
black economy *(black)*	-0.026 *** *0.001*
artisan firm (*Art*)	0.570 *** *0.006*
retail sector firm *(Retail)*	0.042 *** *0.007*
building sector firm *(Building)*	-0.121 *** *0.009*
State support *(State)*	1.243 *** *0.023*
Wald Chi^2	16,990
Number of uncensored observations	45,620

Table 8

RATIO BETWEEN BAD LOANS AND TOTAL LOANS IN JUNE 2005

(Percentage values)

	Agriculture	Manufacturing	Building	Retail	Services	Totale	Number of Firms	%
Small firms in sample								
Centre-North	4.5	7.6	8.0	8.4	4.1	6.6	308,732	80.2
South	23.9	23.3	33.2	27.3	16.3	22.9	76,401	19.8
Italy	8.1	10.2	13.0	13.4	6.3	9.8	385,133	100.0
Small firms in sample guaranteed by MLGC								
Centre-North	1.7	4.4	4.4	4.3	2.9	3.5	46,450	12.1
South	3.0	4.6	14.7	4.4	4.3	6.2	3,963	1.0
Italy	2.3	4.5	9.6	4.3	3.6	4.9	50,413	13.1
For comparison:								
Small firms total								
Centre-North	*5.0*	*7.4*	*6.8*	*7.1*	*4.5*	*6.1*	*2,957,451*	*72.8*
South	*18.1*	*21.3*	*26.6*	*18.6*	*12.5*	*19.0*	*1,102,654*	*27.2*
Italy	*8.0*	*11.1*	*11.0*	*9.1*	*5.8*	*8.7*	*4,060,105*	*100.0*

Sources: Credit Register (for small firms; not available data on loans for an amount smaller than 75,000 euro and in good standing); Italian National Institute of Statistics, Eighth general census of manufacturing and services; Supervisory statistics (for the small firms total).

Table 9

ARE SMALL FIRMS AFFILIATED TO A MGI LESS RISKY EX-POST?

The dependent variable is the probability that a firm has a bad debt with at least one of the lending banks. Probit estimates with fixed effects for economic activity sector. Marginal effects computed for a discrete variation of the dummy variables form 0 to 1. Fixed effects are not reported. Standard errors with white correction are in italics. *** 1 per cent significance. ** 5 per cent. * 10 per cent.

Explicative variables	(1) Benchmark equation	(2) Differential effects of MLGC in Southern Italy	(3) Differential effects of MLGC in Southern Italy for a firm borrowing only form one bank	(4) Bank fixed effects
firm guaranteed from a MLGC (*MLGC*)	-0.056 ***	-0.052 ***	-0.053 ***	-0.038 ***
	0.001	*0.001*	*0.001*	*0.001*
Southern Italy firm (*South*)	0.135 ***	0.138 ***	0.126 ***	0.046 ***
	0.002	*0.002*	*0.003*	*0.003*
artisan firm (*Art*)	-0.020 ***	-0.020 ***	-0.020 ***	-0.016 ***
	0.001	*0.001*	*0.001*	*0.001*
log of loan used (*Size*)	-0.017 ***	-0.017 ***	-0.017 ***	-0.019 ***
	0.001	*0.001*	*0.001*	*0.001*
firm borrowing from only one bank (*Mono*)	-0.107 ***	-0.107 ***	-0.111 ***	-0.059 ***
	0.001	*0.001*	*0.002*	*0.001*
South firm guaranteed from a MLGC (*MLGC*South*)		-0.058 ***	-0.047 ***	-0.037 ***
		0.002	*0.004*	*0.005*
South firm borrowing from only one bank (*Mono*South*)			0.011 ***	0.032 ***
			0.002	*0.003*
South firm guaranteed from a MLGC borrowing from only one bank (*Mono*South*MLGC*)			-0.053 ***	-0.041 ***
			0.006	*0.007*
Pseudo R^2	0.127	0.128	0.128	0.347
Log-likelihood	-109,453	-109,342	-109,341	-81,771
Number of observations	385,008	385,008	385,008	384,424

Table 10

ARE SMALL FIRMS AFFILIATED TO A MGI LESS PRONE TO BECOME RISKY?

The dependent variable is the probability that a firm was classified between June 2004 and June 2005 as having a bad debt with at least one of the lending banks. Probit estimates with fixed effects for economic activity sector. Marginal effects computed for a discrete variation of the dummy variables form 0 to 1. Fixed effects are not reported. Standard errors with white correction are in italics. *** 1 per cent significance. ** 5 per cent. * 10 per cent.

Explicative variables	(1) Benchmark equation	(2) Differential effects of MLGC in Southern Italy	(3) Differential effects of MLGC in Southern Italy for a firm borrowing only form one bank	(4) Bank fixed effects
firm guaranteed from a MLGC (*MLGC*)	-0.016 ***	-0.014 ***	-0.015 ***	-0.008 ***
	0.001	*0.001*	*0.001*	*0.001*
Southern Italy firm (*South*)	0.035 ***	0.036 ***	0.026 ***	0.001
	0.002	*-0.032*	*0.003*	*0.001*
artisan firm (*Art*)	-0.032 ***	-0.033 ***	-0.032 ***	-0.021 ***
	0.001	*0.001*	*0.001*	*0.001*
log of loan used (*Size*)	-0.011 ***	-0.011 ***	-0.011 ***	-0.012 ***
	0.001	*0.001*	*0.001*	*0.001*
firm borrowing from only one bank (*Mono*)	-0.046 ***	-0.046 ***	-0.051 ***	-0.029 ***
	0.001	*0.001*	*0.002*	*0.001*
South firm guaranteed from a MLGC (*MLGC*South*)		-0.021 ***	-0.016 ***	-0.008 ***
		0.002	*0.002*	*0.003*
South firm borrowing from only one bank (*Mono*South*)			0.011 ***	0.027 ***
			0.002	*0.002*
South firm guaranteed from a MLGC borrowing from only one bank (*Mono*South*MLGC*)			-0.019 ***	-0.019 ***
			0.003	*0.003*
Pseudo R^2	0.113	0.114	0.115	0.174
Log-likelihood	-60,024	-59,980	-59,935	-55,886
Number of observations	385,008	385,008	385,008	383,764

Figure 1

MUTUAL GUARANTEE INSTITUTIONS (MGI) ACTIVITY BY GEOGRAPHICAL AREAS

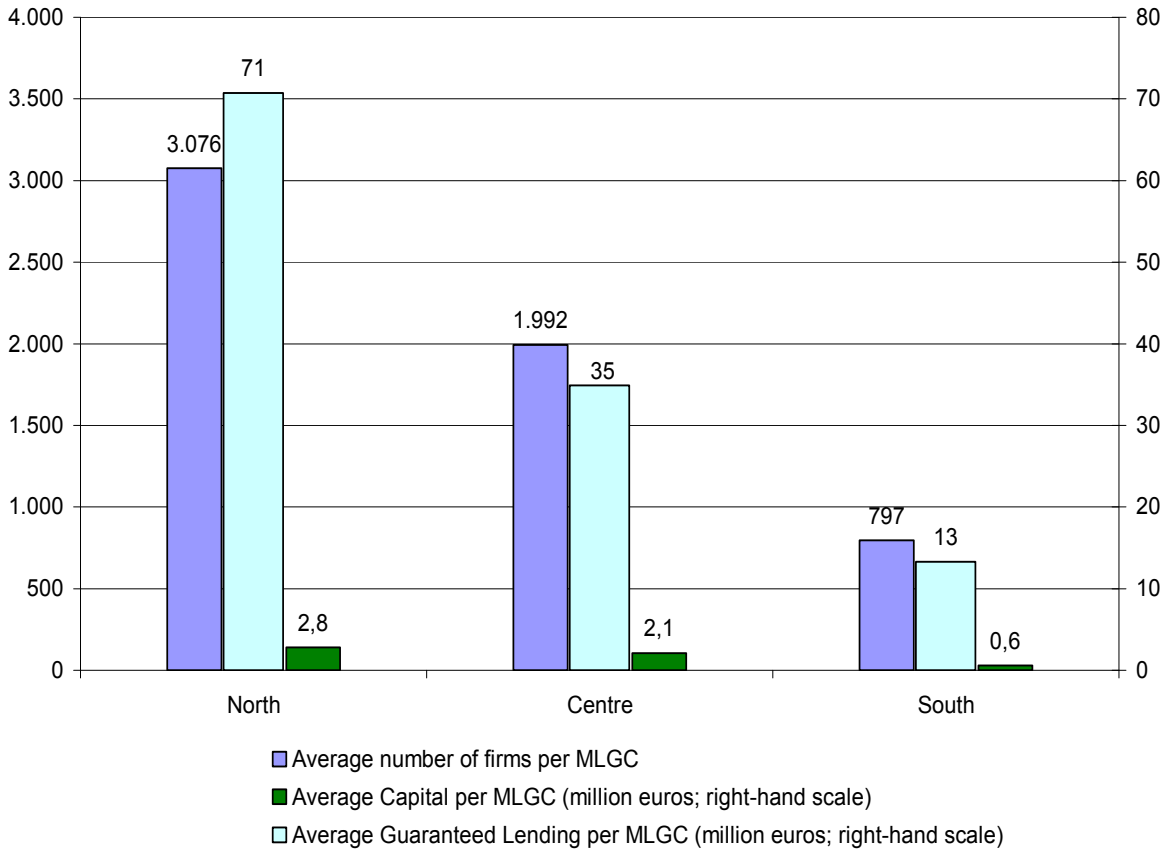
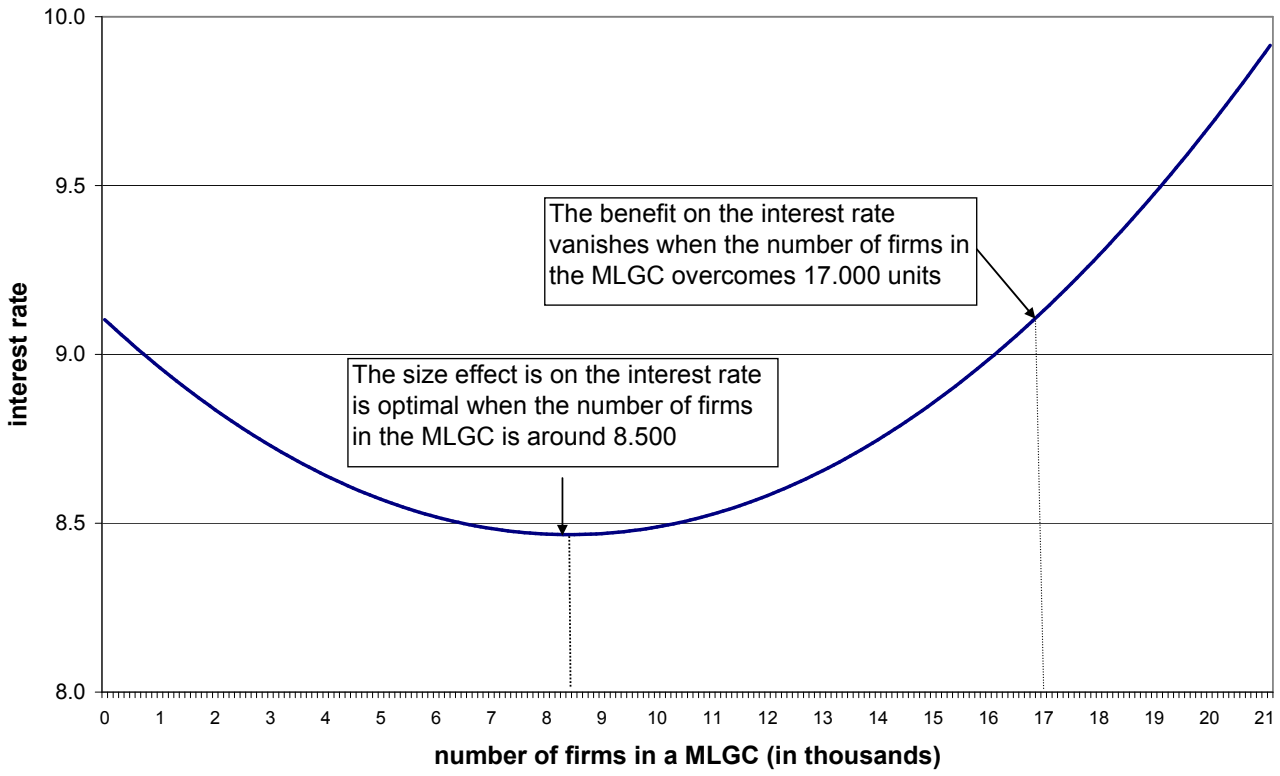


Figure 2

THE OPTIMAL NUMBER OF FIRMS IN MUTUAL GUARANTEE INSTITUTIONS



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