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# DEBT MATURITY AND FIRM PERFORMANCE: EVIDENCE FROM A QUASI-NATURAL EXPERIMENT

by Antonio Accetturo*, Giulia Canzian†, Michele Cascarano* and Maria Lucia Stefani‡

## Abstract

Asymmetric information between lenders and borrowers may lead to a suboptimal provision of long term credit by banks; this may have negative effects on firms' investments and, as a consequence, future growth. In this paper we analyze a policy intervention -- *Mutuo di Riassetto* (MR) -- launched by an Italian regional government, aimed at increasing firms' debt maturity. Using a combination of difference-in-differences and instrumental variable approaches, we find that the MR program had a temporary impact on debt maturity by raising firms' share of long-term debt only for the first two years after the start of the program. The policy did not have relevant effects on performance: firms registered a short-term increase in intangible assets and (to a lesser extent) profitability, but did not display any permanent rise in terms of sales, tangible assets, labor cost, or credit access. We also find that firms involved in the MR program observed a significant rise in the probability to default.

**JEL Classification**: H4, G3.
**Keywords:** policy evaluation, debt maturity, firm performance.
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## Contents



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# 1 Introduction[1]

The 2008-09 financial crisis has put the debt maturity structure of the firms at center stage for policy debate. Credit crunches in the period 2008-09 were mostly carried out by the non-renewal of existing debt, with relevant negative consequences for non-financial companies (Almeida et al., 2012).

In principle, if credit markets were perfect, debt maturities should just reflect the optimizing firms' choices that reflect their fundamentals and their preferences in terms of factor mix (He and Milbradt, 2016). In case of market imperfections, things become more complex. Short term maturities may help to overcome moral hazard problems since they could enable creditors to continuously monitor firms' efforts. The downside of this feature is that companies may tend to finance long term investments by using short term debt. The continuous need to roll over the credit generates an overexposure to liquidity risks, eventually leading to high firms' growth volatility and negative future prospects (Diamond and Rajan, 2001).

In the wake of the financial crisis (October, 2008) the regional government of the Province of Trento (the region is also called Trentino) in Italy, aimed at addressing the composition of corporate debt. The policy – denominated *Mutuo di Riassetto* (MR hereafter) – took the form of a credit guarantee scheme and it allowed firms to borrow long-term loans at subsidized interest rate with the stated aim to reduce the risks associated with short-term credit.

The aim of this paper is to provide a counterfactual evaluation of MR and analyze whether the exogenous increase in debt maturity influenced firms' performance.

The design of the intervention poses serious problems on the identification of a causal relationship between the policy and our outcome variables. The take-up of the policy was fully voluntary and no serious selection was made by the authorities in charge of the program. To tackle self-selection we combine an instrumental vari-

[1]We wish to thank Erich Battistin, Nicola Branzoli, Federico Cingano, Guido de Blasio, Petra Degasperi, Enrico Rettore, Paolo Sestito, Enrico Sette, two anonymous referees, and seminar participants at the Bank of Italy, the IX IBEO Conference (Alghero, 2018), and the European Economic Association Conference (Cologne, 2018) for their comments. The views expressed herein are those of the authors and not necessarily those of the respective institutions.

able approach with a Difference–in–Differences (diff–in-diffs) framework. In order to apply for MR loans, firms had to join one of the Mutual Guarantee Institutions (MGIs) that were active, in that period, in Trentino. A massive informative campaign was implemented to induce firms that were already affiliated to join the program. This implied that the "already affiliated" group had an informational advantage with respect to other firms and were induced more often to participate. We use the "already affiliated" status as an instrument for the treatment; we present evidence that this status is unlikely to directly influence firm performance.

We find that MR was successful in increasing the share of long term debt for the first two years after the implementation of the policy. The availability of cheap long term debt induced firm to apply for the MR; however companies typically chose the shortest available maturity for MR loans (two years) and, once the subsidized loan was repaid, the share of long term debt went back to pre-treatment values. These results suggest that firms' debt maturity was not sub-optimally short and just reflected firms' fundamentals (He and Milbradt, 2016). The short-term shift in the debt maturity did not have relevant consequences on firm performance: treated companies registered a short-run increase in intangible assets and (to a lesser extent) profitability, but did not display any permanent rise in terms of sales, tangible assets or labor cost. MR did not even alter bank-firm relationships in terms of credit concentration and number of creditors. Moreover, we find that firms involved in the MR program observed a relevant rise in the probability to default. The rise of the probability to default result is consistent with the evidence that MGIs are likely to foster moral hazard (D'Ignazio and Menon, 2018).

Our paper offers several novel contributions to the literature.

First, we are evaluating the first (to our knowledge) public intervention directly targeting corporate debt maturity structure. Understanding whether policy interventions like the MR succeeded in their goal is important, considering that the financial crisis fostered the idea that the public authority should intervene whenever capital market imperfections cause a shortage of long-term finance.

Second, we provide new evidence on the role of public guarantee schemes in enhancing credit access to small and medium enterprises.[2] Available evidence for advanced economies (Italy included) is consistent with our findings: public guarantee schemes have a positive effect on loan quantities and credit costs (see: Lelarge et al. (2010) for France; Uesugi et al. (2010) for Japan; Zecchini and Ventura (2009) for Italy); however, these interventions are likely to foster moral hazard with an increase in the default rates by borrowers (see: Saito and Tsuruta (2014) for Japan; de Blasio et al. (2018) and D'Ignazio and Menon (2018) for Italy).

Finally, we contribute to the literature on the relationship between firms' debt maturity and performance. Available empirical evidence tend to support the idea that, *coeteris paribus*, longer maturities are associated with better firms' performance. For example, Duchin et al. (2010) show that – in the 2007-08 financial crisis – the negative effects of the credit crunch on firms' investments was more pronounced for companies with a high share of short-term debt. Demirgüç-Kunt et al. (2017) use a cross-country approach to show that long-term debt is negatively correlated with growth volatility. Gopalan et al. (2014) analyze the relationship between debt maturity and credit quality on a sample of listed American companies and find that the share of long-term debt negatively correlates with the rollover risk; similar findings were found by Wang et al. (2017) in their analysis on credit costs.[3] Compared with this literature, we analyze the impact of debt maturity in a quasi-experimental design driven by a policy shift; we show that policy-induced shifts to the maturity of loans are temporary if firms' fundamentals remain unchanged. Stated in a different way, debt maturity *per se* is not able to impact on firms' performance.

[2]Public guarantee schemes have become important financial instruments devoted to support firm's access to credit during the financial crisis. OECD estimates that almost 80% of its countries implemented some form of credit guarantee scheme from 2009 onwards, and that, relying on such instruments, 14 European countries provided their firms, in the period 2007-2013, with a 200 billion of euros funds, capable of generating a tenfold amount of finance. The credit guarantee schemes issued by Italian financial institutions represent the 41% of the total guarantees provided in the EU, and they amount to 1,4% of Italian GDP.

[3]Other papers on the topic were more based on conditional correlations. See, for example, Barclay and Smith (1995), Guedes and Opler (1996), Scherr and Hulburt (2001), Schiantarelli and Sembenelli (1997), and Molinari et al. (2016).

The paper is organized as follows. Section 2 briefly describes the institutional framework and the MR policy. Section 3 presents the identification strategy and the description of the data used. Sections 4 and 5 show the results; Section 6 concludes.

# 2 Institutional Background

## 2.1 Economic crisis, credit markets, and the local economy

*The Italian Crisis.* – Between 2007 and 2014, the Italian economy was hit by two severe recessions that determined a cumulative fall in GDP by 8.5%. The two recessions were inherently different in terms of both origins and consequences on the Italian economy.

The first recession (2008-09; the so-called "great recession") was "imported" from abroad mostly through the great trade collapse (Caivano et al., 2010). Financial factors directly played a minor role due to the fact that the balance sheets of Italian banks (especially the smaller ones) were only marginally affected by the presence of "toxic" assets (Asset Backed Securities, Collateralized Debt Obligations, etc.) or by the exposure to Lehman' liabilities (Bank of Italy, 2009). Despite the relatively healthy state of the Italian credit institutions at that time, credit crunched mostly through the interbank channel (Gobbi and Sette, 2014), with large consequences in terms of investments (Cingano et al., 2016) and labor demand (Berton et al., 2017).

The second recession had more "domestic" origins and was the consequence of the sovereign debt crisis that hit European countries in the summer of 2011; the increased riskiness of sovereign bonds (a large share of banks' total assets) (Bofondi et al., 2013) had an impact on the funding of intermediaries (Battistini et al., 2014; Angelini et al., 2014) with relevant consequences on the credit supply. At the same time, fiscal consolidation determined a large drop in the domestic components of GDP and a negative impact for the service sector and domestically oriented firms.

*The Crisis in Trentino.* – The effects of the two recessions in the Province of Trento were slightly more limited: between 2007 and 2014 the GDP fell by 2.4%.

The impact of the great recession was relatively attenuated due to the fact that the local economy is more service-oriented, specialized in the production of relatively a-cyclical goods (like agricultural products), and, in general, less dependent on exports (Bank of Italy, 2014).

At the end of 2009, the annual growth rate of the credit to local firms and households slowed down to 3% from roughly 12% two years before; in the same period, the growth rate in Italy fell to zero. The relative better performance of Trentino's credit markets is due to both demand and supply factors. As we said, the impact of the crisis on the real economy was less severe compared with the rest of Italy. On the supply side, Trentino's credit market was dominated by the presence of a large number of small cooperative banks whose market shares (in terms of loans) exceeded 50% (the same type of banks account for less than 10% in the rest of the country). These banks were relatively liquid and well capitalized with no ties with the interbank markets (Bank of Italy, 2010); this was likely to reduce the magnitude of the credit crunch in the region.

The impact of the sovereign crisis on the local economy was instead similar to the rest of the country due to the heavy reliance of the local economy on the domestic demand. Moreover, credit from local banks started to crunch due to the increasing share of non-performing loans (Bank of Italy, 2017).

*Local Policy Responses.* – The Province of Trento is characterized by a large financial autonomy according to which the local government has the right to retain 90% of all tax revenues collected in the area but it is not entitled to receive transfers in case of recessions. This implies that, from a local public finance point of view, Trentino can be viewed as a small autonomous country. At the start of the great recession, the regional government of the Province of Trento used its relatively large financial resources to counteract the crisis. Two main plans were put forward. The first, launched on October 2008, was called "emergency measures" mostly aimed at preserving households and firms from the incoming credit crunch, that after Lehman was considered inevitable even in Trentino. The second was included in the 2009

budget law, with a fully-fledged "anti-crisis plan" for the years 2009-2010. Both plans expanded public expenditures by more than 25% and amounted to roughly 7% of local GDP.[4]

## 2.2 The *Mutuo di Riassetto*

The *Mutuo di Riassetto* (MR) was part of the "emergency measures" against the credit crunch; at the end of 2008, credit restrictions to firms were mostly operated by the non-renewal of short-term credit lines (Bank of Italy, 2009). Policy makers were convinced that the local firms' debt maturity was suboptimally short and firms were financing long-term plans with short-term credit. This meant that the incoming credit crunch could have relevant real effects. For this reasons, the stated aim of the MR program was to increase the share of long term debt by providing subsidized loans that could replace short term ones.

Mutual Guarantee Institutions (MGIs), whose functioning is described in Appendix A, played a crucial role in the policy. The regional Government asked the local MGIs to manage the collection of firms' applications for loans. At that time there were three active MGIs in the Province of Trento: *Cooperfidi* (for agricultural firms and cooperatives), *Condifi Impresa* (for non-agricultural firms), and *Cooperativa Artigiana Provincia di Trento* (for artisans). Local MGIs were cumulatively provided with 12,500,000 euro, upon which they offered credit guarantees to the firms that applied for a loan. In order to apply, firms had to join a MGI and present a project that was eventually evaluated by the MGI itself. No specific provisions were envisaged for the type of project: firms could present plans for both industrial investments and financial restructuring. All firms located in the Province of Trento were eligible for the program, with no distinctions in terms of size or sec-

[4]While it is true that Trentino was relatively sheltered by the economic and financial crisis, reliable data on the impact of the recession on the local economy became available only several quarters later. Uncertainty in that moment was particularly high and this triggered the policy reaction. Against this backdrop, we also cannot rule out political economy considerations. Local elections took place in the moment of highest uncertainty on November 9th, 2008; the fact that the launch of the "emergency measures" occurred just few days before elections also signals a concern by the policy makers to appear determinate in front of the electorate.

tor; applications for the loan were therefore totally voluntary. Once the evaluation process ended, MGIs sent eligible loan requests to the banks participating to the program (actually, all main active banks in the Province of Trento), that made the final decision on the loan.

All loans were supported by a credit guarantee that could account, at most, to the 50% of the value of the requested loan. Interest rate paid by the firm could not exceed 2.5%.[5] The requested loan could not exceed 250,000 euro.

According to the official record provided by the Province of Trento, MGIs received a total amount of 2857 applications; during the evaluation period by both MGIs and banks, some of those applications were either withdrawn or discarded due to incomplete information; however, no serious selection was made on the quality of projects. At the end 2372 firms actually received the MR loan.

By March 2009, firms started to receive subsidized loans.

# 3 Identification strategy and Data

In order to assess the impact of the MR program, we start estimating the following regression model:

$$y_{it} = \alpha_i + \beta T_{it} + \delta_t + \varepsilon_{it} \tag{1}$$

where $y_{it}$ is the outcome of interest (share of long-term debt in the baseline analysis) for firm $i$ in time $t = \{0, 1\}$. $\alpha_i$ are firm fixed-effects, $T_{it}$ is an indicator equal to one if firm $i$ was treated at $t = 1$, and $\delta_t$ are time fixed-effects. Treated firms are those that actually received the subsidized loan under MR.

For all analyses $t = 0$ is 2008, the year before the start of the policy; for $t = 1$ we use, recursively, 2009 to 2012.[6] We always work on two-periods panels to minimize the impact of serial correlation on the estimation of standard errors (Bertrand et al., 2004).

[5] This actually reduced to zero real interest rates.

[6] Standard errors are clustered at firm level.

$\hat{\beta}$ is the diff-in-diffs estimate. Its causal interpretation rests on the hypothesis that omitted variables may influence the level but not the evolution over time of the dependent variable; in other words the common trend assumption must hold. The characteristics of the program are not able to warrant the absence of such confounders: since participation is voluntary, more dynamic firms might have the incentive to join the program to access cheap loans for investments that would have been done anyway, and this would create an upward bias in the estimates. Alternatively, bad firms could have the incentive to apply for the MR to increase debt maturity and their probability to survive in negative macroeconomic conditions.

To mitigate this problem we combine the diff-in-diffs strategy with, first, the Propensity Score Reweighting (PSR), and, second, with an Instrumental Variables approach (IV).

### 3.1 Propensity score reweighting (PSR)

The first method relies on the classic selection–on–observables argument. The idea is that, once we select a control group that is perfectly comparable with the treatment group in terms of observable variables (labelled as $x$), treatment can be considered as good as randomly assigned.

Upon the PSR, the control group is reweighted so that the distribution of the observables is similar to the one for the treated group (DiNardo, 2002; Kline, 2011).

The weights are calculated by using the propensity score function $\rho(x)$.[7] Non-treated units are assigned weight $\frac{\rho(x)}{1-\rho(x)}$ while treated observations have weight equal to one. Weights are then re-normalized to sum to one.

In practice we first run a logit regression in which the treatment indicator is regressed over a number of firm level observable characteristics. Then, we use predicted probabilities (propensity score function) as weights to estimate equation (1) by weighted least squares.

[7] $\rho(x)$ can be estimated by logit or probit (DiNardo et al., 1996).

### 3.2 Instrumental variable approach

Propensity score reweighting is based on the idea that there are no additional unobservables that correlate with the changes in the outcome variable. In other words, the selection into the treatment is solely driven by observable variables. This could not be the case in our data. To solve this problem we resort to an instrumental variable approach.

As an instrument we consider a dummy variable equal to one if the firm was part of a MGI before the crisis (i.e. before 2008). We label this the "already affiliated" group (AA).

There are two conditions for the instrument to be valid.

First, the instrument must be correlated with the treatment status. As we have seen in section 2, the condition for a firm to be treated was its participation to a MGI. At the end of 2008, MGIs of the Province of Trento made a pervasive campaign among their members to advertise the MR program. This implies that firms that were already part of a MGI before the crisis had an informational advantage over other companies of Province of Trento. Advertisement was quite successful: table 1 shows the joint distribution by treatment and AA status for all firms in the Province of Trento. All companies already belonging to a MGI (204) decided to join the program, while, at the same time, a sizeable number of other firms (226) decided to access the policy.[8] Further evidence of the relevance of the instrument will be provided in the first stage statistics.

The second condition is that the instrument does not directly influence the outcome variables (exclusion restriction). In order to tackle this issue it is important to understand how and why firms join a MGI. As explained in Appendix A, firms decide to be part of a MGI when they need bank credit but are unable to obtain it; MGIs provide a guarantee for bank credit. Joining a MGI entails the payment of a

[8]Figures in table 1 refer to the estimation dataset based on limited liability firms that continuously submitted a balance-sheet between 2004 and 2012 (see section 3.3). This implies that the total number of treated firms in the dataset (430) is lower than the total number of firms that received the MR (2372).

fixed cost that is the purchase of one share of the institution plus negligible administrative costs. For the MGIs operating in Province of Trento fixed costs amounted to 300 euros in 2009. Loans guaranteed by MGIs are generally more expensive as interest rates include a fee that is proportional to the value of the guarantee. Once firms join a MGI, they have weak incentives to leave even when their creditworthiness is restored. Affiliated companies may find it optimal to remain in the MGI for precautionary reasons against the risk of future rationing while selling their share would determine a negligible return (300 euros). As a result, many firms are MGI members but do not actually need (and use) MGIs to access the credit markets (since MGI-guaranteed loans are more expensive).

In a number of robustness checks we show that the estimated results are driven by the "already affiliated" firms that – in the pre-crisis period – did not actually use the MGI guarantee. In a placebo exercise, we also show that the affiliation status to a MGI in the nearby province of Bolzano (that shares several similarities with respect to Trentino) does not influences *per se* firms' credit access.

The similarity between AA and non-AA groups in terms of observables is ensured by PSR on AA status.[9] However, this procedure is not crucial for our results.

### 3.3 Data and descriptive statistics

We use two main data sources. The first is the Central Credit Register (CR), an information system on the debt held by the customers of banks and financial companies supervised by the Bank of Italy. Financial institutions are required to report performing loans in excess of a given amount (75,000 euros until December 2008, 30,000 euros afterwards) plus all non-performing loans. All loans are distinguished according to their type; in particular, according to the CR classification, term credits are defined as "long term" loans (Gobbi and Sette, 2014). CR also allows to

[9]We proceed as follows. First we run a logit regression by using the AA-status as a dependent variable over a number of firm level controls. Equation (1) is now estimated with two-stage least squares in which $T$ is instrumented by AA and observations are reweighted according to the propensity score results (see Accetturo and de Blasio (2012), for a similar approach). In practice, this approach is equivalent to control for observables in a very flexible way (Angrist and Pischke, 2008).

identify the lending institution and, for each loan, which type of guarantee was presented.

The second database is provided by Cerved Group (CG) and contains balance sheets data of the universe of Italian limited liability companies. CG draws information from official data recorded at the Italian Registry of Companies and from financial statements filed annually at the Italian Chambers of Commerce on a compulsory basis.

The list of the treated firms was provided by the local Government of the Province of Trento. As for the MGIs, we only consider *Confidi Imprese*, that was the one aimed at providing guarantees for limited liability companies (i.e. those in the CG database). *Confidi Imprese* provides us with the list of affiliated firms by year of enrolment.

The merge between the CR and CG datasets for the Province of Trento leaves with an unbalanced panel of almost 5,000 firms per year. This is not a small sample for an area of roughly 500,000 people that registered 41,000 firms (included individual and non-profit companies) according to the 2011 census. Limited liability companies account for roughly 40% of total employment and 70% of total sales for the firms in the Province of Trento.

Entry and exit from the sample is quite intense for two main reasons. The first relates to the CR dataset: firms appear on CR only if they have a performing loan above the threshold; this implies that companies extinguishing their loan exit the dataset while they are still active. The second is relative to the CG data: all active limited firms are requested to submit their balance sheet, but, besides exits from the market, there can be cases of misreporting to the Italian Registry of Companies or changes in the firm type (for example, from limited liability to partnerships).

To cope with these issues, we first construct a balanced sample from CG dataset, by keeping firms that continuously submitted a balance sheet from 2004 to 2012.[10] This leaves us with 4,193 observations per year, 430 of which were treated and 204

[10]The use of the unbalanced panel does not change the results; evidence available upon request.

belonged to a MGI before 2008 (AA group). Then, we merge this sample with CR. For each firm not appearing in CR we imputed missing values (share of long-term debt included) with zeros as they do not have bank debt in that year. In a robustness check we discard firms with imputed information without relevant changes in the results.

Appendix B describes how all variables used in the analysis are constructed.

Descriptive statistics for treated and non-treated firms before the crisis are reported in table 2. All variables are averaged over the pre-crisis period (2004-07). By considering observable characteristics, treated companies are radically different from the non-treated ones: they are larger both in terms of sales and assets; they have more debt (proxied by debt over assets) and with a longer maturity (share of long term debt), and, finally, they have relations with an higher number of banks, although loans are more concentrated toward the main bank.

The coefficent of determination in Table 3 shows how much of the variability of long term debt share can be accounted for by the observable firm characteristics. By augmenting the set of control variables in the regression model we observe how size and leverage of firms explain a relatively large part of the variance of debt maturity structure and how a bigger part of it is captured by the share of loans lent by the main bank, namely by the attitude of firms to relationship banking. Sectoral characteristics explain only 3 per cent of total variance. Neverthless we have to take into account that the observable characteristics of firms cannot explain almost 50 per cent of the overall variability.

As we said in the previous section, the exclusion restriction for the IV approach is respected if past MGI affiliation *per se* does not influence firms' access to credit market. In other words, firms already affiliated to a MGI access the credit market even without the MGI guarantee. In order to check this issue we analyze the guarantees that each firm presented to obtain a loan. In particular, we calculate the share of loans that is *not* warranted by a MGI institution for the period 2006-07. If this share were close to zero, firm's access to credit market is heavily dependent

on MGI guarantees thus hinting at a possible violation of the exclusion restriction. This is not the case in our dataset. The average share of loans not guaranteed by a MGI is 0.80; the median one is 0.82. We further investigate this issue in the robustness check section.

### 3.4 Propensity score results and balancing properties

Table 4 reports the logit regressions used to obtain consistent estimates for the propensity score ($\rho(x)$). Regressions are made over the entire sample of 4,193 firms and by taking pre-crisis (2004-07) averaged values. Figure 1 presents the distributions of propensity scores: the upper panel shows the distribution according to treatment variable, while the lower one shows the same distribution according to the instrument. Both panels show a fair degree of overlap between the two sets of propensity scores.

Propensity scores are subsequently filtered to eliminate the observations falling outside the common support. This leaves us with 3,867 observations per year for the PSR estimates and with 4,083 for the IV.

Table 5 report sample averages and mean differences between treated and non-treated and AA and non-AA after reweighting. It is now apparent that differences have been minimized, with a slightly better performance for the balancing over AA.

## 4 Evaluation of the policy

### 4.1 Baseline results

We first analyze the relationship between the treatment and its stated objective, that is the rise of the share of long term debt.

Figure 2 presents a graphical illustration of the effect of the MR policy by plotting the average share of long-term debt over time for different groups.

Left panel shows the average for treated units and, as a double comparison, for both the (non-weighted) non-treated firms and reweighted non-treated group (i.e.

the true control group). For treated units there is a clear evidence of a jump in the share of long-term debt after the start of the policy (2009) by almost 15 percentage points, while non-treated units experienced a smaller rise by 1-2 percentage points (probably due to the partial non-renewal of short-term credits).

Two things are worth noticing in the graph. First, treated and non-treated lines are almost parallel before the start of the policy, suggesting that the common trend assumption is guaranteed. Second, all groups show a decline in the share of long-term debt after 2009. However, the fall for the treated firms is slightly more pronounced than for the other groups, thus reducing the difference recorded at the start of the policy.

Right panel presents instead the dynamics of the share of long-term debt for the non-AA, the (reweighted) non-AA, and the AA groups. The difference between the reweighted non-AA and the AA groups may be interpreted as a reduced form of the IV analysis. Even in this case, the AA group shows a sizable jump in the share of long-term debt, while the evolution before 2009 suggests that common trend assumption is respected. Differently from the left panel, the fall of the AA groups is now more marked, implying that the difference between the two groups disappears by 2012.

In both panels, the evolution over time of the non-weighted and the reweighted non-treated (non-AA) units is quite similar. While the reweighting procedure determines an upward shift of the control group, both lines move roughly parallel throughout the period, thus hinting that the reweighting procedure is probably redundant in a diff-in-diffs framework.

The graphical analysis suggests that the policy has been effective in raising the share of long-term debt at least in first three years; though, it is not able to provide a precise measure of the magnitude and the significance of the coefficient. For this reason we switch to parametric estimates.

Table 6 reports our baseline results. Panel (A) presents the OLS estimates without the reweighting procedures: coefficient $\beta$ indicates that the policy have

increased the share of long-term debt by 12 percentage points in the first year (2008-09); considering a longer time span (2008-2012) the difference reduces to 5 percentage points but it is still strongly significant. Panel (B) shows that the results when we use PSR are quite similar to panel (A). The initial jump is now slightly larger (almost 13 percentage points), while, on a longer time span, treated units succeeded in increasing the share of long-term debt by 8 percentage points.

Panel (C) shows the estimates of the IV estimator. In the first year after the policy the effect is positive and significant (almost 10 percentage points); after the second year of the intervention, the impact of the MR fades away: over the period 2008-2012 the estimate of $\beta$ is very close to zero.

First stage results for panel (C) are satisfactory. The marginal effect of the instrument over the treatment is 0.9, indicating that the instrument is able to predict the treatment status for more than 90% of the observations. The F-statistics for the first stage is very large and well above the minimum value identified by Stock et al. (2002) to detect weak instruments.

The comparison between panel (B) and (C) is interesting. In both cases, in the first, the MR determined a relevant increment in the share of long-term debt; PSR estimates show that this effect was persistent while IV results are less optimistic on the effectiveness of the policy on a longer horizon. In order to interpret the difference between the two sets of results we should remind that the PSR estimates do not take into account the selectivity bias due to the unobservables. In other words, there is a group of self-selected firms that decided to join a MGI institution during the crisis with the aim to access the policy.

Figure 3 gives a graphical representation of these dynamics; it presents the evolution of the AA and non-AA groups; this latter group is split into non-treated firms (non-treated, non-AA) and treated groups that were not part of a MGI before 2008 (treated, non-AA). The treated, non-AA is the self-selected group, that is made of firms that joined the MGI after 2008 to access the MR. Differences among these groups highlight the role of self-selection. The treated, non-AA group displays a

larger jump in the share of long-term debt in 2009 and a more moderate decrease afterwards. The AA group is characterized instead by a smaller increase at the start of the policy and a faster regression toward pre-treatment values.

Overall, the comparison among different estimation techniques suggest that the IV estimates have a better performance in dealing with selection issues. For this reasons, in the rest of the paper, we will present the IV estimates only.

### 4.2 Robustness checks

The robustness check relates to data construction. As explained in section 3.3, the share of long-term debt is set to zero if the firm did not have bank debt (that is, the company is not in the CR dataset). As long as this feature is not related to the treatment status of the firm, the imputation should not affect the estimation of $\beta$ thanks to the properties of the diff-in-diffs estimator. In table 7 we check this issue by eliminating all imputed values: despite the drop in the number of observations, the point estimates in all regressions are similar to the baseline ones, especially in the first two years after the start of the policy.

We then provide evidence supporting the validity of the common trend assumption. As we argued in the previous sections, differences in the past levels of the dependent variable are coped with the diff-in-diffs estimator and with the reweighting procedures; however, if trends in the share of long-term debt are diverging between treated and non-treated units, the estimates of $\beta$ might be biased. Figure 2 has already shown that common trend before the treatment is respected, especially for IV estimates. To confirm the graphical intuition, we implement a placebo test running equation (1) in the pre-intervention period (2004-08); for each couple of consecutive years (2004-05, 2005-6, ...), we use the second period as the (fictional) year of the introduction of the policy. Panels (A) of table 8 show that common trend assumption is respected.

We further investigate the robustness of the IV results by analyzing the role of the exclusion restriction hypothesis. As we said in section 3, the validity of

the instrumental variable approach crucially depends on the hypothesis that the AA-status *per se* does not influence credit access. We check the issue in two ways. First, we exploit the fact that the AA-status does not necessarily imply that the firm actually used the MGI guarantee to access the credit market. Using the information on guarantees in the CR dataset, we are able to exclude from the analysis all firms that used the MGI guarantee in the period just before the start of the crisis (2006-07). The instrument is now a dummy variable equal to one if the firm belonged to the AA group *and* did not use the MGI guarantee to receive a loan.[11] Results in Panel (B) of table 8 confirm baseline findings; the point estimates are now even slightly larger thus suggesting that the baseline results are driven by the subset of firms and not vice-versa.

Panel (C) of table 8 presents an additional test on the exclusion restriction. While systematic differences in observables between AA and non-AA firms are controlled with the reweighting procedure, there could be still other sources of unobservable heterogeneity between the two groups; for example, MGI members are frequently characterized by a less–than–perfect credit history. While this feature could not be a major problem before 2008 (as the previous paragraph suggests), it may hamper credit access during a financial crisis. To check this issue, we analyze the impact of the MGI affiliation for a set of firms that – while facing roughly similar credit conditions – did not have the possibility to apply to the MR. We analyze, in particular, whether the AA status in the nearby region of South Tyrol had an impact on the share long-term debt. Before the crisis, South Tyrol and Trentino shared similar economic characteristics and were characterized by nearly identical credit markets features (Bank of Italy, 2019). We run equation (1) on a sample of firms located in South Tyrol and $\beta$ is now the coefficient for the AA-status (that is, for a dummy equal to one if the firm was affiliated to a South-Tyrolean MGI before 2008). Details on the reweighting procedure are presented in Appendix C. Results show that – in South Tyrol – AA and non-AA firms did not display any change in

[11] In the dataset, there are 60 firms with these characteristics.

the debt composition in the financial crisis period. This is quite reassuring about the fact that the MGI affiliation, *per se*, did not have any impact on debt maturity.

### 4.3 Mechanisms

We now want to understand to what extent the results we have found are related to variations in the numerator or the denominator of the share of long term debt. Table 9 presents the estimates for $\beta$ by using as a dependent variable, respectively, the log of long-term debts ($log(Debts_{LT})$, the numerator) and the log of total debts ($log(Debts_{TOT})$, the denominator).

Panels (A) shows the results on $log(Debts_{LT})$: according to the estimates, MR generated an increase of long-term debt by 26 percentage points more pronounced with respect to the control group in the first year; however, the effect disappears from 2011 on.

In panel (B) the dependent variable is $log(Debts_{TOT})$. Estimation results show no effects on total debts even in the short run.

Overall, results in table 9 demonstrate that for many firms MR loans were used for financial restructuring purposes, that is, to repay more expensive short-term debts.

## 5 Effects on firm performance

So far we have consistently showed that MR was quite successful, in first two years, in raising the share of long-term debt for treated firms. The fact that the effect rapidly disappears at the beginnings of the third year after the treatment seems to suggest that – contrary to the policy makers' beliefs – firms' debt maturity was not suboptimally short. The aim of this section is to analyze whether the change in debt maturity induced by the policy determined an impact on other firm level variables. As a comparison, Appendix C provides the same estimation results for the South-Tyrolean sample (where no policies were at work).

### 5.1 Real effects

MR was mostly used by firms for financial restructuring; the policy induced the firms to repay more expensive short-term debt by using long-term subsidized loans. The reduction in the interests paid could determine an increase either in the input factor accumulation or in profitability[12].

To check this issue Panels (A), (B) and (C) of Table 10 show the results when we use log of total assets, tangible, and intangible assets, respectively, as dependent variables.[13] After the first year, the stock of total assets of the treated units has increased by 7 percentage points more with respect to the control group but the effect is not statistically significant; the increase for tangible assets is similar (8.5 p.p.) and still not statistically significant. The rise for the intangible assets is stronger (24 p.p.) and it is statistically different from zero. The effect for the intangible asset is still sizable but more imprecise after the second year while it disappears from 2011. A possible reason for the fading-out of the effect is that many intangible investments (like softwares or training courses for employees) are generally characterized by high depreciation. Indeed, according to the Italian accounting law, depreciation rates for goods included in the intangible assets varies from 33% (three years) to 50% (two years).

Panel (D) shows the impact of MR on firm employment. CG dataset does not include information on the number of employees but we proxy it with the labor cost. The impact of MR on this variable is not statistically different from zero.

The overall impact on input factor accumulation is not surprising. As we have see, firms strategically used the MR to raise debt maturity for a relatively short period; they were expecting that the interest rates reductions were limited in time

[12] Unfortunately, in the present work, we cannot provide an evaluation of the credit cost reduction related to the policy as we are not able to fully exploit the information on interest rates. This is due to the fact that the survey on the cost of credit (the so-called *Rilevazione analitica dei tassi di interesse*, a subsection of CR which contains information on interest rates, fees, and commissions charged on different types of loans) is not conducted on minor financial institutions (small cooperative banks mainly) which, in Trentino, have a large market share, especially among small firms (see Subsection 2.1).

[13] All variables regarding assets are net of depreciation.

and – considering the Italian labor market firing rigidities – did not decide to hire additional workers but rather accumulate high-depreciation assets.

We then turn to output measures. In principle the accumulation of intangible assets may improve firms' ability to compete on the market. We test whether the increase in the share of long-term debt induced by MR determined a rise in the sales. Results in table 11, panel (A) seem to suggest that this is not the case. Sales for treated firms rose by 4 p.p. more compared with the control group but the parameter is not statistically significant; this small effect disappears after the second year and with a change in sign.

Panel (B) shows instead that Return on Equity (ROE) rose in the first year and, especially, in the second year. Not surprisingly, the effect is stronger in the second year when the effects on investments are more limited. Once the effect of the MR policy became weaker (from 2011 on), profitability ceased to be different between treated and control groups.

### 5.2 Credit market effects

As we have seen, the (two-years long) increase in debt maturity had a limited effect on firm performance. Despite this disappointing result, it is still possible that MR had a positive effect on firms' ability to operate in the credit market by increasing, for example, its bargaining power vis-a-vis the banking system.

The literature on the topic offers mixed indications. On one hand, Bolton and Scharfstein (1996) show that debt structure has an impact on firms' number of creditors and, in general, credit access. On the other, the huge literature on relationship lending indicates that more opaque firms have a better access to the credit market if they are able to establish long-tem, trust-based relationships with a single bank (Petersen and Rajan (1994), Berger and Udell (1995)).

We assess whether the policy had an impact on the number of banks a firm is borrowing from, on how much concentrated is borrowing from different banks (Herfindhal), and finally on the share of the main bank.

Results from panels (A), (B), and (C) of table 12 suggest that, on average, firms used used the opportunity to access the MR to modify their relationships with the banking system. In the first year of the policy (2009), the number of banks rose by 0.45 units; in the following years, the effect becomes insignificant and also changes the sign. There is a slight decrease in the Herfindhal index in the first year (probably due to the increase in the number of banks) and no effects on the share of main bank.

The fact that the impact on the number of banks already disappears in the second year (when treatment on maturity is still at work) indicates that the policy was used by firms as a switching device, by repaying short-term loans with some banks and opening long-term ones with others. In the first year, both loans were registered by the CR as "active" and, as a consequence, the number of banks has increased. However, since there is no evidence of market imperfections on debt maturities, the share of main bank indicator does not seem to be affected by the policy.

We finally check if the changes brought about by the MR have contributed to alter the credit riskiness of the firms.

The intended target of the policy was to increase firms' debt maturity to allow companies to survive the great recession. The fact that – at least the first two years – the policy was successful in raising the share of long-term debt indicates that maybe MR succeeded in lowering treated companies' riskiness.

However, there are some features of the implementation of the policy that may generate a less optimistic view. The first is that, as we have seen, treated firms observed a sharp decrease in the share of long-term debt after the initial increase. This determined a rise in the interest rates to be paid on new debt that was substituting the guaranteed loans; as suggested by He and Milbradt (2016), this dynamics could have changed rollover costs to the point that firms may have modified their default policy. The second reason relates to the crucial role played by MGIs in the design of the policy. As shown in the literature review in the introduction, public

guarantees could increase moral hazard as they reduce actual risk faced by both lenders and borrowers.

Estimates reported in table 13 show that MR increased the probability of default by treated firms. We analyze the impact of MR on the quality of credit by using, as a dependent variable, a dummy equal to one whether the firm reported either a bad (Panel (A)) or a non-performing loan (NPL, Panel (B)) after the start of the policy.[14] Results indicate a sharp deterioration of the quality of credit to treated firms; starting from 2010, treated firms experienced an increase in the probability to be registered as a bad loan or as a NPL. The rise is substantial: considering bad loans only, MR generated a rise in the share of bad loans by more than 17 percentage points in 2012; the impact for NPL is 12 percentage points.

# 6 Discussion of the results and conclusions

Firms' financial fragility is often considered as a major weakness for the Italian economy; asymmetric information in credit markets may determine a high share of short-term debt which is regarded as an obstacle for long-term investment plans. At the start of the financial crisis, the local Government of the Province of Trento launched an innovative policy aimed at improving firms' financial conditions and, in particular, debt maturity. The MR policy allowed firm to borrow long-term subsidized loans; new credit lines could be used for either investment decisions or to repay short-term pre-existing loans.

In this paper we analyze this policy. We first evaluate whether MR was successful in increasing the share of long-term debt. Then we study whether the exogenous increase in debt maturity had consequences for firm performance.

Our results for the evaluation part are quite mixed. By using our most reliable estimates, we find that the share of long term debt rose by 10 percentage points after the first year but the effect was not permanent. After four years from the start

[14] NPLs are a broader category that include bad loans and other, less severe, anomalies (unlikely to pay, overdrawn, past dues). Note that basically no firms reported any anomaly before the start of the policy.

of the policy, the treatment effect disappears. The fact that the effect of the policy was not permanent may hint that debt maturity was not suboptimally short.

In terms of firm performance our estimates are even less optimistic. Debt restructuring was mostly used for the accumulation of intangible assets with high depreciation rates; however, these investments did not have relevant effects in terms of sales, while it increased, for a short period, firm profitability. Moreover, our results offer evidence in support of a moral hazard behavior related to credit guarantees.

While the generalization of these results must be taken with the grain of salt (considering, for example, the fact that the policy was applied in small region under exceptional macroeconomic circumstances), we deem that these findings are interesting to inform the debate on financial fragility and growth, a topic with relevant consequences in terms of policy implications. In particular, we show that probably there were no relevant market distortions that determined a suboptimally short debt maturity; we also show that debt maturity *per se* does cause firm growth and this is a relevant step forward for a literature that has struggled to find causal relationships.

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# A The functioning of Mutual Guarantee Institutions in Italy

MGIs are financial institutions that provide loan guarantees to their members; the latter are generally small and medium enterprises (SMEs), that typically have more difficulty in obtaining credit by banks.

The aim of MGIs is to facilitate the access to credit by their members whenever they have projects that are considered to be economically sound but entrepreneurs cannot provide enough collateral: by sharing information about the firm with banks, MGIs help reducing the asymmetry of information between the lender and the possible borrower.

The guarantee is a financial commitment by the MGI to repay part of the loan if the guaranteed firm is not able to honor its debt.

MGIs generally operate in all the countries of the Euro area but are particularly relevant in Italy. Before the crisis, roughly half of the guarantees by Eurozone MGIs were from Italy.

In Italy MGIs are private institutions (consortia or cooperatives), generally established by business associations; however, the role of public and semi-public funding – provided by central and local government authorities as well as Chambers of Commerce – is crucial for their functioning. The number of public measures aiming at supporting SMEs through the intervention of MGIs have been increased over the crisis and the number of SMEs affiliated to a MGI has increased accordingly (Carosio, 2011).

At the end of 2009, about 13 per cent of bank credit granted to small enterprises (i.e. with less than 20 employees) were guaranteed by MGIs (Mistrulli et al., 2011).

The affiliation to a MGI entails the payment of a fixed cost that is the purchase of one share of the institution plus negligible administrative costs. For the MGIs operating in Province of Trento fixed cost amounted to 300 euros in 2009. Note that the affiliation is necessary to ask for a MGI's guarantee but being affiliated does not necessarily imply that the guarantee is used. When the guarantee is used, an additional fee (proportional to the value of the guarantee) has to be paid and it is calculated as a premium on the interest rate.

The diffusion of the MGI guarantee was slightly more pronounced in the Province of Trento compared with the rest of the country; this is generally interpreted as a measure of a larger endowment of social capital (Mistrulli and Vacca, 2015). In 2007, 6.4% of the values of all loans was guaranteed by a MGI (4.8% in the national average). This percentage has slightly increased during the first part of the crisis; in Trentino it skimmed 8.8% in 2009 (5.2% in Italy) and 7.4% in 2012 (5.6% the national average).

# B Data construction

Datasets:
**CR**. Central Credit Register.
**CG**. Cerved Group.

For the empirical analysis we used the following variables:

1. **Bad loans**. Source: CR. Dummy equal to one if the firm reported a bad loan in the three subsequent years. This means that the dummy is equal to one in 2009 if the bad loan was reported in the period 2009-2011. This definition, on a "rolling" basis, is due to the fact that bad loans are generally registered with delays (at most, three years) by the banking system in CR.

2. **Debt/Assets**. Source: CR and CG. Calculated as the ratio between total bank debts (as reported in CR) and total assets (as reported in CG). In the selection process (balancing properties and estimates of the propensity score) the variable is averaged on the pre-treatment period (2004-07). The numerator is imputed with zeros when it is missing.

3. **Growth sh. of long term debt**. Source: CR. Calculated as the difference between year $t$ and $t-1$ of the ratio computed at point 1. In the selection process (balancing properties and estimates of the propensity score) the variable is averaged on the pre-treatment period (2004-07).

4. **Herf. bank loans**. Source: CR. Calculated as the Herfindhal index of bank loans in a certain year. For each firm having a relationship with $B$ banks this is calculated as $\sum_{b=1}^{B} s_b^2$, $b$ is the bank, $s_b = \dfrac{Debt_b}{Debt_{TOT}}$ is the share of loans from bank $b$ over total debt $Debt_{TOT}$. The variable equals to one when loans come from one bank only, while it tends toward zero when credit is equally distributed across banks. The variable is set to zero for firms with no bank relationship. In the selection process (balancing properties and estimates of the propensity score) the variable is averaged on the pre-treatment period (2004-07). When it is used as a dependent variable it refers to the period 2008-2012.

5. **ln(Assets)**. Source: CG. Calculated as the natural logarithm of total assets. In the selection process (balancing properties and estimates of the propensity score) the variable is averaged on the pre-treatment period (2004-07). When it is used as a dependent variable it refers to the period 2008-2012.

6. **ln(Intangible Assets)**. Source: CG. Calculated as the natural logarithm of intangible assets. These include non-physical assets such as patents, franchises, goodwill, copyrights, service contracts, computer softwares, or training courses for employees. The variable is used as a dependent variable over the period 2008-2012.

7. **ln(Labor cost)**. Source: CG. Calculated as the natural logarithm of labor cost. The variable is used as a dependent variable over the period 2008-2012.

8. **ln(Sales)**. Source: CG. Calculated as the natural logarithm of total sales. In the selection process (balancing properties and estimates of the propensity score) the variable is averaged on the pre-treatment period (2004-07). When it is used as a dependent variable it refers to the period 2008-2012.

9. **ln(Tangible Assets)**. Source: CG. Calculated as the natural logarithm of tangible assets. These include physical assets such as land, vehicles, equipments, machineries, furnitures, or inventories. The variable is used as a dependent variable over the period 2008-2012.

10. **No. Banks**. Source: CR. Calculated as the number of banks toward a firm is exposed with performing loans in a certain year. The variable is set to zero if firms appear to have no bank loans in that that year. In the selection process (balancing properties and estimates of the propensity score) the variable is averaged on the pre-treatment period (2004-07). When it is used as a dependent variable it refers to the period 2008-2012.

11. **Non-performing loans**. Source: CR. Dummy equal to one if the firm reported a non-performing loan (bad loan, unlikely-to-pay, overdrawn, or past due) in the three subsequent years. This means that the dummy is equal to one in 2009 if the NPL was reported in the period 2009-2011. This definition, on a "rolling" basis, is due to the fact that NPLs are generally registered with delays (at most, three years) by the banking system in CR.

12. **ROE**. Source: CG. Calculated as the ratio between after-taxes returns and total equity. In the selection process (balancing properties and estimates of the propensity score) the variable is averaged on the pre-treatment period (2004-07). When it is used as a dependent variable it refers to the period 2008-2012.

13. **Share long term debt**. Source: CR. Calculated as the ratio between long term bank debt (above 18 month, according to the CR definition) and total debt. We consider debts toward all banks and financial institutions reporting to CR. Both numerator and denominator are imputed with zeros when they are missing. When both are zero, the ratio is set to zero. In the selection process (balancing properties and estimates of the propensity score) the variable is averaged on the pre-treatment period (2004-07). When it is used as a dependent variable it refers to the period 2008-2012.

14. **Sh. main bank**. Source: CR. Calculated as the share of loans coming from the main bank: $\frac{Debt_{main}}{Debt_{TOT}}$ where $Debt_{main}$ is the value of the loans from the main bank. The variable is set to zero for firms with no bank relationship. In the selection process (balancing properties and estimates of the propensity score) the variable is averaged on the pre-treatment period (2004-07). When it is used as a dependent variable it refers to the period 2008-2012.

# C Placebo exercise for South Tyrol

In order to better justify the exclusion restriction, we analyze the role of the MGI membership on the share of long-term debt for the firms located in South Tyrol. The analysis is similar to the one for the companies in Trentino:

$$y_{it} = \alpha_i + \beta AA_{it} + \delta_t + \varepsilon_{it} \tag{2}$$

where $AA_{it}$ is a dummy equal to one if firm $i$ joined a local MGI before 2008.[15] Equation (2) is estimated by OLS; we reweight the observations with the aim to ensure the similarity between AA and non-AA firms. The procedure is the same that we described in section 3.

We first run a logit regression using the AA-status as dependent variable on averaged pre-treatment variables. Estimated values (propensity scores) are subsequently used to reweight observations in the estimation of equation (2).

The distribution of the propensity scores shows a satisfactory overlap between the two groups as shown in figure A.1.

The reweighting procedure also works well in eliminating all observable differences between the two groups as shown in table A.1.

We also analyze the impact of the MGI membership in South Tyrol on firms' performance. We re-estimate equation (2) using – as dependent variables – the outcome variables in tables 10, 11, 12, and 13.

Results are displayed in tables A.2, A.3, A.4, and A.5. As expected, MGI membership in South Tyrol did not have any impact on firms' performance, thus reifoncing the causal interpretation of our baseline IV estimates.

[15] More precisely, $AA_{it}$ is equal to zero for all firms at $t = 0$ and is equal to one at $t = 1$ for firms already part of a MGI before the crisis. We consider the most important MGI in South Tyrol *Confidi Alto Adige*.

Table 1: Firms by type

| | Non-AA | AA | Total |
|---|---|---|---|
| Non-Treated | 3763 | 0 | 3763 |
| Treated | 226 | 204 | 430 |
| Total | 3989 | 204 | 4193 |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Treated firms are firms that received the MR loans. AA firms are those that joined a MGI before 2008.

Table 2: Balancing properties

| | Treated | Non-Treated | Mean Differences |
|---|---|---|---|
| $ln(Sales)$ | 7.322 | 6.367 | 0.954*** |
| | [1.307] | [1.799] | (0.069) |
| $ln(Assets)$ | 7.543 | 6.655 | 0.888*** |
| | [1.144] | [1.619] | (0.061) |
| ROE | -4.068 | 4.451 | -8.520 |
| | [175.903] | [570.224] | (12.677) |
| Debt/Assets | 0.471 | 0.325 | 0.145*** |
| | [0.282] | [0.630] | (0.017) |
| Sh. long term debt | 0.463 | 0.372 | 0.105*** |
| | [0.289] | [0.383] | (0.015) |
| Growth Sh. long term debt | -0.005 | -0.005 | 0.000 |
| | [0.109] | [0.167] | (0.006) |
| No. Banks | 3.358 | 1.687 | 1.671*** |
| | [2.814] | [2.532] | (0.141) |
| Herf. bank loans | 0.530 | 0.498 | 0.031** |
| | [0.284] | [0.381] | (0.015) |
| Sh. main bank | 0.607 | 0.530 | 0.077*** |
| | [0.272] | [0.386] | (0.014) |
| No. Obs. | 431 | 3652 | |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Standard deviations in squared brackets, robust standard errors in parenthesis. *** p<0.01, ** p<0.05, * p<0.1. Treated firms are firms that received the MR loans. For the definition of each variable see Appendix B.

Table 3: Analysis of variance

| | Dep. var.: share of long term debt | | | | |
|---|---|---|---|---|---|
| ln(Assets) | Y | Y | Y | Y | Y |
| Debt/Assets | N | Y | Y | Y | Y |
| ROE | N | N | Y | Y | Y |
| Sh. main bank | N | N | N | Y | Y |
| Sector dummies | N | N | N | N | Y |
| $R^2$ | 0.11 | 0.22 | 0.22 | 0.48 | 0.51 |
| No. Obs. | 4,083 | 4,083 | 4,083 | 4,083 | 4,083 |

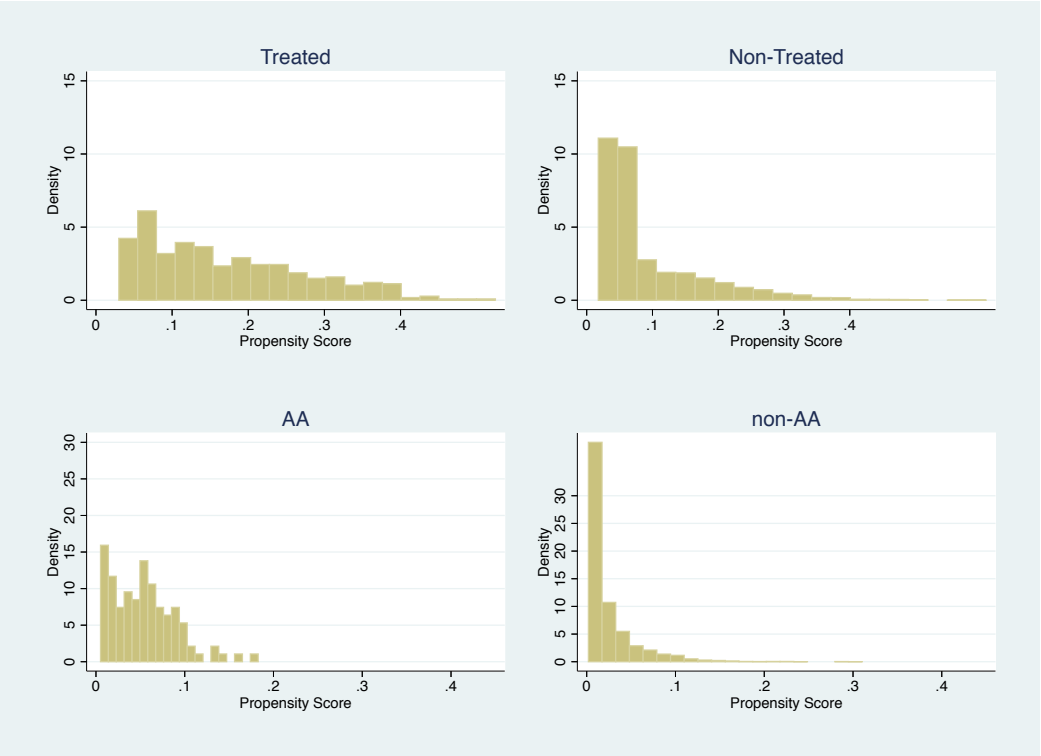
*Notes*: Authors' calculations on Credit register/Province of Trento dataset. OLS estimation results. For the definition of each variable see Appendix B.

Table 4: Propensity score results

| Dep. var. | T | AA |
|---|---|---|
| $ln(Sales)$ | 0.094** | 0.125** |
| | [0.047] | [0.057] |
| $ln(Assets)$ | 0.042 | 0.078 |
| | [0.056] | [0.068] |
| ROE | 0.000 | 0.000 |
| | [0.000] | [0.000] |
| Debt/Assets | 0.105** | 0.155** |
| | [0.049] | [0.050] |
| Sh. long term debt | -0.159 | 0.082 |
| | [0.172] | [0.252] |
| Growth Sh. long term debt | 0.131 | -0.200 |
| | [0.284] | [0.394] |
| No. Banks | -0.011 | -0.003 |
| | [0.022] | [0.025] |
| Herf. bank loans | -13.198*** | -12.850*** |
| | [1.160] | [1.513] |
| Sh. main bank | 13.789*** | 12.267*** |
| | [1.187] | [1.522] |
| Cons | -4.094*** | -4.918*** |
| | [0.247] | [0.310] |
| No. Obs. | 4193 | 4193 |
| Pseudo-$R^2$ | 0.106 | 0.115 |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Robust standard errors in squared brackets. *** p<0.01, ** p<0.05, * p<0.1. Logit estimates. Treated firms are firms that received the MR loans. AA firms are those that joined a MGI before 2008. For the definition of each variable see Appendix B.

Figure 1: Distribution of propensity scores



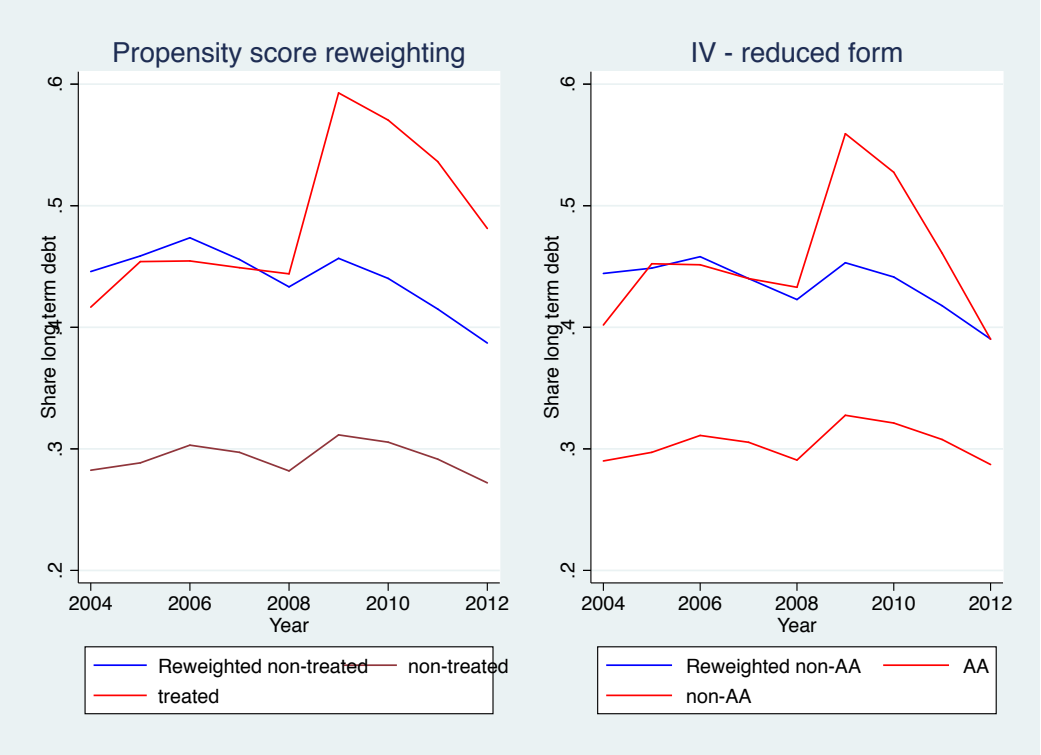

Notes: Authors' calculations on Credit register/Province of Trento dataset. Propensity scores computed by logit estimations, see table 4, by using, as dependent variables, T for the top panel and AA for the bottom panel. Treated firms are those that received the MR loans. AA firms are those that joined a MGI before 2008.

Table 5: Balancing properties after reweighting

| | Treated | Non-Treated | Mean Differences | AA | Non-AA | Mean Differences |
|---|---|---|---|---|---|---|
| $ln(Sales)$ | 7.288 | 7.403 | -0.115 | 7.600 | 7.592 | 0.008 |
| | [1.371] | [1.757] | (0.079) | [1.296] | [1.805] | (0.100) |
| $ln(Assets)$ | 7.526 | 7.650 | -0.123* | 7.798 | 7.785 | 0.012 |
| | [1.147] | [1.545] | (0.067) | [1.182] | [1.634] | (0.092) |
| ROE | -5.164 | -4.382 | -0.782 | -1.401 | -0.082 | -1.318 |
| | [179.774] | [701.264] | (17.350) | [128.299] | [624.220] | (15.010) |
| Debt/Assets | 0.468 | 0.497 | -0.028 | 0.473 | 0.490 | -0.016 |
| | [0.286] | [0.992] | (0.034) | [0.287] | [1.152] | (0.049) |
| Sh. long term debt | 0.458 | 0.484 | -0.026* | 0.456 | 0.468 | -0.012 |
| | [0.297] | [0.337] | (0.015) | [0.284] | [0.334] | (0.020) |
| Growth Sh. long term debt | -0.003 | -0.002 | -0.000 | -0.009 | -0.009 | 0.000 |
| | [0.112] | [0.152] | (0.006) | [0.092] | [0.132] | (0.006) |
| No. Banks | 3.303 | 3.491 | -0.187 | 4.000 | 3.990 | 0.009 |
| | [2.812] | [3.375] | (0.163) | [3.344] | [4.071] | (0.263) |
| Herf. bank loans | 0.530 | .551 | -0.020 | 0.444 | 0.453 | -0.009 |
| | [0.290] | [0.280] | (0.014) | [0.273] | [0.278] | (0.019) |
| Sh. main bank | 0.606 | 0.630 | -0.024* | 0.528 | 0.538 | -0.010 |
| | [0.278] | [0.266] | (0.014) | [0.272] | [0.281] | (0.019) |
| No. Obs. | 430 | 3763 | | 204 | 3989 | |

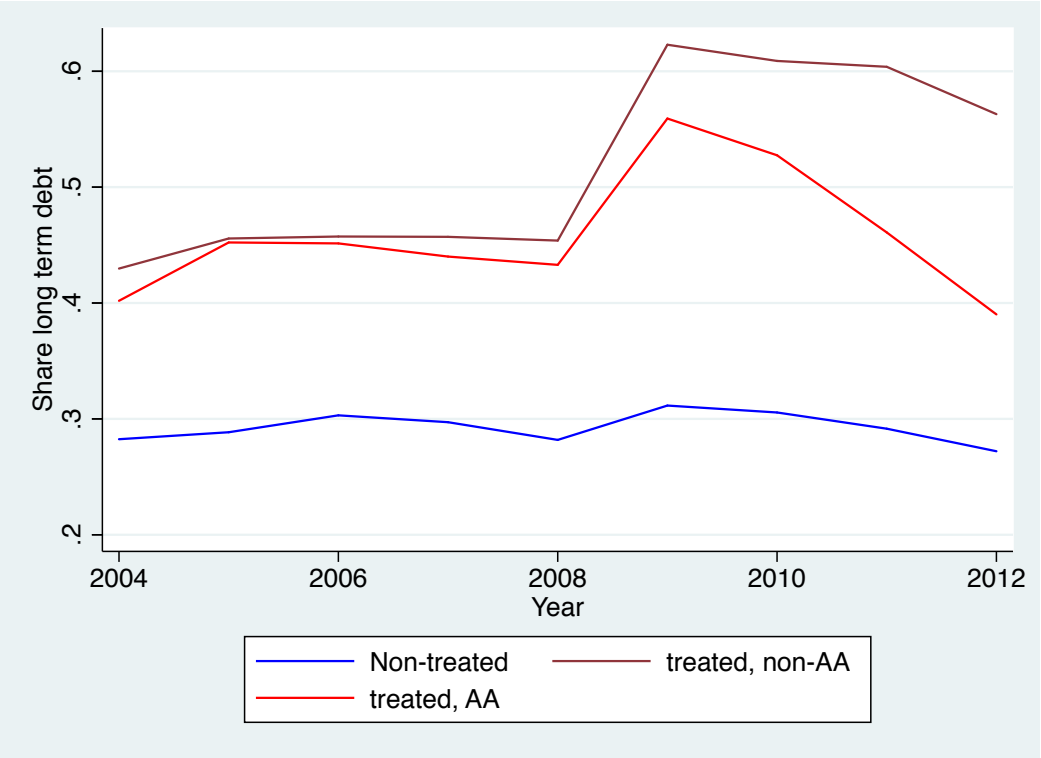
*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Standard deviations in squared brackets, robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Treated firms are firms that received the MR loans. AA firms are those that joined a MGI before 2008. For the definition of each variable see Appendix B. Non-treated units are weighted by $\frac{\rho(x)}{1-\rho(x)}$, where $\rho(x)$ is the propensity score computed in the regression of the first column of table 4. Non-AA units are weighted by $\frac{\rho(x)}{1-\rho(x)}$, where $\rho(x)$ is the propensity score computed in the regression of the second column of table 4. See section 3 for details.

Figure 2: Graphical results




Notes: Authors' calculations on Credit register/Province of Trento dataset. Average shares of long term debt by type of firm. **Left Panel**. "non-treated" are the non-weigthed non-treated observations. "Reweighted non-treated" are the reweighted non-treated observations. "treated" are the treated observations. Treated firms are firms that received the MR loans. **Right Panel**. "non-AA" are the non-weigthed non-AA observations. "Reweighted non-AA" are the reweighted non-AA observations. AA are the AA observations. AA firms are those that joined a MGI before 2008.

Figure 3: Graphical results - IV - sample split




Notes: Authors' calculations on Credit register/Province of Trento dataset. Average shares of long term debt by type of firm. $T = 0, AA = 0$ are the non-treated observations. $T = 1, AA = 1$ are the treated and AA observations. $T = 1, AA = 0$ are the treated, non-AA observations. Treated firms are firms that received the MR loans. AA firms are those that joined a MGI before 2008. All averages are not weighted.

Table 6: Baseline

| | (A) OLS | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.1224*** | 0.1063*** | 0.0864*** | 0.0507*** |
| | [0.0139] | [0.0161] | [0.0174] | [0.0186] |
| $R^2$ | 0.045 | 0.021 | 0.007 | 0.002 |
| Obs | 8386 | 8386 | 8386 | 8386 |
| | (B) Propensity score reweighting | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.1254*** | 0.1195*** | 0.1106*** | 0.0835*** |
| | [0.0141] | [0.0166] | [0.0179] | [0.0192] |
| $R^2$ | 0.146 | 0.077 | 0.037 | 0.013 |
| Obs | 7734 | 7734 | 7734 | 7734 |
| | (C) IV | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.1064*** | 0.0842*** | 0.0366 | -0.0114 |
| | [0.0202] | [0.0246] | [0.0272] | [0.0286] |
| $R^2$ | 0.132 | 0.054 | 0.006 | 0.011 |
| Obs | 8166 | 8166 | 8166 | 8166 |
| First stage | 0.902*** | 0.902*** | 0.902*** | 0.902*** |
| | (0.008) | (0.008) | (0.008) | (0.008) |
| F-statistics | 11757.02 | 11757.02 | 11757.02 | 11757.02 |

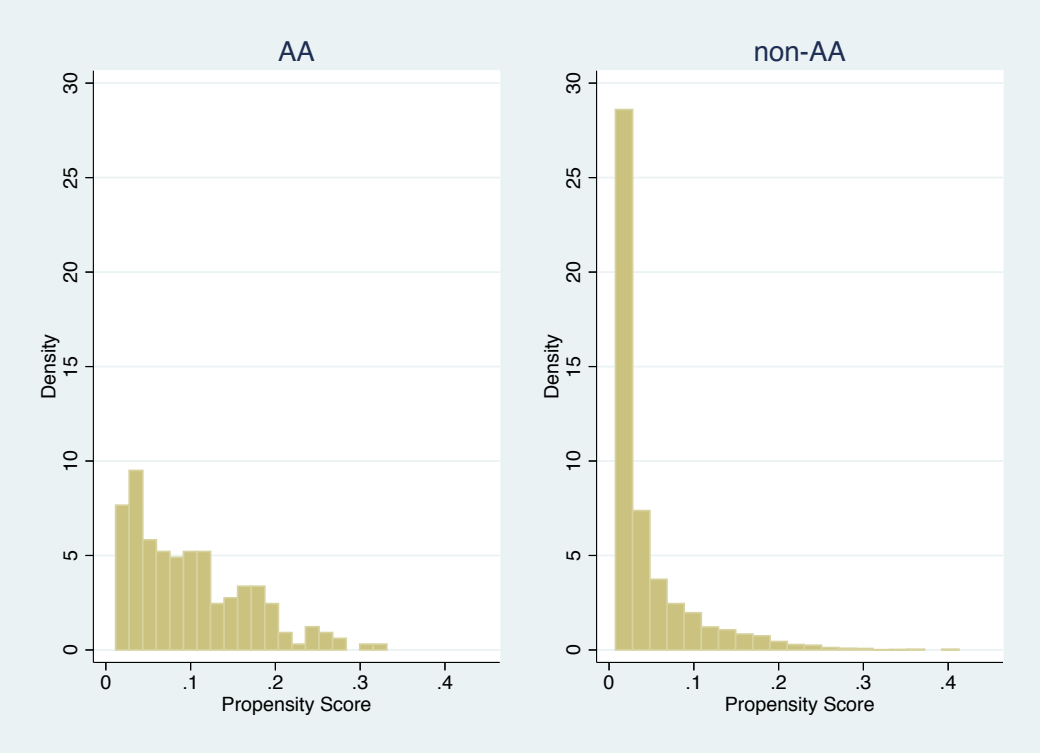
*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta T_{it} + \delta_t + \varepsilon_{it}$, see section 3. Dependent variable: share of long term debt. $T_{it}$ is a dummy equal to one for treated firms after 2008 and zero otherwise. All regressions include time dummies. **Panel (A)**. OLS estimates. **Panel (B)**. Weighted OLS estimates, weights are computed using propensity scores estimates, see table 4 col. (1). See section 3 for details. **Panel (C)**. Weighted IV estimates, where treatment is instrumented with the participation to a MGI before 2008; weights are computed using propensity scores estimates, see table 4 col. (2). See section 3 for details.

Table 7: Robustness: excluding imputed values

| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
|---|---|---|---|---|
| $\beta$ | 0.0956*** | 0.0809*** | 0.0536* | 0.0395 |
| | [0.0216] | [0.0245] | [0.0275] | [0.0288] |
| $R^2$ | 0.190 | 0.157 | 0.093 | 0.045 |
| Obs | 5272 | 5024 | 4750 | 4592 |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta T_{it} + \delta_t + \varepsilon_{it}$, see section 3. Dependent variable: share of long term debt. $T_{it}$ is a dummy equal to one for treated firms after 2008 and zero otherwise. All regressions include time dummies. Weighted IV estimates, where treatment is instrumented with the participation to a MGI before 2008 (AA status); weights are computed using propensity scores estimates, see table 4 col. (2). See section 3 for details. All regressions exclude imputed values.

Figure A.1: Distribution of propensity scores




Notes: Authors' calculations on Credit register dataset. Propensity scores computed by logit estimations by using, as dependent variables, the AA status. AA firms are those that joined a MGI before 2008.

Table 8: Robustness: Common Trend and Exclusion Restriction

| | (A) Common Trend | | | |
|---|---|---|---|---|
| | 2004-05 | 2005-06 | 2006-07 | 2007-08 |
| $\beta$ | 0.0509** | -0.0113 | 0.0073 | 0.0113 |
| | [0.0218] | [0.0179] | [0.0144] | [0.0144] |
| $R^2$ | 0.017 | 0.001 | 0.006 | 0.004 |
| Obs | 8166 | 8166 | 8166 | 8166 |
| | (B) Using firms with direct access to credit | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.1299*** | 0.1261*** | 0.1169** | 0.0858* |
| | [0.0440] | [0.0433] | [0.0473] | [0.0477] |
| $R^2$ | 0.090 | 0.055 | 0.029 | 0.017 |
| Obs | 7880 | 7880 | 7880 | 7880 |
| | (C) MGI-affiliated in South Tyrol | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0348 | 0.0434 | 0.0486 | 0.0540* |
| | [0.0239] | [0.0266] | [0.0303] | [0.0324] |
| $R^2$ | 0.013 | 0.008 | 0.005 | 0.014 |
| Obs | 5390 | 5390 | 5390 | 5390 |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta T_{it} + \delta_t + \varepsilon_{it}$, see section 3. Dependent variable: share of long term debt. Weighted IV estimates, where treatment is instrumented with the participation to a MGI before 2008 (AA status); weights are computed using propensity scores estimates, see table 4 col. (2). See section 3 for details. All regressions include time dummies. **Panel (A)**. Test for common trend assumption. For each column, placebo treatment years are, respectively, 2005, 2006, 2007, and 2008. **Panel (B)**. In the construction of the instrument, we exclude all AA firms that – in the period 2006-07 – used the MGI guarantee to access the credit market. **Panel (C)**. Placebo excercise for South Tyrol. See Appendix C for details.

Table 9: Effects on numerator and denominator

| | Dependent variable: $log(Debts_{LT})$ | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.2574*** | 0.1964*** | 0.0879 | 0.1428 |
| | [0.0576] | [0.0762] | [0.1000] | [0.0995] |
| $R^2$ | 0.092 | 0.049 | 0.008 | 0.005 |
| Obs | 3772 | 3514 | 3292 | 3104 |
| | Dependent variable: $log(Debts_{TOT})$ | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0427 | 0.0522 | -0.0333 | -0.0288 |
| | [0.0460] | [0.0624] | [0.0760] | [0.1078] |
| $R^2$ | 0.004 | 0.009 | 0.010 | 0.015 |
| Obs | 4760 | 4492 | 4228 | 4078 |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta T_{it} + \delta_t + \varepsilon_{it}$, see section 3. $T_{it}$ is a dummy equal to one for treated firms after 2008 and zero otherwise. Weighted IV estimates, where treatment is instrumented with the participation to a MGI before 2008; weights are computed using propensity scores estimates, see table 4 col. (2). See section 3 for details. All regressions include time dummies. **Panel (A)**. Dependent variable: log of long term debt. **Panel (B)**. Dependent variable: log of total debt.

Table 10: Effects on firm performance: input

| | (A) Dependent variable: $log(Assets)$ | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0656 | 0.0586 | 0.0692 | -0.0448 |
| | [0.0718] | [0.0864] | [0.1009] | [0.1084] |
| | (B) Dependent variable: $log(Tangible\ Assets)$ | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0854 | 0.1294 | 0.1477 | 0.0979 |
| | [0.0722] | [0.1005] | [0.1147] | [0.1315] |
| | (C) Dependent variable: $log(Intangible\ Assets)$ | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.2397** | 0.2147 | -0.0372 | -0.1814 |
| | [0.1181] | [0.1332] | [0.1859] | [0.2050] |
| | (D) Dependent variable: $log(Labor\ Cost)$ | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | -0.0462 | -0.0445 | -0.1251 | -0.1181 |
| | [0.0442] | [0.0526] | [0.0986] | [0.1056] |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta T_{it} + \delta_t + \varepsilon_{it}$, see section 3. $T_{it}$ is a dummy equal to one for treated firms after 2008 and zero otherwise. All regressions include time dummies. Weighted IV estimates, where treatment is instrumented with the participation to a MGI before 2008; weights are computed using propensity scores estimates, see table 4 col. (2). See section 3 for details. **Panel (A)**. Dependent variable: log of total assets. **Panel (B)**. Dependent variable: log of tangible assets. **Panel (C)**. Dependent variable: log of intangible assets. **Panel (D)**. Dependent variable: log labor cost. For the definition of each variable see Appendix B.

Table 11: Effects on firm performance: output

| | (A) Dependent variable: $log(Sales)$ | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0411 | -0.0168 | -0.1141 | -0.0403 |
| | [0.0396] | [0.0672] | [0.1168] | [0.0993] |
| | (B) Dependent variable: ROE | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 19.6747 | 30.5731* | 9.7051 | 10.4725 |
| | [15.4827] | [16.8927] | [18.7220] | [18.3093] |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta T_{it} + \delta_t + \varepsilon_{it}$, see section 3. $T_{it}$ is a dummy equal to one for treated firms after 2008 and zero otherwise. All regressions include time dummies. Weighted IV estimates, where treatment is instrumented with the participation to a MGI before 2008; weights are computed using propensity scores estimates, see table 4 col. (2). See section 3 for details. **Panel (A)**. Dependent variable: log of sales. **Panel (B)**. Dependent variable: Return on Equity. For the definition of each variable see Appendix B.

Table 12: Effects on bank-firm relationships

| | (A) Dependent variable: Number of Banks | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.4593*** | 0.1145 | -0.0875 | -0.2700 |
| | [0.1454] | [0.2504] | [0.3257] | [0.3599] |
| | (B) Dependent variable: Herf. bank loans | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | -0.0273* | -0.0081 | 0.0268 | -0.0119 |
| | [0.0149] | [0.0214] | [0.0256] | [0.0248] |
| | (C) Dependent variable: Sh. main bank | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | -0.0169 | 0.0084 | 0.0346 | 0.0043 |
| | [0.0138] | [0.0200] | [0.0231] | [0.0234] |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta T_{it} + \delta_t + \varepsilon_{it}$, see section 3. $T_{it}$ is a dummy equal to one for treated firms after 2008 and zero otherwise. All regressions include time dummies. Weighted IV estimates, where treatment is instrumented with the participation to a MGI before 2008; weights are computed using propensity scores estimates, see table 4 col. (2). See section 3 for details. **Panel (A)**. Dependent variable: Number of banks the firm is borrowing from. **Panel (B)**. Dependent variable: Herfindhal index of bank loans. **Panel (C)**. Dependent variable: Share of loans from the main bank. For the definition of each variable see Appendix B.

Table 13: Effects on firms' riskiness

| | (A) Dependent variable: Bad Loans | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0119 | 0.0602*** | 0.1266*** | 0.1749*** |
| | [0.0148] | [0.0233] | [0.0301] | [0.0334] |
| | (B) Dependent variable: Non-performing Loans | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0578* | 0.0408 | 0.1015** | 0.1210*** |
| | [0.0316] | [0.0361] | [0.0405] | [0.0415] |

*Notes*: Authors' calculations on Credit register/Province of Trento dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta T_{it} + \delta_t + \varepsilon_{it}$, see section 3. $T_{it}$ is a dummy equal to one for treated firms after 2008 and zero otherwise. All regressions include time dummies. Weighted IV estimates, where treatment is instrumented with the participation to a MGI before 2008; weights are computed using propensity scores estimates, see table 4 col. (2). See section 3 for details. **Panel (A)**. Dependent variable: Dummy equal to one if the firm reported a bad loan. **Panel (B)**. Dependent variable: Dummy equal to one if the firm reported a non-performing loan.

Table A.1: Balancing properties before and after reweighting

| | Before reweighting | | | After reweighting | | |
|---|---|---|---|---|---|---|
| | Non-AA | AA | Mean Differences | Non-AA | AA | Mean Differences |
| $ln(Sales)$ | 6.639 | 8.102 | 1.463*** | 8.144 | 8.102 | -0.041 |
| | [1.885] | [1.568] | (0.122) | [1.776] | [1.568] | (0.130) |
| $ln(Assets)$ | 6.748 | 8.139 | 1.391*** | 8.180 | 8.139 | -0.041 |
| | [1.706] | [1.483] | (0.115) | [1.596] | [1.483] | (0.122) |
| ROE | 0.115 | 0.108 | -0.007 | 0.093 | 0.108 | 0.014 |
| | [2.060] | [0.757] | (0.069) | [2.208] | [0.757] | (0.082) |
| Debt/Assets | 0.295 | 0.423 | 0.128*** | 0.412 | 0.423 | 0.011 |
| | [0.376] | [0.272] | (0.021) | [0.304] | [0.272] | (0.022) |
| Sh. long term debt | 0.271 | 0.459 | 0.188*** | 0.453 | 0.459 | 0.006 |
| | [0.343] | [0.307] | (0.023) | [0.334] | [0.307] | (0.025) |
| Growth Sh. long term debt | 0.000 | 0.002 | 0.002 | 0.002 | 0.002 | -0.000 |
| | [0.179] | [0.152] | (0.012) | [0.160] | [0.152] | (0.012) |
| No. Banks | 1.421 | 3.758 | 2.337*** | 3.442 | 3.758 | 0.318 |
| | [1.856] | [3.325] | (0.025) | [2.956] | [3.325] | (0.280) |
| Herf. bank loans | 0.459 | 0.459 | 0.000 | 0.452 | 0.459 | 0.008 |
| | [0.389] | [0.315] | (0.024) | [0.292] | [0.315] | (0.025) |
| Sh. main bank | 0.519 | 0.610 | 0.090*** | 0.606 | 0.610 | 0.003 |
| | [0.393] | [0.261] | (0.021) | [0.252] | [0.261] | (0.020) |
| No. Obs. | 2515 | 180 | | 2515 | 180 | |

*Notes*: Authors' calculations on Credit register. Standard deviations in squared brackets, robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. AA firms are those that joined a MGI before 2008. For the definition of each variable see Appendix B. Non-AA units are weighted by $\frac{\rho(x)}{1-\rho(x)}$, where $\rho(x)$ is the propensity score. See section 3 for details.

Table A.2: Effects on firm performance: input

| | (A) Dependent variable: $log(Assets)$ | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0212 | 0.0997* | 0.0399 | -0.0479 |
| | [0.0328] | [0.0596] | [0.0674] | [0.0862] |
| | (B) Dependent variable: $log(Tangible\ Assets)$ | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0202 | 0.0792 | 0.0569 | 0.0125 |
| | [0.0341] | [0.0628] | [0.0775] | [0.0962] |
| | (C) Dependent variable: $log(Intangible\ Assets)$ | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0076 | 0.0100 | 0.0718 | 0.0115 |
| | [0.0910] | [0.1246] | [0.1556] | [0.1794] |
| | (D) Dependent variable: $log(Labor\ Cost)$ | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | -0.0132 | -0.0320 | -0.0049 | -0.0213 |
| | [0.0372] | [0.0364] | [0.0366] | [0.0568] |

*Notes*: Authors' calculations on Credit register dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta AA_{it} + \delta_t + \varepsilon_{it}$, see Appendix C. $AA_{it}$ is a dummy equal to one for already affiliated (to a MGI) firms after 2008 and zero otherwise. All regressions include time dummies. Weighted OLS estimates; weights are computed using propensity scores estimates, see table A.1. See section 3 for details. **Panel (A)**. Dependent variable: log of total assets. **Panel (B)**. Dependent variable: log of tangible assets. **Panel (C)**. Dependent variable: log of intangible assets. **Panel (D)**. Dependent variable: log labor cost. For the definition of each variable see Appendix B.

Table A.3: Effects on firm performance: output

| | (A) Dependent variable: $log(Sales)$ | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0694 | -0.0078 | 0.0005 | -0.0095 |
| | [0.0612] | [0.0521] | [0.0582] | [0.0690] |
| | (B) Dependent variable: ROE | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.3320 | 0.6985 | 0.4173 | 0.3257 |
| | [0.3665] | [0.4324] | [0.3670] | [0.3825] |

*Notes*: Authors' calculations on Credit register dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta AA_{it} + \delta_t + \varepsilon_{it}$, see Appendix C. $AA_{it}$ is a dummy equal to one for already affiliated (to a MGI) firms after 2008 and zero otherwise. All regressions include time dummies. Weighted OLS estimates; weights are computed using propensity scores estimates, see table A.1. See section 3 for details. **Panel (A)**. Dependent variable: log of sales. **Panel (B)**. Dependent variable: Return on Equity. For the definition of each variable see Appendix B.

Table A.4: Effects on bank-firm relationships

| | (A) Dependent variable: Number of Banks | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.1841 | 0.3293* | 0.4964** | 0.3517 |
| | [0.1503] | [0.1691] | [0.1927] | [0.2252] |
| | (B) Dependent variable: Herf. bank loans | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | -0.0033 | 0.0048 | 0.0038 | 0.0379 |
| | [0.0255] | [0.0250] | [0.0302] | [0.0322] |
| | (C) Dependent variable: Sh. main bank | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0030 | 0.0111 | 0.0168 | 0.0481 |
| | [0.0260] | [0.0247] | [0.0297] | [0.0325] |

*Notes*: Authors' calculations on Credit register dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta AA_{it} + \delta_t + \varepsilon_{it}$, see Appendix C. $AA_{it}$ is a dummy equal to one for already affiliated (to a MGI) firms after 2008 and zero otherwise. All regressions include time dummies. Weighted OLS estimates; weights are computed using propensity scores estimates, see table A.1. See section 3 for details. **Panel (A)**. Dependent variable: Number of banks the firm is borrowing from. **Panel (B)**. Dependent variable: Herfindhal index of bank loans. **Panel (C)**. Dependent variable: Share of loans from the main bank. For the definition of each variable see Appendix B.

Table A.5: Effects on firms' riskiness

| | (A) Dependent variable: Bad Loans | | | |
|---|---|---|---|---|
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | -0.0070** | 0.0096 | 0.0202 | -0.0268 |
| | [0.0032] | [0.0137] | [0.0248] | [0.0174] |
| | (B) Dependent variable: Non-performing Loans | | | |
| | 2008-09 | 2008-10 | 2008-11 | 2008-12 |
| $\beta$ | 0.0060 | 0.0139 | 0.0059 | -0.0303 |
| | [0.0222] | [0.0350] | [0.0432] | [0.0450] |

*Notes*: Authors' calculations on Credit register dataset. Clustered standard errors in parentheses at firm level. *** p<0.01, ** p<0.05, * p<0.1. Estimating equation: $y_{it} = \alpha_i + \beta AA_{it} + \delta_t + \varepsilon_{it}$, see Appendix C. $AA_{it}$ is a dummy equal to one for already affiliated (to a MGI) firms after 2008 and zero otherwise. All regressions include time dummies. Weighted OLS estimates; weights are computed using propensity scores estimates, see table A.1. See section 3 for details. **Panel (A)**. Dependent variable: Dummy equal to one if the firm reported a bad loan. **Panel (B)**. Dependent variable: Dummy equal to one if the firm reported a non-performing loan.

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