# MUTUAL GUARANTEE INSTITUTIONS AND SMALL BUSINESS FINANCE

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## Abstract

A large literature showed that small firms experience difficulties in accessing the credit market due to informational asymmetries; these may be mitigated by collateral or relationship lending, possibilities often precluded to small business. We investigate the effect on small business finance of an alternative contractual scheme based on group lending, the Mutual Guarantee Institution (MGI). We test whether firms affiliated to MGIs pay less for credit, due to a joint responsibility that provides affiliates with peer monitoring incentives. Hence, MGI willingness to post collateral signals firms credit-worthiness to banks. Our estimates indicate that indeed MGI affiliation improves small firms lending.

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## 1. Introduction[1]

The presence of information asymmetries between small firms and credit intermediaries is a serious problem that may reduce financing of good investment opportunities and the development of promising entrepreneurs' projects (Petersen and Rajan, 1994, Berger and Udell, 2004). Possible solutions to mitigate this problem for small enterprises are posting collateral or building close relationships with lenders. Nevertheless, these contractual devices are of little help to firms which lack collateral or credit history.

In these cases other contractual schemes may emerge to mitigate particularly severe asymmetric information problems. A relevant example is group lending (like in microfinance loans), 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 contractual device being effective in mitigating asymmetric information problems 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

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 test the effectiveness of a particular group lending scheme that is based on the role of Mutual Guarantee Institutions (MGIs). In a MGI each member contributes to a guarantee fund from which is drawn collateral posted to loans granted to MGI members. MGIs are an institutional device that put under the same responsibility a group of small firms that need bank lending but individually have a limited collateral capacity. Since members are mostly part of the same local community a *peer-monitoring* is in place and our hypothesis is that it significantly mitigates moral hazard effects.

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 (SMEs). In Italy according to the last national census of 2001 the firms with less than 50 employees were 4 millions: this country represents therefore a very good laboratory for our experiment because small firms have a great importance in the economy.

MGIs 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 SMEs affiliated to a MGI. The

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[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.

diffusion of MGIs is particularly relevant in Germany, France, Spain and Italy. Italian MGIs represent, however, the largest component of the European mutual guarantee sector, since they account for 37 per cent of the total outstanding volume of guarantees to SMEs.

MGIs intervene in the bank-firm relationship in different ways, mitigating problems of access to bank loans for SMEs 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 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.

MGIs 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. MGIs 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

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[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, other things being equal, to reduce regulatory capital on their SME loan portfolio.

dataset including loans to small businesses (i.e. firms with less than 20 employees). We verify whether MGIs 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 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 and therefore if affiliation to a MGI convey a positive signal to banks on firm's creditworthiness.

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 MGIs and whether contributions to the guarantee fund from the public sector may improve or deteriorate the information gathering incentives for MGIs. Again Italy represents an interesting laboratory to test for these effects. First, there is wide heterogeneity in MGI size. Second, not all MGIs receive contributions from local and central governments, around 10 per cent of MGIs 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 of MGIs. 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 a 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 paper is organized as follows. Section 2 presents some facts on the activity and the institutional characteristics of MGIs. Section 3 reviews the literature and discusses the effects of a group-lending technology in reducing asymmetric information problems in the bank-firm relationship. Data and the empirical strategy is reported in Section 4, while Section 5 presents the results and robustness checks. The final section summarizes the main conclusions.

## 2. Some facts on the activity of Mutual guarantee institutions

Italian MGIs 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 MGIs 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 greater 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 SMEs.

The primary activity of MGIs 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 period in which the

guarantee is used).[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.[6] Personal guarantees may also be used directly by the affiliated firms and 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.[7]

At the end of 2004, more than one half of Italian MGIs 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). MGIs 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 geographical area allows for a thorough knowledge of the local firms.

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[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] In Italy the ratio reaches typically a maximum value that goes from 10 to 20. However on the basis of the data available for a sub-sample of MGIs the effective ratio between guarantees and loans is around 3 (see Table 1) and it is linked to the pattern of past losses incurred with respect to the mutual guarantee fund. In other countries the 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 fund.

[7] 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.

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 exceeds 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 loan-to-guarantee ratio of more than 3. 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 7 and 20 billions) and to 46 per cent for small banks (those with total assets less than 7 billions).

## 3. MGI, 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. This part is very important to justify the empirical strategy described in the following section and how to interpret the existence of possible bias, if any, in the results.

As we discussed above, we argue that MGIs 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 MGIs' posting of collateral to a small firm  as a good signal of borrower's credit-worthiness, thus lowering loan interest rates.

From an empirical point of view, the comparison between loan interest rates paid by firms affiliated to a MGI 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 <u>asks first a MGI</u> for posting collateral and <u>then asks a bank for a loan</u>;

*b*)  the borrower <u>asks first a bank for a loan</u> and <u>then, if rejected, may ask a MGI</u> 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 MGI 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 MGI 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 MGI 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 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, is 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 MGI 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 *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 the bias using the empirical strategy described in the next section, we would underestimate the effect of mutual loan guarantee on loan interest rates.

## 4. Data and empirical strategy

In this section we study how MGIs 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 to firms affiliated with MGIs are lower than those applied to other firms. Moreover, we want to analyze the ability of the MGIs 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[8]. Interest rates applied to the

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[8] The classification by customer economic activity sector allows actually to distinguish between firms with less than 20 employees and with more than 20 employees. The firms affiliated with MGIs have always less than 250 employees. However, the vast majority of these firms have less than 20 employees and therefore the universe of the artisan firms and of the other small enterprises (with less than 20 employees) represents the category closer to that of the firms affiliated with a MGI.

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 a MGI. The MGIs 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 baseline equation:

(1)

$$r_{ih} = \alpha + \beta_1 MLGC_i + \beta_2 South_i + \beta_3 Art_i + \beta_4 Size_i + \sum_{j=1}^{N_j} \gamma_j Sector_{ji} +$$

$$+ \sum_{h=1}^{N_h} \delta_h Bank_h + \beta_5 Mono_i + \beta_6 Garov_{ih} + \beta_7 Gartot_{ih} + \varepsilon_{ih}$$

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 MGI (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 examined overdraft loan[9] and the dummy *Gartot* denotes if the financing

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[9] 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

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 specific real guarantees eases the recovery of the credit in case of insolvency and is therefore associated with an interest rate lower by around one per cent. On the other hand, the positive sign of the

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

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 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 the above results has been checked in a number of ways as described in the rest of this section.

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 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 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

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

the riskiness of the firm, does not modify the other results; in particular the coefficient for MGI remains around 0.2 percentage points.[10]

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, this 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 MGIa 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

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[10] In order to analyze more in depth if these results depends on the specific dataset we have used in the analysis presented above, we have performed a **different** test on the universe of the Italian firms. In particular, using a probit model and controlling for all other relevant characteristics we have also found that the affiliation of a firm to a MGI lowers the probability of a loan to go into default. We are therefore confident that the results on the advantage gained in terms of interest paid by the firms affiliated to a MGI are not due to a bias in the composition of the sample but are actually linked to the beneficial effect of the affiliation to a MGI. Estimates for the sake of brevity are not reported here but they are available from the authors upon request.

mutual loan guarantee is made of riskier firms compared to the whole population of firms.

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 the same specification described in the second column 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 MGIs 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 this 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 3: 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 (proxied by the number of blood donations per inhabitant), the extent of the black economy, to control 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 qualitatively very similar and the financial benefit on interest rates is of around 0.6 percentage points.

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 MGI. 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, in terms of number of firms, both in linear (*Firms*) and quadratic form (*Firms²*). From the estimated coefficients it is possible analyze in Figure 2 the relationship between the number of firms associated to a MGI and the interest rate paid on average by an affiliated firm. The relationship is analyzed 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 seems to prevail 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.

## 6. Conclusions

In this paper, we have investigated the effect on small business finance of a particular group lending scheme based on the role of mutual guarantee institutions. 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, 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. Third, the evidence seems supportive of a weakening of the signal given by the affiliation to a MGI when the amount of public fund available to the MGI increases, consistently with the notion that the moral hazard effect offsets part of the benefits gained with the peer monitoring.

Overall our results identify a role for MGI in easing the conditions of

access to credit for small business indicating that their very nature of consortia based on the joint liability of borrowers may bring into the picture private incentives to preserve the quality of credit aligned to the ones of lenders. The MGI therefore seem good candidates to fill the existing gap between the two extremes, on the one hand, of credit guarantee schemes exclusively funded by states and, on the other hand, of private guarantees of individual borrowers. The MGI middle position in this virtual topology of the guarantee world could be beneficial to small businesses in terms of lower interest rates and better quality of credit thanks to the exploitation of the private incentives based on the soft information available to the MGI members, therefore adding to the list of existing policy instruments a useful device to enhance small business finance.

# 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 MGI | (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 MGI (*MGI*) | -0.181 *** *0.011* | -0.198 *** *0.011* | -0.190 *** *0.011* | -0.209 *** *0.020* | -0.361 *** *0.021* |
| Southern Italy firm (*South*) | 0.253 *** *0.016* | 0.225 *** *0.016* | 0.191 *** *0.016* | 0.141 *** *0.022* | |
| artisan firm (*Art*) | 0.031 *** *0.012* | 0.034 *** *0.012* | 0.039 *** *0.012* | 0.035 ** *0.017* | |
| log of loan used (*Size*) | -0.086 *** *0.005* | -0.100 *** *0.005* | -0.101 *** *0.005* | -0.139 *** *0.008* | |
| firm borrowing from only one bank (*Mono*) | 0.373 *** *0.009* | 0.391 *** *0.009* | 0.387 *** *0.009* | | |
| real guarantees on overdraft loan (*Garov*) | -1.304 *** *0.019* | -1.368 *** *0.019* | -1.354 *** *0.019* | -0.696 *** *0.029* | -1.196 *** *0.033* |
| existence of any type of guarantee on other credit lines (*Gartot*) | 0.982 *** *0.010* | 0.977 *** *0.009* | 0.973 *** *0.100* | 0.428 *** *0.018* | 0.205 *** *0.032* |
| overdue loan (*Over*) | | 1.579 *** *0.021* | 1.590 *** *0.021* | 1.579 *** *0.026* | |
| bad loan (*Bad*) | | 1.921 *** *0.039* | 1.925 *** *0.040* | 2.139 *** *0.073* | |
| bank with a branch in the province where the firm is located since less than 3 years (*Entry*) | | -0.177 *** *0.022* | -0.222 *** *0.023* | -0.222 *** *0.031* | -0.205 ** *0.018* |
| costant ($\alpha$) | 10.298 *** *2.490* | 10.439 *** *2.461* | 10.439 *** *2.461* | 10.828 *8,195* | 9.261 *** *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 |

Table 4

# 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 MGI (*MGI*) | -0.118 *** <br> *0.011* | -0.138 *** <br> *0.011* |
| artisan firm (*Art*) | 0.081 *** <br> *0.012* | 0.083 *** <br> *0.012* |
| log of loan used (*Size*) | -0.091 *** <br> *0.051* | -0.106 *** <br> *0.005* |
| firm borrowing from only one bank (*Mono*) | 0.035 *** <br> *0.009* | 0.374 *** <br> *0.009* |
| real guarantees on overdraft loan (*Garov*) | -1.362 *** <br> *0.021* | -1.424 *** <br> *0.020* |
| existence of any type of guarantee on other credit lines (*Gartot*) | 0.971 *** <br> *0.010* | 0.967 *** <br> *0.010* |
| overdue loan (*Over*) | | 1.581 *** <br> *0.019* |
| bad loan (*Bad*) | | 1.874 *** <br> *0.039* |
| bank with a branch in the province where the firm is located since less than 3 years | | -0.076 *** <br> *0.023* |
| adjusted $R^2$ | 0.231 | 0.249 |
| Number of observations | 347,420 | 347,420 |

Table 5

# 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 MGI |
|---|---|---|---|---|
| firm guaranteed from a  MGI (MGI) | 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 ($\alpha$) | 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 ($\alpha$) | 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 |

Table 7

## 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 MGI (*Firms*) | -0.153 *** |
| | *0.110* |
| thousands of firms in MGI squared (*Firms squared*) | 0.009 *** |
| | *0.001* |
| public funds in MGI (*Public*) | 0.129 *** |
| | *0.044* |
| costant ($\alpha$) | 9.763 *** |
| | *2.477* |
| selection equation for MGI | |
| 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 |

Figure 1

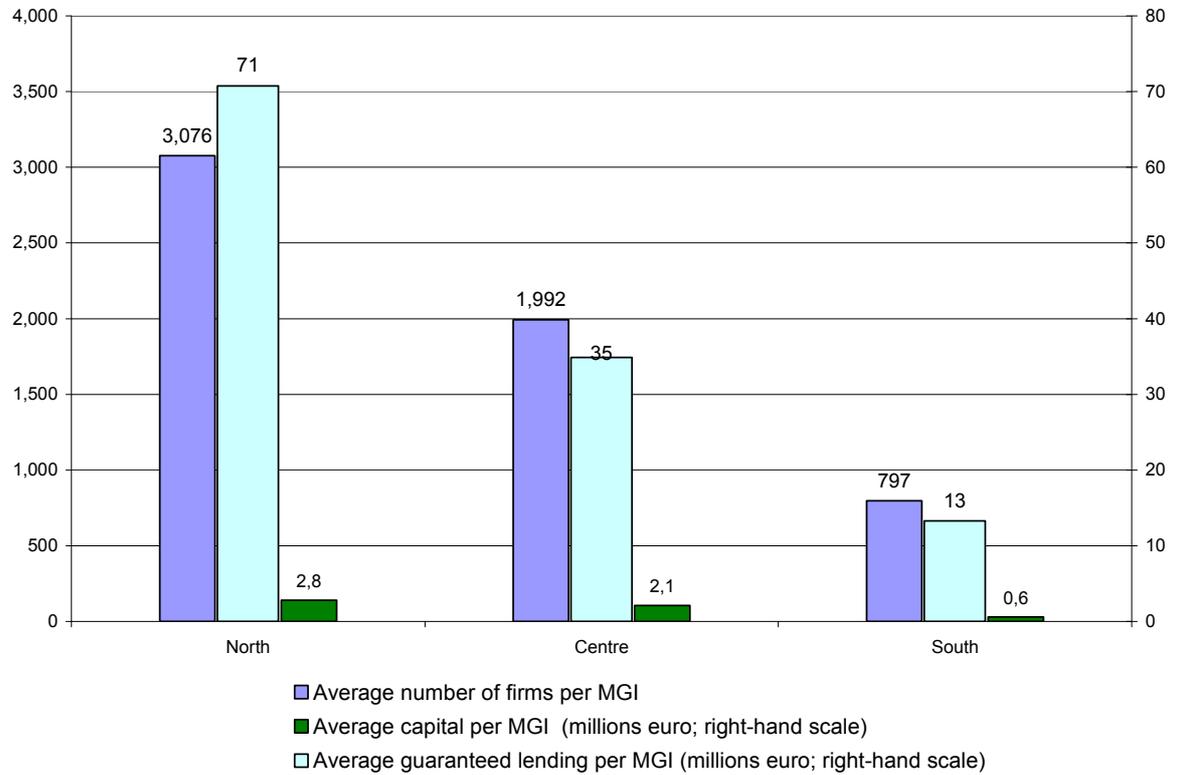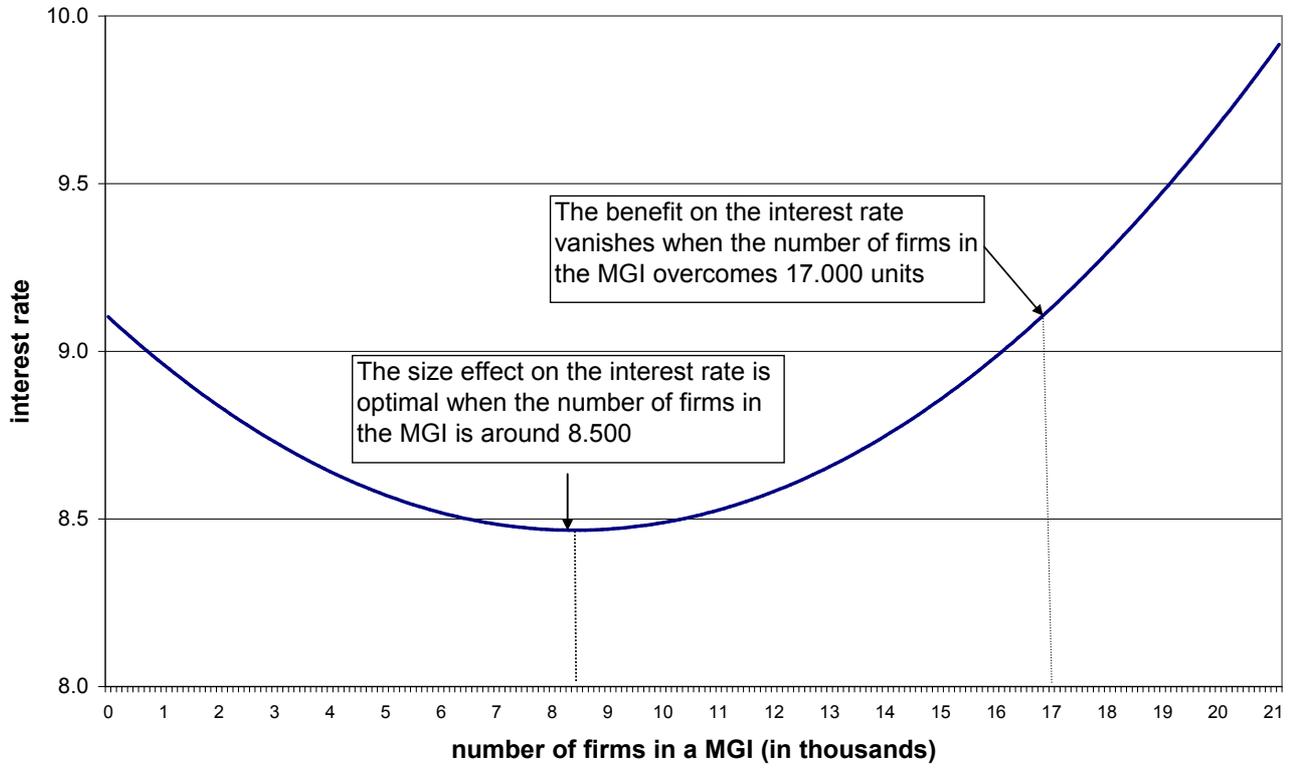**MUTUAL GUARANTEE INSTITUTIONS (MGI) ACTIVITY BY GEOGRAPHICAL AREAS**



■ Average number of firms per MGI
■ Average capital per MGI  (millions euro; right-hand scale)
□ Average guaranteed lending per MGI (millions euro; right-hand scale)

Figure 2

**THE OPTIMAL NUMBER OF FIRMS IN MUTUAL GUARANTEE INSTITUTIONS**

The benefit on the interest rate vanishes when the number of firms in the MGI overcomes 17.000 units

The size effect on the interest rate is optimal when the number of firms in the MGI is around 8.500

# References

Armendáriz B. (1999), "On the Design of a Credit Agreement with Peer Monitoring", *Journal of Development Economics*, Vol. 60, pp.79-104.

Armendáriz B. and Morduch J. (2005), "The Economics of Microfinance", The MIT Press.

Banerjee A., Besley T. and Guinnane T. (1994), "Thy Neighbor's Keeper: the Design of a Credit Cooperative with Theory and Test", *Quarterly Journal of Economics*, Vol. 109, No. 2, pp. 491–515.

Barca F. (1997), *Storia del Capitalismo Italiano dal Dopoguerra a Oggi*. Donzelli, Roma.

Bentivogli C., Catapano V., Tarantola A.M. and Tidu A. (2006), "Il sistema dei confidi Emiliano-Romagnolo: evoluzione alla luce del nuovo Accordo sul capitale", *Banca Impresa e Società*, forthcoming.

Berger A.N. and Udell G.F. (1990), "Collateral, Loan Quality, and Bank Risk", *Journal of Monetary Economics*, Vol. 25, pp. 21-24.

Berger A.N. and Udell G.F. (1995), "Relationship Lending and Lines of Credit in Small Firms Finance", *Journal of Business*, Vol. 68, pp. 351-381.

Berger A.N. and Udell G.F. (2004) "A More Complete Conceptual Framework for SME Finance", mimeo.

Berglof E. and Von Thadden E.L. (1994), "Short-Term versus Long-Term Interests: Capital Structure with Multiple Investors", *Quarterly Journal of Economics*, Vol. 109, pp. 1055-1084.

Besley T. and Coate S. (1995), "Group Lending, Repayment Incentives and Social Collateral", *Journal of Development Economics*, Vol. 46, No. 1, pp. 1–18.

Bolton P. and Scharfstein D. (1996), "Optimal Debt Structure and the Number of Creditors", *Journal of Political Economy*, Vol. 104, 1-25.

Casolaro L., Gambacorta L. and Guiso L. (2005), "Regulation, formal and informal enforcement and the development of the household loan market. Lessons from Italy", in Bertola G., Grant C. and Disney R. (eds.), *The Economics of Consumer Credit: European Experience and Lessons from the US*, MIT Press.

Cervone E. (2007) "Il ruolo dei confidi tra tradizione e cambiamento", *Diritto della Banca e del Mercato Finanziario*, forthcoming.

Chakraborty A. and Hu C.X. (2006), "Lending relationships in line-of-credit and nonline-of-credit loans: Evidence from collateral use in small business", *Journal of Financial Intermediation*, Vol. 15, pp. 86–107.

Coco G. (2000), "On the Use of Collateral", *Journal of Economic Surveys*, No. 2, pp.191-214.

Columba F., Gambacorta L. and Mistrulli P.E. (2006), "L'attività dei Consorzi di garanzia collettiva dei fidi in Italia", *Bancaria*, No. 7-8, pp. 84-96.

Conning J. (1996), "Group Lending, Moral Hazard and the Creation of Social Collateral", IRIS Working Paper, No. 195, University of Maryland College Park.

Conning J. (1999), "Outreach, Sustainability and Leverage in Monitored and Peer-Monitored Lending", *Journal of Development Economics*, Vol. 60, pp. 51-77.

Craig B.R., Jackson W.E. and Thomson J.B. (2007), "Small Firm Finance, Credit Rationing, and the Impact of SBA-Guaranteed Lending on Local Economic Growth", *Journal of Small Business Management*, Vol. 45, No. 1.

Cuñat, V. (2002), "Trade Credit: Suppliers as Debt Collectors and Insurance Providers", *European Finance Association*, 2003 Annual Conference Paper No. 367.

Diagne A. (1998), "Default Incentives, Peer-Pressure, and Equilibrium Outcomes in Group-Based Lending Programs", Paper presented at the Annual Meeting of the American Economic Association in Chicago January 3–6. International Food Policy Research Institute, typescript.

European Commission (2005), *Guarantees and Mutual Guarantees. Report to the Commission by an Independent Expert Group*, January.

Fedart Fidi (2005), "Il sistema dei confidi artigiani aderenti a Fedart Fidi", Fedart Fidi, Roma.

Gai L. (2005), "Prospettive per le garanzie dei confidi verso le PMI dopo la riforma del settore e Basilea 2", *Rivista Bancaria*, No. 1, pp. 29-60.

Laffont J.J. (2003), "Collusion and Group Lending with Adverse Selection", *Journal of Development Economics*, Vol. 70, pp. 329-348.

Laffont J.J.and N'Guessan T.T. (2000), "Group Lending with Adverse Selection", *European Economic Review*, Vol. 44, pp. 773-784.

Luchini M. (2005), "La nuova disciplina dei consorzi fidi: aspetti civilistici", *Le Società*, vol. 24, fascicolo No. 9, pp. 1109-1112.

Madajewicz (1997), "Capital for the Poor: the Role of Monitoring", Harvard University, typescript.

Morduch J. (1999), "The Microfinance Promise", *Journal of Economic Literature*, No. 4, pp. 1569-1614.

Panetta F. (2003), "Evoluzione del sistema bancario e finanziamento dell'economia del Mezzogiorno", *Moneta e Credito*, No. 222, pp. 127-60.

Petersen M. A. and Rajan R.G. (1994), "The Benefit of Firm-Creditor Relationships: Evidence from Small Business Data", *Journal of Finance*, No. 1, pp. 3-37.

Pozzolo A. F. (2004), "The Role of Guarantees in Bank Lending", Temi di discussione, No. 528, Banca d'Italia.

Rai A. and Sjöström T. (2004), "Is Grameen lending efficient? Repayment Incentives and Insurance in Village Economies", *Review of Economic Studies*. Vol. 71, No. 1, pp. 217–34.

Rajan R. (1992), "Insiders and Outsiders: the Choice Between Informed and Arm's-Length Debt", *Journal of Finance,* Vol. 47, pp.1367-1400.

Sadoulet L. (1997), "The Role of Mutual Insurance in Group Lending", Department of Economics, Princeton University, typescript.

Sharpe S.A. (1990), "Asymmetric information, bank lending, and implicit contracts: A stylized model of customer relationships", *Journal of Finance,* Vol. 45, pp. 1069-1087.

Stiglitz J. (1990), "Peer Monitoring and Credit Markets", *World Bank Economic Review*, Vol. 4, No. 3, pp. 351-66.

Tirole (2006), *A Theory of Corporate Finance*, MIT Press.

Vallascas F. (2005), "Le Garanzie nella nuova regolamentazione sull'adeguatezza patrimoniale nelle banche: problemi e prospettive per i confidi", *Il Risparmio*, Vol. 53, No. 1, pp. 83-132.

Varian H. (1990), "Monitoring Agents with other Agents", *Journal of Institutional and Theoretical Economics*, Vol. 146, No. 1, pp. 153-74.

Yeon-Koo Che (2002), "Joint Liability and Peer Monitoring under Group Lending", *Contributions to Theoretical Economics*, Vol. 2, No. 1.