BANCA D'ITALIA

EUROSISTEMA

Temi di Discussione

(Working Papers)

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November 2009

number 735

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MUTUAL GUARANTEE INSTITUTIONS AND SMALL BUSINESS FINANCE

Francesco Columba,[*] Leonardo Gambacorta[§] and Paolo Emilio Mistrulli[♠]

Abstract

A large body of literature has shown that small firms experience difficulties in accessing the credit market due to informational asymmetries. Banks can overcome these asymmetries through relationship lending, or at least mitigate their effects by asking for collateral. Small firms, especially if they are young, have little collateral and short credit histories, and thus may find it difficult to raise funds from banks. In this paper, we show that even in this case, small firms may improve their borrowing capacity by joining Mutual Guarantee Institutions (MGI). Our empirical analysis shows that small firms affiliated to MGIs pay less for credit compared with similar firms. We obtain this result for interest rates charged on loan contracts which are not backed by mutual guarantees. We then argue that our findings are consistent with the view that MGIs are better at screening and monitoring opaque borrowers than banks are. Thus, banks benefit from the willingness of MGIs to post collateral since this implies that firms are better screened and monitored.

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

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1. Introduction[1]

Informational asymmetries between small firms and banks may be so pronounced that profitable investment opportunities are not financed (Petersen and Rajan, 1994; Berger and Udell, 2006). Small enterprises may mitigate this problem by posting collateral or building close relationships with lenders. Nevertheless, these solutions are of little help to firms which lack collateral or credit history.[2]

In these cases, other contractual schemes may emerge to mitigate severe asymmetric information problems. In particular, borrowers may join together and share a joint responsibility for default. An example of this lending technology is group lending, a form of microfinance typically used to finance projects in poor countries. In this case, instead of lending to each single borrower, banks lend to a group of borrowers linked by a joint responsibility for a single loan granted to all of them.[3] This type of lending is not observed in industrialised countries; however, joint responsibility among firms may still be achieved, in different ways. We argue that mutual guarantee schemes may help firms achieve joint responsibility and improve their access to credit even if each firm obtains a single loan. Mutual guarantee institution (MGI) members contribute to a guarantee fund which is then used as collateral to back loans granted to the members themselves. In this scheme, joint responsibility derives from firms' contribution to the mutual fund.

Why do banks appreciate this lending technology? One reason is that each member of the MGI is better informed than banks about other members' characteristics and behaviour. Thus, members accepting joint responsibility for a loan convey a good signal to banks about their creditworthiness. Furthermore, since members agree to shoulder a penalty in case of default by a peer, members have incentives to monitor each other (*peer monitoring*).[4] Also,

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[1] We wish to thank two anonymous referees for very helpful and insightful comments. We would also like to thank Alberto Alesina, Thorsten Beck, Daria Bonfim, Craig Brown, Martin Brown, Charles Calomiris, Elisabetta Cervone, Hans Degryse, Matthias Drehmann, Martin Feldstein, Xavier Freixas, Giorgio Gobbi, Patrick Honohan, Vasso Ioannidou, Michael King, Francesca Lotti, Giovanni Majnoni d'Intignano, Patrick McGuire, Juan Carlos Mendoza, Steven Ongena, Marcello Pagnini, Rohini Pande, Fabio Panetta, Alfonso Rosolia, David Scharfstein, Fabio Schiantarelli, Jeremy Stein, Guy Stuart, Kostas Tsatsaronis, Goetz von Peter, Angelo Zago and seminar participants at the Bank of Italy, Federal Reserve Bank of Boston, Bank for International Settlements, World Bank conference on Partial Credit Guarantee Schemes, SUERF, the University of Verona, the XVII Tor Vergata International Conference on Banking and Finance, the 4th Italian Law and Economics Association Annual Conference, the 2008 International Workshop on New Financial Intermediaries, the 2009 Italian Congress of Econometrics and Empirical Economics, the 2nd Swiss Conference on Banking and Financial Intermediation, the 2009 European Financial Management Association Conference, the 2009 European Meeting of the Econometric Society, the 2009 European Law and Economics Association Conference, the Carefin-Bocconi University Conference on Best Business Models in Banking for useful comments and suggestions. Marco Massitti provided excellent research assistance. This paper was in great part written while Leonardo Gambacorta was at the Economic Outlook and Monetary Policy Department of the Bank of Italy. Francesco Columba would also like to thank the NBER, where he was a visiting scholar while working on this paper, for the stimulating research environment. The opinions expressed in this paper are those of the authors only and do not necessarily reflect those of the Bank of Italy, the NBER or the BIS.

[2] The consequences of guarantee requirements for the cost and availability of bank financing have been examined in numerous theoretical and empirical studies (see, for example, Smith and Warner, 1979; Stulz and Johnson, 1985; Manove, Padilla and Pagano, 2000). For a more complete review, see Coco (2000) and Pozzolo (2004).

[3] For a review of group lending and microfinance, see among others, Armendáriz and Morduch (2005).

[4] 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 its share of the debt, or else the entire group loses access to future refinancing. Group and coalition concepts are also central in overcoming asymmetric information problems in the well-known papers by Leland and Pyle (1977), Bryant (1980), Diamond and Dybvig (1983), and Boyd and Prescott (1986).

since many firms contribute to the mutual fund and each bank usually does not lend to all of them, by lending to some MGI affiliates, banks are able to buy some credit risk protection from other MGI members. This does not alter the probability of default for each individual borrower, but may lower the expected loss given default.

Another reason group lending is successful in improving credit market access for small firms is that, while each firm individually lacks collateral, by joining together they can provide the bank with the *social capital* within the group.

MGIs are quite widespread in Europe: on the basis of the latest available data provided by the European Mutual Guarantee Association, there are more than 1.4 million small and medium-sized enterprises (SMEs) affiliated with an MGI in the European Union. MGIs are particularly widespread in Germany, France, Spain and Italy. Italian MGIs represent the largest component of the European mutual guarantee sector, accounting for 37 per cent of the total outstanding volume of guarantees to SMEs.

In this paper we focus on Italian MGIs which supply personal and real estate guarantees to banks, allowing for partial coverage of potential losses of SME lending,[5] and collectively negotiate interest rates charged on loans backed by their guarantees.

MGIs 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 MGIs to acquire information that firms share within the business association. MGIs in Italy are typically affiliated with business associations by means of federations that provide organisational assistance, including staff support, technical equipment and premises. They also lobby local and national governments and chambers of commerce to provide the MGI association with the necessary funds.

We focus on the Italian credit market, using a unique dataset including loans to small businesses (ie firms with less than 20 employees). We verify whether MGIs afford affiliated firms with better credit conditions than other similar firms. To this end, 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 the MGI itself, we focus on overdraft loans, which are typically not backed by any guarantee. In this way, we verify whether or not the MGI's willingness to post collateral is beneficial to banks.

We also test whether the benefits depend on MGI characteristics. The test aims at shedding light on the internal functioning of MGIs in order to establish the ultimate causes of the reduction, if any, in asymmetric information problems. In particular, we explore 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. 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.[6] In theory, public funds may either improve or deteriorate the informational efficiency of MGIs. On the one hand, public funds raise a moral hazard problem. On the other, the presence of public funds in an MGI may convey a positive signal to banks about the MGI's capacity to

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[5] In the new financial set-up envisaged by Basel II the relevance of these guarantee schemes is growing since they may, under certain conditions, also mitigate the risk associated with banks' SMEs portfolio and a reduction in regulatory capital requirements for financial intermediaries. The new Basel II accord categorises most MGIs 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 SMEs loan portfolio.

[6] Around 10 per cent of MGIs receive such contributions, accounting on average for more than 50 per cent of the total funds.

attract further external funds that may be used as additional collateral to reduce the expected losses borne by banks if MGI affiliates default.

The paper is organised as follows. Section 2 explains the data and the empirical strategy, while Section 3 presents the results and robustness checks. The final section summarises the main conclusions.

2. Data and econometric model

2.1 The activity of mutual guarantee institutions

Italian MGIs are typically constituted as guarantee cooperatives, which are non-profit companies for the support of the members, and with the creation of a syndicated fund. Italian MGIs must be entered in a special register (according to Italian banking law) and are subject to prudential regulation only when they reach a specific threshold of activity.

The capital endowment of an MGI (legal capital and risk funds) must be greater than 250,000 euros. Capital and risk funds may also be subscribed by third parties (local and central government, chambers of commerce, international organisations, business associations). However, at least one fifth of the capital endowment must be paid out by affiliated firms. On the basis of information released by Fedart and Federconfidi, two of the main national mutual guarantee federations, around one third of MGIs' capital endowments is paid by SMEs.

MGIs' primary activity is to provide members with guarantees to be posted as collateral to back bank loans. For this purpose, a guarantee fund (generally made up of cash and securities) is established and deposited at a bank, and is funded by 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).[7] Banks agree with an MGI to grant credit to MGI affiliates up to a multiple of the mutual guarantee fund.[8] Personal guarantees may also be collected by MGIs from affiliated firms and included in a mutual personal guarantee fund.

In case of insolvency, the bank first draws an amount from the mutual fund up to the agreed threshold (typically 50 per cent of the loan backed by the mutual fund). Then, the bank proceeds with legal action to recover the loan and may eventually give back to the MGI up to the amount recovered in excess of the share of the loan backed by the mutual guarantee.[9] In other words, MGIs are senior to other creditors, but banks may quickly obtain some money up to the agreed amount from the mutual fund; after the legal action (which usually takes a considerable amount of time) is finalised, they eventually give some money back to the MGIs.

At the end of 2004, more than one half of Italian MGIs were affiliated with one of the five main federations: Fedart-Fidi (crafts), Federconfidi and Fincredit (manufacturing),

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[7] 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.

[8] In Italy, the ratio typically reaches a maximum value of 10 to 20. However, on the basis of the data available for a sub-sample of MGIs, the average ratio between loans and guarantees is around 3 (see Table 1) and is linked to the pattern of past losses incurred with respect to the mutual guarantee fund. In other countries, the limit on the multiplier may be fixed by law. For example, in Germany and Switzerland the amount of credit granted may not exceed 10 times the guarantee fund.

[9] At the second level of the guarantee system, there are sometimes second-tier mutual consortia set up by groups of MGIs. Their function is to reinsure, or counter-guarantee, MGIs in order to more broadly distribute the financial risk involved. Reinsurance entities funded by regional governments may operate at the same level.

Federascomfidi and Federfidi (commerce, service and tourism), for a total of almost one million affiliated firms (Table 1). These federations were set up by business associations, which with the guarantee have added an "access to finance" window to their other services to entrepreneurs (accounting, social legislation, legal and fiscal support, pension funds and insurance). There is therefore also sectoral specialisation of the guarantee schemes and their respective subsidiaries, which is a distinct Italian feature.

The fact that MGIs in Italy are organised according to activity 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.

The average number of affiliated firms per MGI ranges between 634 (in the manufacturing sector) to 2,598 (in the commerce sector). The total value of loans backed by MGIs exceeds 20 billion euros, around one third of which is short-term lending. Total guarantees provided by MGIs amounted to 7.8 billion euros, with an average loan-to-guarantee ratio of around 3. Guarantees are mainly composed by monetary funds, which represent between 73 and 90 per cent of the total. Personal guarantees are more developed in the manufacturing sector, where the average firm is larger.

The Italian MGI system is heterogeneously developed among the three geographical areas, into which the Italian territory is typically split: north, centre, and south and islands (Mezzogiorno). MGI activity is concentrated in the north, where small and medium-sized firms are more widespread. MGIs are less developed in the Mezzogiorno in terms of number of affiliated firms, average capital of consortia and value of guarantees (Columba, Gambacorta and Mistrulli, 2006). This may be due to the small number of firms that have the necessary characteristics to join a MGI in this part of Italy, as well as three other factors: (i) the greater availability of public funds for firms located in the region, (ii) the relatively recent development of an MGI system there, and (iii) the high degree of opacity of SMEs in the region. At the end of 2004, credit guaranteed by MGIs represented around 8 per cent of total lending to SMEs in the Mezzogiorno, compared to 13 per cent in the centre and the north.

According to information obtained by the Italian Credit Register, at the end of June 2005 around 55 per cent of Italian banks (excluding branches of foreign banks) lent to SMEs affiliated with an MGI. Around one third of affiliated firms had business relationships with large banks (those with total assets of more than 20 billion euros), 22 per cent with medium banks (with total assets between 7 and 20 billion euros) and 46 per cent with small banks (those with total assets less than 7 billion euros).

In this paper, we argue that MGIs may mitigate asymmetric information problems in the credit market for opaque borrowers if their screening and monitoring technology is more accurate than that available to banks. As a consequence, banks may interpret MGIs' posting of collateral to small firms as a good signal of borrowers' creditworthiness, thus lowering loan interest rates.

The firm's borrowing strategy may counterbalance, at least in part, this effect. Since MGIs charge firms fees when they post collateral, firms pay an extra cost when they obtain credit by means of mutual guarantees. As a consequence, firms requesting mutual guarantees are not a random sample from the firm population, but are either (a) firms which have been rejected by banks; or (b) those which have not asked a bank for a loan since they expect to be rejected. In these cases, firms are willing to pay mutual guarantee fees, since otherwise they cannot obtain loans at all or are charged a prohibitive cost of credit. In both cases, firms tend to be riskier than the average (adverse selection). From an empirical point of view, we then argue that if one is not able to control for all relevant firm risk characteristics, the effects of an MGI on the cost of credit are downward biased. Furthermore, if firms operate in a market where banks' screening technology is sufficiently similar to that available to MGIs, the adverse selection effect may more than compensate for the positive one due to MGIs.

To verify whether firms associated with an MGI obtain, other things being equal, more favourable financing conditions compared to other firms, we focus on overdraft loans, for which MGI guarantees are rare. The analysis of this category of loan therefore allows the signalling effect associated with being an MGI member to be fully assessed. Moreover, as underlined by Berger and Udell (1995) and Chakraborty and Hu (2006), asymmetric information problems are more relevant for overdraft loans, which because of their nature are less influenced by the type of 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, received a loan in June 2005.[10] The analysis of this point in time allows to the results not to be altered by heterogeneity in monetary policy transmission mechanisms among banks. The previous change in the monetary policy rate took place in June 2003, two years before the point in time analysed. During this period, it is likely that the pass-through from monetary policy impulses and interest rates to bank loans was completed, especially on credit lines (Gambacorta and Iannotti, 2007).

The interest rates charged on overdraft loans have been obtained from the analytical Italian survey on interest rates. Our analysis will therefore focus on the firms included in the Italian Credit Register borrowing from banks participating in the Survey on Loan Interest Rates. The sample consists of 263,000 small firms, of which 46,000 (17 per cent) had a guarantee posted by an MGI. Six hundred MGIs are considered in the analysis, after trimming some data for lack of observations.

2.2 The econometric model

The econometric analysis was performed using the following baseline equation:

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

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

The interest rate applied to firm i on the overdraft loan granted by bank h net of commissions (r_{ih}) depends on both firm and bank characteristics. Firm characteristics are affiliation with an *MGI* (dummy *MGI*), geographical location (dummy *South*), registration in the artisan firms register (dummy *Art*), economic activity sector (dummy *Sector*) and loan size (a proxy for firm size, *Size*).[11]

[10] The classification by customer economic activity sector allows us to distinguish between firms with fewer than 20 employees and those with more than 20. All the firms affiliated with MGIs have fewer than 250 employees. However, the vast majority of these have fewer than 20 employees; therefore the universe of artisan firms and other small enterprises (with fewer than 20 employees) is the category most similar to firms affiliated with an MGI.

[11] Loan size is just a proxy for firm size, but is the only available measure that could be used in our sample that includes a substantial number of small firms. Information on size (total balance sheet) is available for large and medium-sized firms in the CERVED database, we have calculated the correlation between their log of total assets and the log of total loans to get a measure of the possible bias. The correlation between the two measures turned out to be quite high and statistically significant (0.90***), supporting the concept of total loans as a reasonable approximation for firm size.

A fixed effect *Bank* accounts for the characteristics of the supply of credit of each intermediary. Among the other explanatory variables, the dummy *Mono* denotes if firm *i* has a credit relation only with bank *h*, the dummy *Garov* takes into consideration the presence of real estate guarantees on the overdraft loan in question[12] and the dummy *Gartot* denotes if the financing bank receives any guarantee (personal or real) on the total loans granted to a particular firm.[13] The last variable allows us to control for non-observable characteristics of the firm (see Coco, 2000) and possible effects of a cross-subsidisation between the guarantees given on different categories of financing. In case of bankruptcy, the guarantees for a collateralised loan could, for example, raise the recovery rate of the overdraft loans if their value exceeded that of the loan to which they are specifically attached.

3. Results

3.1 The effects of MGIs on loan interest rates

Results by OLS are reported in Table 2. The β_1 coefficient in the first column indicates that, *ceteris paribus*, firms guaranteed by MGIs obtain interest rates lower by almost 0.2 percentage points than those of firms not associated with an MGI.

The other coefficients have the expected signs. The financing cost is negatively correlated with the proxy for the size of the firm. Small enterprises are typically more opaque (often the assets of the family owning the firm are not easily distinguishable from the firms' assets, and balance sheets are not very detailed), leading to a higher credit risk reflected in the interest rate.

The financing cost is higher for firms borrowing from only one bank, in line with the theoretical contributions that show that a closer relation between a bank and a firm may be associated with informational rents (Sharpe, 1990; Rajan, 1992). Specific real estate guarantees ease the recovery of the credit in case of insolvency and are therefore associated with interest rates around 1 per cent lower. On the other hand, the positive sign of the coefficient of the dummy *Gartot* is consistent with the hypothesis that banks require more guarantees from riskier firms (Berger and Udell, 1990 and 1995). Finally, artisan firms pay 3 basis points more than others.

The results also imply that small Southern firms pay, on average, a higher interest rate than firms in the rest of Italy (a difference of 25 basis points), which is consistent with the findings in other empirical works (Panetta, 2003).[14]

The robustness of the above results has been checked in a number of ways, as described in the remainder of this section.

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[12] Only real guarantees may be attached to an overdraft loan. We find those guarantees in only 5 per cent of the observations in our sample. Personal guarantees, typically given on the total of the loans, may not be linked to a specific loan category. Even if not referred to the overdraft loan, personal guarantees are nonetheless controlled for with the dummy *Gartot*.

[13] Since the dummy *Gartot* also has a value of one for borrowers with a guarantee from MGIs, the net effect of the guarantee on the interest rate applied to the overdraft loan is given by the sum of the two coefficients attached to the dummies.

[14] This result, however, does not allow us to ascertain if there are systematic differences in southern Italy between firms which are members of an MGI and those which are not.

a. Additional controls for firm riskiness and bank entry

In the second column of Table 2, 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 position is classified as overdue or bad by at least one of the banks lending to the firm. The coefficients indicate that, as expected, interest rates are on average higher (by 1.6 and 1.9 percentage points, respectively). The dummy *Entry* indicates that bank *h* has opened its first branch in the province where the firm has its legal headquarters within the past three years. This variable is meant to indicate if the results are somehow affected by specific pricing policies adopted by the banks in the areas of new location. The results indicate that, other things being equal, banks apply interest rates on average 0.2 percentage points lower in the provinces of their new locations. Neither this more aggressive pricing policy nor the two controls for the riskiness of the firm, modify the other results; in particular, the coefficient for MGI remains at around 0.2 percentage points.[15]

b. Multiple lending

In the fourth column of Table 2, we check whether the results remain valid when considering only firms that borrowed from more than one bank. The sample is half the size of the previous one (150,000 observations). The results do not indicate important differences. The β_1 coefficient reported at the top of the fourth column indicates that, *ceteris paribus*, firms guaranteed by MGIs obtain interest rates about 0.2 percentage points lower.

c. Geographical fixed effects

In Table 3, we control for the possible presence of specific geographical effects. In this way we aim to control for provincial effects that could affect both banks' interest rate setting and MGI affiliation but are not related to an MGI informational effect. The main results remain unchanged. We also have estimated the same specification described in the second column of Table 2 by adding fixed provincial effects without detecting any important changes in the variable of interest.

d. Cooperative banks

Cooperative banks are those intermediaries whose characteristics are closest to those of MGIs. 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 reasonable to assume that they are as able as MGIs to screen and monitor local borrowers. Despite this, we observe that even cooperative banks operate with MGIs. The reasons for this may be quite different compared to those of other banks.

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[15] In order to analyse in more depth if these results depend on the specific dataset used in the above analysis, we performed a different test on the universe of Italian firms. Using a probit model and controlling for all other relevant characteristics, we found that affiliation of a firm with an MGI lowers the probability that a loan will go into default. We are therefore confident that the results on the advantage gained in terms of interest paid by firms affiliated with an MGI are not due to a bias in the composition of the sample but are linked to the beneficial effect of the MGI affiliation. More details are reported in Columba, Gambacorta and Mistrulli (2009). Another test was to restrict our sample to banks operating with an MGI (see the third column of Table 3), in order to prevent a bias deriving from the fact that some firms may have relationships only with banks which do not operate with any MGI. If these firms are, for some reason, riskier than average then our previous results may be biased. However, even after restricting our sample to banks operating with an MGI we do not detect any significant changes in our previous results.

Cooperative banks might just be buying credit risk protection for those borrowers they know they are highly risky.

The results in Table 4 show that affiliation with an MGI *raises* the interest rate paid by firms borrowing from cooperative banks. This is in line with the intuition provided in the previous section: if a bank has accurate screening technology, firms requesting a mutual loan guarantee come from a pool of applicants of overall lower quality.

Also, these results support the view that the reason a mutual loan guarantee lowers interest rates is linked to a better ability of MGIs to deal with asymmetric information problems.

e. An alternative estimation methodology

Table 5 reports the results obtained by using a treatment effect model, where the selection equation for the decision of the firm to join an 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 MGIs, is higher. We also include a specific control for 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 indeed increases to 0.6 percentage points.[16]

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

To fully bring into the picture the role of MGIs in mitigating asymmetric information problems, we tried to insulate the effect of MGI size and the role of external funds provided by public or semi-public bodies (see Table 6).

To perform this test, we restricted our sample to those firms backed by an MGI guarantee. As a consequence, in order to get unbiased estimates, we model the affiliation choice. To this end, we use the Heckman procedure by modelling the sample selection in the same way as for the treatment estimation.

Intuitively, a larger group size tends to increase opportunities for risk sharing and more professional management and screening tools. In other words, there may be economies of scale. On the other hand, a larger number of firms in the MGI also increases the scope for free riding in debt-repayment decisions (moral hazard). Therefore, it is possible that an increase in the number of firms in an MGI will initially determine a lower interest rate since the bank is better insured against individual defaults; however, beyond a certain point, when the number of borrowers in the group increases too much, the free riding problem could outweigh the benefits from economies of scale, and the interest rate should start to rise.

Table 6 shows this test using a model that includes MGI size, in terms of number of firms, both in linear (*Firms*) and quadratic ($Firms^2$) form. From the estimated coefficients, Figure 1 shows the relationship between the number of firms associated with an MGI and the interest rate paid on average by an affiliated firm. The relationship is analysed over the entire range of the number of firms in our sample (from a minimum of nearly zero to a maximum of 21,200

[16] The results shown in the selection equation are also interesting. The probability a firm will 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 MGIs supply technical support and advice to firms that apply for financial public aid.

firms in a single MGI). The interest rate initially declines, because of the positive effect of the size on selection and peer-monitoring effectiveness, reaching a minimum value when the number of firms in an MGI is around 8,500. Beyond this threshold the interest rate paid by affiliated firms starts increasing, and the benefit of being part of a (large) MGI vanishes when the consortium has 17,000 participants.

It is worth mentioning that this test also reduces the possibility that the results are simply driven by the fact that MGIs may help small firms to have more bargaining power vis-à-vis banks (even on overdraft lines, where there are typically no guarantees). If this were the case, the size variable should always exert a negative effect on the interest rate because banks should agree to set a lower profit margin, since this could be compensated by higher volumes. The U-shaped form of the relationship between interest rate charged and size contradicts this simple hypothesis.

In order to evaluate the role of external funds provided by public or semi-public bodies, we also inserted in the specification reported in Table 6 a dummy variable that takes the value of one if financial support is provided to the MGI by local and national government authorities. As discussed above, public funds may or may not improve the informational efficiency of MGIs. On the one hand, public funds raise a typical problem of moral hazard. On the other hand, public funds may convey a positive signal to the lender about the capacity of the MGI to attract more external funds that may be used as additional collateral and reduce the risk incurred by a private lender. The results reported in Table 6 show 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 with a “public MGI”. Moreover, the net effect of the guarantees on the interest rate applied to the overdraft loan (given by the sum of the two coefficients attached to the dummies *Gartot* and *Garov*) is not statistically different from zero. These results suggest that the positive signalling effect for an MGI from receiving public funds is more than compensated for by the negative effect given by a relaxation of the selection criteria.

4. Conclusions

In this paper, we have investigated whether affiliation with mutual guarantee institutions affects firms’ cost of credit. The main results of the paper are the following.

First, small firms affiliated with MGIs obtain loans at interest rates significantly lower than those for unaffiliated small firms. Second, an increase in the number of firms affiliated with an MGI improves the positive selection and peer-monitoring effects up to a limit; when the number of borrowers in the group increases beyond a certain point, the free riding problem outweighs the benefits from increasing the number of additional firms. Third, the evidence seems to support a weakening of the benefits from affiliation with an MGI when the amount of public funds available to MGIs increases, consistent with the notion that the moral hazard effect offsets part of the benefits gained with peer monitoring.

From a policy perspective, our results support the role of MGIs in easing access to credit for small businesses. However, policy measures to give incentives to increase the size of MGIs, including by means of public funds, should be taken with caution since while larger MGIs are better able to diversify credit risk and may provide more professional management and screening tools, they may also suffer from poor screening and monitoring incentives.

Table 1

Mutual guarantee institution (MGI) activity in Italy in 2004 (1)

(Number of firms, millions of euros, percentage values)

Federations	Sector	Number of affiliated MGIs (a)	Number of affiliated SMEs (b)	Number of SMEs for MGI (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	0.0	100.0	15.7	4,022	80.0	20.0
Federconfidi	Industry	74	46,901	634	7,140	0.0	100.0	4.4	752	0.0	100.0
Fincredit	Industrial SMEs	25	34,561	1,382	1,809	….	….	17.6	1,013	….	….
Federascomfidi	Commerce, Service and Tourism	67	174,052	2,598	3,100	0.0	100.0	13.0	1,368	0.0	100.0
Federfidi	Commerce, Service and Tourism	34	70,000	2,059	….	….	….	….	640	….	….
Total of the 5 Federations		514	992,996	1,932	20,543	0.0	100.0	0.0	7,795	0.0	100.0
Total Italy (3)		1,073									

(1) Data are supplied by each Federation. - (2) Fedart-Fidi data are based on a special survey in which 208 MGIs took part. - (3) Data provided by Italian Foreign Exchange Office.

Table 2

MGIs and banks' interest rate setting

The dependent variable is the interest rate on overdraft loans for firms with fewer 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 one MGI	(4) Firms borrowing from more than one bank
firm guaranteed from an MGI (*MGI*)	-0.181 ***	-0.198 ***	-0.190 ***	-0.209 ***
	0.011	*0.011*	*0.011*	*0.020*
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 ***
	0.019	*0.019*	*0.019*	*0.029*
existence of any type of guarantee on other credit lines (*Gartot*)	0.982 ***	0.977 ***	0.973 ***	0.428 ***
	0.010	*0.009*	*0.100*	*0.018*
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 has been located for less than 3 years (*Entry*)		-0.177 ***	-0.222 ***	-0.222 ***
		0.022	*0.023*	*0.031*
constant (α)	10.298 ***	10.439 ***	10.439 ***	10.828
	2.490	*2.461*	*2.461*	*8,195*
adjusted R^2	0.205	0.223	0.224	0.196
Number of observations	347,461	347,461	336,724	149,837

Table 3

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 an MGI (*MGI*)	-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 has been located for less than 3 years (*Entry*)		-0.076 ***
		0.023
adjusted R^2	0.231	0.249
Number of observations	347,420	347,420

Table 4

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) Firms borrowing from more than one bank	(4) Only banks with an operating relationship with at least one MGI
firm guaranteed from an 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 has been located for less than 3 years (*Entry*)		-0.097	-0.119	-0.067
		0.097	*0.127*	*0.100*
constant (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 5

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 an MGI (MGI)	-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 has been located for less than 3 years (*Entry*)		-0.224 ***
		0.026
constant ($\cong$)	10.191 ***	10.331 ***
	2.550	*2.521*
selection equation for MGI		
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 6

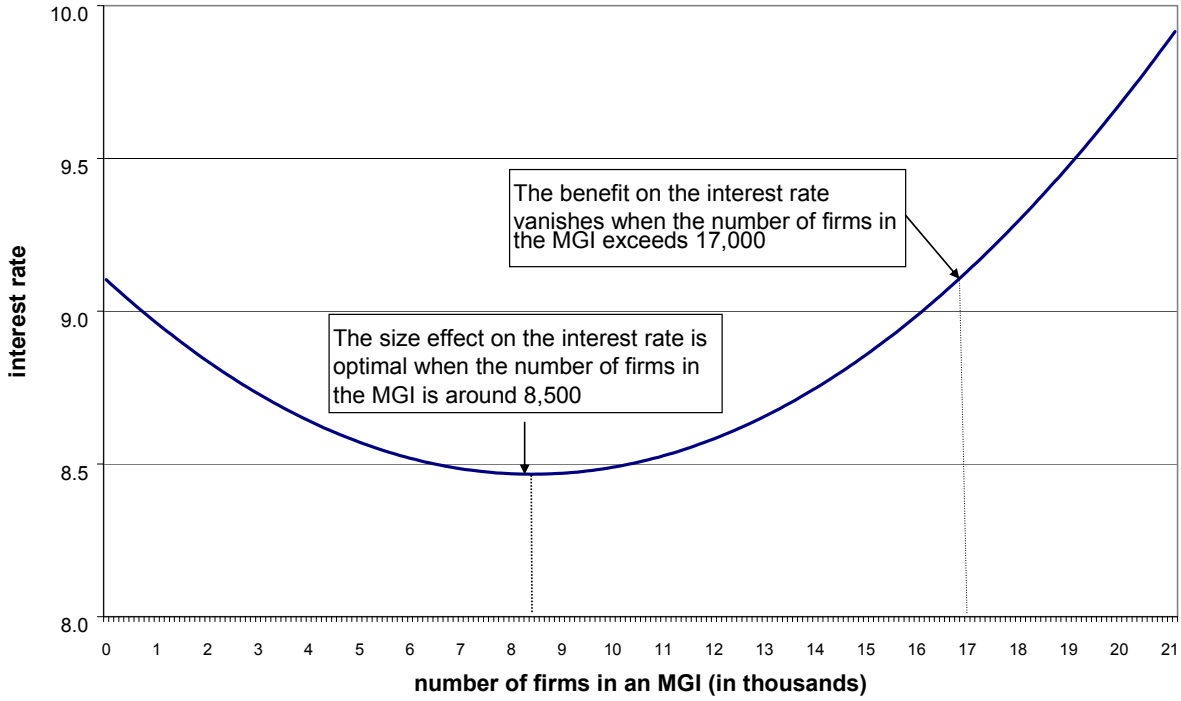
Tests on the peer monitoring effect: group size and public MGIs

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 has been located for 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
constant ($\cong$)	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
Pseudo-R^2	0.309
Number of uncensored observations	45,620

Figure 1

The optimal number of firms in MGIs



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