Bank market power and corporate performance

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Abstract

We examine the interrelationship between bank market power and firm performance, using bank-firm relationships for syndicated loan deals. We show that the relatively poor-performing firms in the year prior to loan origination, obtain credit from banks with relatively high market power. However, bank market power positively affects the performance of firms in the year after the loan origination, albeit this effect turns negative for very high levels of market power. Thus, our results validate the hypothesis that bank market power, up to a certain extent, is beneficial as a means to enhance the availability of credit to worse-performing firms and, in general, to improve the future performance of the borrowing firms.

JEL classification: G21; G32; L13
Keywords: Bank market power; Lerner index; Firm performance; Syndicated loans

1. Introduction

What is the effect of bank market power on the performance of the borrowing firms? Answering this question has profound welfare implications for the efficient functioning of the loan market and the intermediation role of banks in the economy. The proponents of competitive markets suggest that any market power introduces a deadweight loss in the economy, which in the loan market translates to higher intermediation margins and lower productive efficiency of the borrowing firms. For the banking sector this view is, however, strongly challenged. A potent theoretical and empirical literature poses that immense competition between banks, and the associated trimmed profits of the sector, are a recipe for bank failures and financial instability (Keeley, 1990). Further, and more importantly for our purposes, a degree of bank market power may be warranted to establish a strong, efficient, and relatively riskless bank-firm relationship and promote healthier and more profitable product markets.

In this paper, we analyze the nexus between market power and firm performance both before and after the loan origination. We heavily rely on parts of the theoretical contributions by Petersen and Rajan (1995), Boot and Thakor (2000), and. The former two studies suggest that banks with market power have incentives to lend to relatively low-performance firms, but with good investment ideas, so as to extract the highest rents possible. Assuming that banks with market power have a superior screening capacity of good investment ideas, this allows them to fund these projects more easily relative to competition and maintain a high degree of market power in the future period. In turn, Allen, Carletti and Marquez (2011) show that low-performance firms would prefer (or be forced) to borrow from healthier banks (potentially with high market power) to reduce risk and obtain the required credit. After the loan origination, this practice will improve the performance of the borrowing firms, given the ability of the firm

to fund the investment opportunity, as well as the informational and monitoring advantages of banks with market power that safeguard the borrowing firm against a loan default.

In view of these seminal theoretical considerations, we formulate two testable hypotheses. The first posits that banks with high market power will tend to be associated with low performance firms, with firm performance being observed by banks before the origination of the loan. To test this hypothesis we formulate an empirical model where the performance of firms in the previous period is related with the market power of banks in the current period. The second, and most important hypothesis for the real economic outcomes, posits that the *casual* effect of bank market power on the performance of borrowing firms should then be positive, mainly because of the mere action to provide credit to good investment ideas and the superior screening and monitoring ability of banks with market power. Thus, we test this hypothesis by analyzing the effect of the bank market power in the current period on the next period's firm performance.

We test the two hypotheses using data from the US syndicated loan market over the period 2000-2010 to match banks with the borrowing firms. This market includes large corporate loans granted by a group of banks to a single firm. Subsequently, we obtain information for bank and firm characteristics from a number of relevant databases. This procedure yields a unique multilevel sample with multiple loans made by each lead bank of the syndicate to each borrowing firm. We formally estimate the market power of banks at the bank-year level using the Lerner index and we measure firm performance with several variables, including the return on assets (ROA) and Tobin's q.

Estimating a bank market power equation (under the first hypothesis) or a firm performance equation (under the second hypothesis) entails a difficult identification problem due to omitted variables. In this respect, the multilevel structure of our sample is quite important because it allows using both bank and firm (high-dimensional) fixed effects in

estimating our empirical models. Our estimation methodology yields very high values for the R-squared, which is reassuring against the presence of significant omitted variables. We also experiment with a re-specification of our model, whereby we consider only syndicate loans with the same syndicate members. This allows for a powerful test of the effect of the Lerner index on ROA (second hypothesis) because, given the high-dimensional fixed effects, only the time variation in the Lerner index (and not the within syndicate variation) will play a role in determining future ROA.

We provide empirical evidence that the low-performance firms in the year before the loan origination are matched with banks with high market power at the year of the loan origination. Specifically, we show that a firm with a one standard deviation higher ROA, compared to the firm with an average ROA in our sample, will be matched with a bank with a 44% lower Lerner index. Thus, our first hypothesis is validated.

Turing to the second hypothesis, we show that there is a causal positive effect of bank market power in the current period on the firm profitability in the next year. This effect is economically quite potent. Also, an increase in the Lerner index by a one standard deviation increases the firms' ROA by 0.012 points, which is quite substantial if one considers that the average ROA in our sample is equal to 0.015. The same finding prevails when we use the Tobin's q as a measure of firm performance. Thus our main findings are in line with the theories arguing in favor of the banks possessing some market power as a means to enhance the future performance of the borrowing firms (Boot and Thakor, 2000).

However, we also find that for a limited number of very large values of the Lerner index (near monopolistic behavior of banks), the effect of market power on firm performance turns negative. This implies that too much market power is eventually harmful for the borrowing firms. In fact, this a finding is in line with the theoretical framework of Boyd and De Nicolo (2005), who show that as banks charge higher loan rates due to lower competition the borrowers

optimally increase their own risk of failure. Thus, our empirical results explain two competing theories on the real outcomes of bank-firm relationships, based on the degree of competition in the banking sector.

The rest of our paper is structured as follows. Section 2 sets the context of our study and formulates the two testable hypotheses. Section 3 describes the empirical model and the data used in the empirical analysis. Section 4 discusses the empirical identification procedure and the estimation results. Section 5 summarizes the results and provides policy implications.

2. Setting the context and hypotheses

The traditional approach to bank competition (inverse of market power) has been that, as in any other market, it boosts the efficiency and the quality of production of banking products and the welfare of borrowers. These can be achieved through the decline in interest rate margins, increased access to finance and better investment opportunities for firms and households (Besanko and Thakor, 1992; Petersen and Rajan, 1995). However, the welfare implications of competition in the banking industry are not as straightforward as in other industries. Keeley (1990) was perhaps the first to point out that higher competition in banking (in terms of low price-cost margins) leads to a more risky banking sector through the increased incentives of competitive, and thus less profitable, banks to take on higher risks (*margin effect*). The empirical tests of this literature (e.g., Jimenez, Lopez, and Saurina, 2013) focus on the relation between bank market power and risk, almost entirely disregarding the role and the outcomes for the borrowing firms.[1] However, the theoretical literature is not mostly about banks; more importantly it considers the bank-firm relationships and their effect on the real economy.

[1] An exception is Cetorelli (2004), who explores whether bank concentration affects the structure of nonfinancial industries, using a panel of manufacturing industries in 29 OECD countries. The evidence suggests that lower concentration in the banking industry leads to a lower average firm size.

The bank-firm relationship has two elements attached to it, one concerning the matching process between banks and firms prior to the loan origination and one the performance of the borrowing firms after the loan origination. Considering the former, Petersen and Rajan (1995) and Boot and Thakor (2000) theoretically show that banks with high market power tend to lend to borrowers with low *a priori* performance but with profitable investment opportunities. This is merely because banks would optimally prefer to capture most of the incremental benefit of a relationship loan, while banks with market power are likely to possess a superior ability to screen the profitable investment ideas. In other words, banks with high market power will have a greater flexibility, in terms of profitability, capitalization, and screening capacity, to deal with relatively worse-performing firms.

Allen, Carletti, and Marquez (2011) somewhat turn the question around and focus on firms. They suggest that firms would also prefer to borrow from banks with healthy balance sheets (well-capitalized banks in their model). If we could safely assume that the well-capitalized banks possess higher market power, then it is also likely that firms perceive the market power of banks as an element of financial health, and superior ability to monitor loans once these have been originated. Also, as Dennis and Mullineaux (2000) suggest, firms perceived as highly risky are rejected by capital markets and are forced to accept the tighter terms of private lenders. To the extent that these tighter terms also include borrowing from banks with higher price-cost margins, these firms would be matched with high market-power banks. In a nutshell, these influential theoretical papers allow formulating an empirically testable hypothesis as follows:

H1: Low profitability firms will be matched with banks with high market power.

An analysis of the matching process for banks and firms has its own merits, but perhaps the most important issue for the real economic outcomes concerns the future performance of firms (after the loan origination) that borrow from banks with high market power. Boyd and

De Nicolo (2005) reconsider the competition-fragility nexus of Keeley (1990) by re-inventing the role of firms in this nexus. They show that as competition declines, banks charge higher loan rates, which imply higher bankruptcy risk for borrowers. Then, within a moral hazard framework, the borrowing firms optimally increase their own risk of failure (*risk-shifting effect*). This framework, however, does not consider the superior monitoring capacity of banks with higher market power, as a means to safeguard banks from this particular type of moral hazard and firms from deteriorating future performance.

The models by Boot and Thakor (2000) and Allen, Carletti, and Marquez (2011) precisely suggest that lenders can improve the future borrower's performance (project payoff) through intense monitoring of the loan facility after its origination and this can generate higher borrower surplus to be shared by the borrower and the lender. In fact, monitoring can enhance the borrower's performance in at least five ways. First, the mere funding of an investment idea with a positive expected payoff will generate increased profitability for the borrowing firm. Second, a bank could provide additional financing to a liquidity-constrained firm even after the initial loan origination. This financing may come *via* an extra loan facility (commitment), with an accompanying enhancement in the borrower's payoff. Third, the bank can increase the debt payoff restructuring of a financially distressed borrower by performance pricing. Fourth, a bank may hold other loans in the industry and know more about this industry compared to its borrowers, thus being able to provide valuable advice. Fifth, assuming that banks with market power have a superior monitoring capacity, the nexus between the market power of banks at the time of loan origination and the future performance of firms should be positive. Degryse and Ongena (2005) use the distance between borrowers and lenders to characterize the bank competition--monitoring effort relation and indeed suggest that the two are negatively related.

A number of other empirical papers analyze the bank-firm relationship and indirectly offer additional potential explanations for a link between bank market power and future firm

performance. De Haas and Van Horen (2013) use the syndicated loan market and suggest that lending experience also gives banks a relative market power over their borrowers (less incentive to switch to another bank and banks can exploit this by charging higher interest rates). This is because through repeat lending (lending experience from the same banks that participate in the syndication or borrowing to the same firm), banks reduce information asymmetries and build up proprietary information about borrowers. Dass and Massa (2011) show that a stronger bank-firm relationship improves the borrower's corporate governance and its value. For instance, a bank may be interested in preserving the market value of the firm to avoid an increase in the firm's market leverage, or just to preserve the market valuation of the collaterals posted by the borrower.

The theoretical considerations discussed above, especially those of Boot and Thakor (2000) and Allen, Carletti, and Marquez (2011) vs. those of Boyd and De Nicolo (2005), could also point to a non-linear relation between bank market power and firm performance. This type of relation would be similar to the proposition by Martinez-Miera and Repullo (2010) about the U-shaped relation between bank competition and the bank fragility. Specifically, their proposition suggests that the risk-shifting effect identified by Boyd and De Nicolo (2005) dominates in monopolistic markets, whereas the margin effect identified by Keeley (1990) dominates in competitive markets. Even though the model of Martinez-Miera and Repullo concerns bank risk as the outcome variable (and not firm risk or performance), we could theoretically conceive a similar outcome for the bank-firm relationship: too much bank market power could eventually trigger a situation where firms optimally decide to default on their loan due to the oppressing level of market power attached to this loan.

Whether the effect of bank market power on firm performance post loan origination is positive, negative or bell-shaped, becomes an empirical question. However, we should note that most of the directly relevant theoretical literature and the indirectly relevant empirical

literature point to a positive effect of bank market power on future firm performance. Thus, we formulate our second testable hypothesis as follows:

H2: Bank market power has a positive effect on the performance of the borrowing firms after the origination of the loan.

The two testable hypotheses are interrelated in a dynamic way. Specifically, the relatively poor-performing firms before the origination of the loan (reference to H1) might improve their performance (reference to H2) if they borrow from banks with market power. Thus, an empirical analysis that validates both H1 and H2 will suggest a beneficial effect of market power in banking that has not been exploited in the related empirical literature.

It is important at this stage to note two issues. First, the discussion here refers to relatively developed banking and financial systems. If markets are not deep enough and institutions are weak, then the forces highlighted above might not be at work and market power can be hurtful for firm performance (see also Delis, 2012). Second, there is a stark difference between the two hypotheses in terms of causality. H1 does not infer a causal relation; it just infers that firms with relatively low profitability will be matched with banks with relatively high market power. In contrast, H2 suggests a *de facto* positive link running from bank market power to firm performance in the period post the loan origination.

3. Empirical model and data

Based on our two hypotheses, we estimate two respective empirical models. First, we examine whether banks with high market power are matched with relatively low-performing firms. This translates to an empirical model of the form:

$$LI_{b,t} = \varphi R_{f,t-1} + \delta_1 F_{f,t-1} + \delta_2 L_{lt} + \delta_3 B_{b,t-1} + \varepsilon_{fbt}. \quad (1)$$

In equation (1) the market power *LI* of bank *b* at the loan origination time *t*, is regressed on the performance *R* of firm *f* at *t-1*, a vector of firm characteristics *F* at *t-1*, a vector of loan

characteristics L at t, and a vector of banks' characteristics B at t-1. The term ε is the stochastic disturbance, which for identification purposes includes both bank and firm fixed effects as we will further discuss below.

The timing of the variables is in line with the idea that the firms with certain characteristics at time t-1 will seek to obtain a loan at time t from a bank (or a number of banks) with a level of market power LI at that time t. Our testable hypothesis H1 implies that φ should be negative and statistically significant, indicating that firms with relatively low performance are associated with banks' with high market power.

In turn, H2 refers to the effect of banks' market power on the performance of firms after the loan agreement. The relevant empirical model is:

$$R_{f,t+1} = \gamma\, LI_{b,t} + \theta_1\, F_{f,t-1} + \theta_2\, L_{lt} + \theta_3\, B_{b,t-1} + u_{fbt}\,, \qquad (2)$$

where u is the stochastic disturbance, and the rest of the variables are as above. H2 implies that γ is positive and statistically significant and the timing of the model assumes that the market power of bank at time t has an effect on the performance of banks in the next period.

3.1. Data and the syndicated loan market

We construct a unique database including information on syndicated loans, the involved banks, and the borrowing firms. We focus on US syndicated loan deals for the period 2000-2010. We draw data from four different data sources and match them to construct our final sample. Our data sources are the Thomson Reuters LPC's DealScan database, the Call reports from the Federal Reserve Board of Governors (FRB), Compustat, and the New Generation Research Bankruptcy (NGRB) database.

We begin with only a brief description of the syndicated loan market, as this market has been extensively analyzed before by a number of studies (e.g., Sufi, 2007). The syndicated loans are credits granted by a group of banks to a single borrower. Loan syndication allows

banks to compete with the capital markets in the generation of relatively large transactions that a sole lender wouldn't otherwise be able (or willing) to undertake due to internal and regulatory restrictions. These loans represent a hybrid instrument, combining features of relationship lending and transaction lending. They allow the sharing of credit risk between various financial institutions without the disclosure and marketing burden that bond issuers face.

In general, the syndication process works as follows. The borrowing firm signs a loan agreement with the lead arranger, who specifies the loan characteristics (collateral, loan amount, covenant, a range for the interest rate, etc). The members of the syndicate fall into three groups, namely the lead arranger or co-leads, the co-agents, and the participant lenders. The first group consists of senior syndicate members and is led by one or more lenders, typically acting as mandated arrangers, arrangers, lead managers or agents. If two or more lead arrangers are identified, they are then co-leads. Lead arrangers coordinate the documentation process, choose whom to invite to participate in the loan syndicate and may delegate certain tasks to the co-agents. In addition, the lead arranger receives a fee (paid by the borrower) for arranging and managing the syndicated loan.

The co-agents are not in a lead position but they collaborate with the lead arranger in administrative responsibilities, as well as in the screening and monitoring efforts. The lenders with neither lead nor co-agent roles are classified as participant lenders. These lenders can provide comments and suggestions when the syndication occurs prior to closing. However, they are not generally involved in the negotiations or the information sharing between the borrower and the lead arrangers (or the co-agents if applicable). The price and the structure of the loans are determined in a bargaining process that takes place between the lead bank and the potential participants after the non-price characteristics of the loan are set.

A key aspect differentiating a syndicated loan from multiple sole-lender loans is that the members of the syndication reduce their costs by avoiding staff, monitoring, and origination

costs. However, this benefit comes at a cost. The loan syndication market could display some unique types of agency problems, stemming both from adverse selection and moral hazard. The moral hazard problem emerges when lenders decide to sell in the secondary market parts of the loan to a "passive" lender whose incentives to monitor are reduced. The adverse selection problem arises when the participant lenders do not have private information about the borrower's quality.

The information for the syndicated loan deals is from DealScan. This database provides detailed information on the loan deal's characteristics (amount, maturity, collateral, borrowing spread, performance pricing, etc.), as well as more limited information for the members of the syndicate, the lead bank, the share of each bank in the syndicated (which is important in the construction of our measure of market power discussed below) and the firm that receives the loan.

To obtain information for the financial statements of the banks we match these data with the Call Reports. Because the Call reports data are available on a quarterly basis, we match the information on the origination date of the loan deal with the relevant time dimension (quarters). For example, we match all syndicated loans that were originated from April 1$^{st.}$ to June 30$^{st.}$ with the second quarter of that year of the Call Reports data. In a similar fashion, we obtain information for the financial statements of firms from Compustat, the information being available annually. Further, the New Generation Research Bankruptcy database provides information for the timing of borrower defaults. Subsequently, we assume that an active loan defaults if the borrowing firm also defaults.

Our analysis is conducted at the "loan-facility" level, as opposed to the "loan-deal" level. The difference between the two is that the loan facility refers to each portion of the loan as these are granted to firms, whereas the deal is the full amount of the loan. Thus, a syndicated loan deal may contain more than one loan facility. A loan-facility analysis is appropriate, as

opposed to loan-deal analysis, for two reasons. First, loan facilities have differences in their starting date, maturity, amount, and loan type. Hence, multiple loan facilities on the same loan deal cannot be treated as dependent observations, because such an analysis may potentially introduce some bias in our result. Second, according to Maskara (2010), the loan facility can be used as a diversification device, in which riskier firms are more likely to take loans with multiple facilities (tranching). However, all results presented below are robust to a loan-deal analysis. In our sample, 80% of the loan deals contain only one facility, and the remainder two or more facilities.

The matching process yields a maximum of 25,236 loan facilities (17,952 loan deals) originated from 296 banks involving 9,029 non-financial firms. However, the number of observations used for the regressions is a bit lower depending on the availability of data for the different variables used. This sample is a so-called multilevel data set, which has observations on banks and firms (lower level) and loan deals (higher level). This is a unique feature that proves particularly helpful for econometric identification purposes. Table 1 formally defines all variables used in the empirical analysis and Table 2 offers summary statistics. We briefly discuss these variables in turn.

[Insert Tables 1 & 2 about here]

3.1. Measures of bank market power

The measurement of market power of banks has received much attention in the literature. The Lerner index (1934) remains to this day a popular measure of market power, measuring departures from the competitive benchmark of marginal cost pricing. It is defined as:

$$LI_{bt} = \frac{P_{bt} - MC_{bt}}{P_{bt}} \qquad (3)$$

where *P* and *MC* are the price of bank output at time *t* and the marginal cost of the production of this output. The index ranges between zero and one, with zero corresponding to perfect

competition and larger values reflecting more market power (and less competition). The index can also be negative if $P < MC$, which is of course not sustainable in the long run (at least for a market-based financial institution).

The Lerner index has a number of merits that make it an appealing measure of market power. First, the Lerner index is perhaps the only structural indicator of market power that can be estimated at the bank-year level. This is quite important for the purposes of our study, as we examine bank-firm relationships. Second, as Beck, De Jonghe, and Schepens (2013) argue, the Lerner index is a good proxy for current and future profits stemming from pricing power, while it is not constrained by the extent of the market. Moreover, the Lerner index captures both the impact of pricing power on the asset side of the banks' balance sheet and the elements associated with the cost efficiency on their liability side.

Alternative measures of market power include the H-statistic (Panzar and Rosse, 1987) and the profit elasticity (Griffith, Boone, and Harrison, 2005). The H-statistic has been widely used in banking studies, but has two main shortcomings. First, as Bikker, Shaffer, and Spierdijk (2012) point out, the H-statistic maps the various degrees of market power only weakly and thus cannot be viewed as a continuous variable. Second, it is quite difficult to measure and interpret the H-Statistic as a bank-year measure of market power. In turn, the profit elasticity (or Boone indicator) is a relatively new concept that has been used in some recent studies but has also received criticism, especially concerning the empirical implementation. For example, Schiersch and Schmidt-Ehmcke (2010) show that the empirical equivalent of the Boone indicator makes critical assumptions relative to firm size and to the definition of the market. Further, it is also difficult to estimate the Boone indicator at the bank-year level.

Computation of the Lerner index requires knowledge of the marginal cost. When such information is unavailable (as in most empirical data sets), the marginal cost can be estimated using econometric methods. A popular approach has been to estimate a translog cost function

and take its derivative to obtain the marginal cost. Some recent work has shown that it is possible to improve on this methodology with semiparametric or nonparametric methods that allow for more flexibility in the functional form (Delis, Iosifidi, and Tsionas, 2013; Delis, Kokas, and Ongena, 2014). As we follow the exact same approach with Delis, Kokas, and Ongena (2014), we do not repeat the details here. We also examine the sensitivity of our results using parametric methods and the translog cost function to estimate marginal cost (e.g., Beck, Jonghe, and Schepens, 2013).

Notably, the Lerner index is an absolute measure of market power and needs to be weighted with the share of each bank in the syndicated loan. Our database contains full information on loan shares for about 24% of all loans and for these loans we allocate the exact loan portions to the individual lenders. For the other 76% we primarily employ the approach of De Haas and Van Horen (2012); that is we divide the loan equally among the syndicate members. Section 4.2 presents robustness tests that show that our results also hold when we allocate the shares for the 75% of the sample in other ways.

3.2. Measures of firm performance

Our main measure for firm performance is the return on assets (ROA), which is used by the majority of the corporate finance literature (e.g., Adams and Ferreira, 2009). In our baseline specifications we calculate ROA as the net firm income over total assets. We also use a variant of this traditional definition for ROA, namely the ratio of income before extraordinary items over total assets, named ROI (Massa and Dass, 2009).

Another commonly-used measure of firm performance that we also employ in our analysis is Tobin's q (Adams and Ferreira, 2009; Massa and Dass, 2009). Tobin's q is a future-oriented and risk-adjusted measure of performance, reflecting the premium that the capital market will pay for a given level of firm assets. Finally, we also use a measure of firm leverage,

constructed by the ratio of long-term debt to total assets. The higher this ratio, the higher the degree of leverage and consequently the lower the firms' performance.

3.3. Control variables

We experiment with a very large number of control variables and we resort to the ones for which we provide formal definitions in Table 1 and summary statistics in Table 2. The loan-level variables include the size of the loan (*deal amount*), the time to maturity (*maturity*) and a series of dummy variables describing a number of loan characteristics. Specifically, we include a dummy variable equal to one when the loan is downgraded and zero otherwise (*downgrading*), a dummy variable equal to one when a borrower defaulted during the life of the loan (*default*), the number of financial covenants (*financial covenants*), a dummy variable equal to one if the loan has collateral (*collateral*), and a dummy variable equal to one if a performance pricing option is included in the loan contract (*performance pricing)*.

Concerning the bank-level variables, we use the ratio of non-performing loans to total loans (*non-performing loans*) as a measure of ex post bank credit risk, the ratio of interest expenses to total assets (*interest expenses*), the ratio of tier 1 capital to total loans (*tier 1*), bank size using the natural logarithm of real total assets, and the ratio of customer deposits to total assets (*deposits*).

Finally, at the firm level, we control for *firm size*, measured by the natural logarithm of total assets, the number of syndicated loans that a firm has received during a year (*number of loans*), a dummy variable equal to one if the firm has a previous lending relationship with the lead arranger in the last five years (*client*), and *firm efficiency* measured by sales to total assets.

4. Empirical identification and estimation results

4.1. Empirical identification

In our empirical analysis, and following the usual practice in studies of the syndicated loan market (e.g., Cai, Saudners and Steffen, 2012), we use the available observations for all the participants in each syndicated loan and not only the lead arranger(s). In a loan syndication, all members share loan documents (loan agreement, collateral, covenant, etc.) and provide comments, suggestions, and any available information to enhance the monitoring ability of the lead bank(s). Each member is a direct lender to the borrower, with every bank's claim evidenced by a separate note. Also, the lead arrangers choose to collaborate with those banks that have a similar focus in terms of lending expertise. Moreover, the lead arrangers assign more responsibilities to banks that they are already "connected" with, and delegate some monitoring duties accordingly (Cai, Saunders, and Steffen, 2012).

In equation (1) we are only concerned with the matching of firms and banks and not with the identification of a causal relation running from firm performance to bank market power. Thus, we are interested only in reducing the omitted-variable bias, as this might affect the economic significance of φ. The structure of our sample, including multiple loans made by each bank for each firm, allows including both bank and firm fixed effects (high-dimensional fixed effects). This identification strategy essentially accounts for other unobserved bank and, most importantly, firm-specific characteristics that could inflict a correlation between φ and ε. In alternative specifications we also include loan purpose fixed effects. The particular methodology used is thoroughly described in Gormley and Matsa (2014). Jimenez, Ongena, Peydro, and Saurina (2012; 2014) use a similar identification method to avoid the omitted-variable bias.

In contrast, in equation (2) we are interested in identifying a causal relation running from bank market power to firm performance. In this sense, endogeneity can arise both from reverse causality and omitted-variable bias. We account for reverse causality by lagging all the right-hand side variables except from loan characteristics. This is intuitive both statistically and

theoretically. From a statistical viewpoint, the literature (e.g., Beck, Jonghe, and Schepens, 2013) suggests that explanatory variables in lags can potentially diminish endogeneity issues that emerge due to reverse causality. On the theoretical side, it will probably take some time after the origination of the loan for the bank market power to have an effect on the performance of the borrowing firms.

We essentially eliminate the omitted-variable bias using the same strategy with that used for the estimation of equation (1), i.e. we use high-dimensional fixed effects for firms and banks. Consequently, our identification strategy yields a very large R-squared value. We should perhaps note that the time dimension is not an issue, because the loan deals are unique (not repeated in time). Our sample of loan facilities is essentially a cross-section of loans across banks and firms and we include data for variables according to the timing noted in equations (1) and (2). That is, we do *not* use a true panel data set for firms and banks, in the sense that loan facilities are not repeated. Thus, the effect of the general conditions affecting bank market power and firm performance is already captured by the loan-level controls and the bank- and firm-related fixed effects.[2]

4.2. The matching of low-performance firms with high-market power banks

Table 3 reports the baseline regression results from the estimation of equation (1). The different specifications (I-V) report the results from the inclusion of different types of fixed effects and different types of clustering. The R-squared value is very high, ranging from 86% in specification I that only includes bank fixed effects, to 95.5% in the rest of the specifications that additionally include firm fixed effects. Thus, the inclusion of bank and firm fixed effects

[2] Including firm*year and bank*year fixed effects if still feasible, as some firms obtain more than one loan facilities within a given year and banks give out more than one loans within a given year. However, these effects almost completely identify equations (1) and (2), without adding much to the identification strategy, given that the loan-level controls and the bank and firm fixed effects already incorporate the information defining the bank-firm relationship.

almost eliminates the omitted variables bias. Adding purpose fixed effects in model III or clustering the standard errors by year or by loan in models IV and V (instead of clustering by bank) does not affect the R-squared or the estimation results. Thus, we treat model II as our baseline specification.

[Insert Table 3 about here]

The coefficient on ROA is negative and statistically significant at the 5% level, showing that the firms with relatively low ROA in the year before the loan origination will be matched with banks with high market power. To provide an example of the economic significance of our results for the bank-firm relationship, consider a firm with ROA equal to a one standard deviation lower than our sample's mean. Based on a linearity assumption for the relation between ROA and the Lerner index,[3] and according to specification II, a firm with a one standard deviation higher ROA (0.456) will be matched with a bank with a 0.004 points lower Lerner index (calculated from the product 0.009 x 0.456). The opposite will hold for a firm with a one standard deviation lower ROA. This findings seems to confirm H1 on the matching between the low profitability firms and banks with high market power.

In Table 4 we examine the sensitivity of our results to several re-specifications of model II of Table 3. In models I and II we use two alternative methods to weight the Lerner index, instead of using equal shares for the members of the syndicate for the 75% of our sample for which we lack the relevant data (see also De Haas and Van Horen, 2012). First, we use the 25% of our sample for which we have information on the loan shares to estimate a model in which the loan amount of individual lenders is the dependent variable and a number of characteristics of the loan are the explanatory variables.[4] We then use the estimated coefficients

[3] We examine possible non-linear effects by adding the squared term of *ROA* among the regressors, but we find no such effects.

[4] Specifically, as explanatory variables we use the average loan amount (loan amount divided by the number of lenders), a dummy that indicates whether a lender is an arranger or a participant, an interaction term between this arranger dummy and a variable that measures whether or not the borrower is a repeat borrower for the firm, an

to predict the loan portion for those lenders for whom we do not know the actual amounts (we replace negative predicted values with zero and predicted values exceeding the total loan amount with this amount). The results (column I) are qualitatively similar to those of Table 2. Second, we calculate the market share that each bank has in the US market per quarter and we use this market share to weight the Lerner index. Even though this is a more crude measure of the share in the loan syndicate, the results reported in column II are qualitatively similar.

[Insert Table 4 about here]

In column III we report the results from the translog specification (instead of the non-parametric specification). In line with the suggestion of Delis, Iosifidi, and Tsionas (2014), the standard error increases from this estimation rendering the coefficient on ROA statistically significant only at the 10%. However, inference is essentially unchanged given that the actual coefficient estimate remains quantitatively very similar to our benchmark specification. Our findings are also qualitatively similar when we carry out our analysis at the loan-deal level instead of the loan-facility level (column IV). In the last regression reported in Table 4 we assume that the firms choose only the lead arranger and, thus, this bank's market power. In this case the variance of the standard error increases relatively to the smaller sample, but the coefficient on ROA remains negative.

All in all, the sensitivity analysis confirms the main findings in Table 3, also confirming our first hypothesis: Relatively poor performing firms are matched with banks with relatively high market power. Essentially, provide the first empirical test of an important element of the theoretical contribution by Rajan (1995), Boot and Thakor (2000), and Allen, Carletti, and Marquez (2011) on the way the bank-firm relationships are formed, especially given the role of bank market power. In turn, these results show that the presence of banks with market power

interaction term between the arranger dummy and a post–Lehman Brothers time dummy, and a set of bank dummies.

can be important in providing credit to relatively poor-performing firms, even in relatively competitive markets like the syndicated loan market.

4.3. The effect of bank market power on firm performance after the loan origination

Turning to the examination of H2, we estimate equation (2) with ROA in the year *t*+1 as the dependent variable and report the results in Table 5. We estimate all models with the full set of control variables and with bank and firm (high-dimensional) fixed effects, and we verify that the findings are very similar if we exclude the firm and/ or the bank-level controls. In our baseline model (column I), the Lerner index is positive and significant at the 1% level. Also, an increase in the Lerner index by a one standard deviation (0.051 points) increases ROA by 0.012 points (calculated from the product 0.231 x 0.051), which is economically quite substantial if one considers that the average ROA in our sample is equal to 0.015.

[Insert Table 5 about here]

In specification II we examine whether the effect of the Lerner index is non-linear by adding its squared term. This is equivalent to our suggestion in Section 2 that bank market power is beneficial for future firm performance, but too much bank market power will eventually lead to lower performance. Even though the squared term is by itself statistically insignificant, the F-test for the joint significance of the Lerner index and its squared term (the p-value is reported in the bottom part of the table), shows that the relation is indeed an inverted U-shaped (bell-shaped). We can in fact calculate the point at which the effect of market power turns negative (turning point) by using the first derivative of the estimated equation with respect to the Lerner index. This yields a value equal to 0.73, which is within the range of the Lerner index, but corresponds to only 44 loan facilities (0.2% of the sample) for which bank market power lowers future firm returns. This small economic effect of the squared term is intuitive

given the relative competitiveness of the syndicated loan market.[5] Even though the impact of the squared term is economically small, we keep it in the subsequent specifications for reasons of completeness and we use specification II of Table 5 as our baseline.

In models IV and V of Table 5 we conduct an equivalent analysis with that of models I and II of Table 4, by weighting the Lerner index with the predicted shares and the bank market shares, respectively. The coefficient estimates on the Lerner index remain statistically significant at the 1% level, while the squared terms gain in statistical significance. The turning points in columns III and IV are also lower, but again correspond to a very small number of loan facilities in column III (79 in total) and a moderately small in column IV (498). In column V of Table 5 we estimate equation (2) using data at the loan-deal level as we did in Table 4, the results being very similar to the ones in our baseline specification.

The last specification in Table 5 is a quite interesting test for our identification purposes. In this equation, we draw data only for the loan facilities in which the syndicate members (banks and firms) are repeated. This allows for a powerful test of the effect of the Lerner index on ROA because, given the firm and bank fixed effects, only the time variation in the Lerner index (and in the weights used to construct the Lerner index) will play a role in determining future ROA. The results are equivalent to those of the baseline specification II, showing that our findings are robust to endogeneity arising from differences in the structure of the syndicate.

In the specifications of Table 6 we proceed by using three alternative measures of firm performance. First, we examine the effect of the Lerner index on Tobin's q, the most widely used measure of firm value. Much like the results for ROA, we find a statistically significant bell-shaped relation, with the turning point on the Lerner index at which the relation becomes negative being equal to 0.432. Once more, the number of loan facilities that take a value on the Lerner index above 0.432 is quite small (equal to 103) relative to the total number of

[5] We would expect that this effect would be quite larger in local loan markets with only few available lenders.

observations in the sample. In column II we use ROI as the dependent variable and the results are again very similar to those for ROA and Tobin's q. Finally, in column III we use Leverage, the results being suggestive of a U-shaped relationship. However, similar to ROA and ROI, the number of observations for which the bank market power increases firm leverage is quite small (154 loan facilities). From these tests we concur that our main results hold irrespective of the variable used to measure firm performance.

[Insert Table 6 about here]

In Table 7 we carry out a final set of robustness tests by changing the way the Lerner index is estimated. In column I we use the Lerner index obtained from a linear cost function (instead of the log-linear). This functional form may have the additional advantage that is the more general one, as it does not impose any structure on the technology, not even in the simplest log-linear form. In column II we return to the log-linear functional form, but we employ total assets as the bank output (instead of total earning assets). In column III we use a parametric estimation technique (OLS), instead of the non-parametric technique, and the usual translog cost function to estimate the Lerner index. The results from all these three exercises are equivalent to those reported in our baseline specification (model II of Table 5).

[Insert Table 7 about here]

In a nutshell, our findings in this section suggest that for the most part H2 is confirmed: bank market power has a positive effect on the performance of the borrowing firms after the origination of the loan for most of the loan facilities in our sample. From this viewpoint our findings confirm the theoretical considerations pointing to the positive real effects of bank market power (Boot and Thakor, 2000; Allen, Carletti, and Marquez, 2011). However, we also find limited evidence that for very high levels of market power and for few loan facilities the results reverse. The fact that we analyze the syndicated loan market, which by its very nature

is rather competitive, leads us to interpret this finding as evidence in favor of the theory by Boyd and De Nicolo (2005) on the risk-shifting effect.

5. Conclusions

(To be added)

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Table 1. Variable definitions and sources

Variable	Definition	Source
<u>Dependent variables</u>		
ROA	The ratio of net income to total assets.	Compustat
Tobins'q	The natural logarithm of the market-to-book ratio.	Id.
ROI	The ratio of income before extraordinary items to total assets.	Id.
Leverage	The ratio of long-term debt to total assets.	Id.
Lerner index	$LI_{bt} = \frac{P_{bt} - MC_{bt}}{P_{bt}} W_{bt}$, where *P* and *MC* are the price of bank output at time *t* and the marginal cost of the production of this output weighted by the shares of each bank *W* in the syndicated loan (equal shares are imposed where this information is not available). Marginal cost is estimated using a log-linear production function and total output is measured by total earning assets.	Own estimations based on data from the Call Reports
Lerner weighted by predicted shares	We estimate the shares *W* from a model in which the loan amount of individual lenders is the dependent variable and a number of characteristics of the syndicate are the explanatory variables. We then use the estimated coefficients to predict the loan portion for those lenders for whom we do not know the actual amounts.	Id.
Lerner weighted by bank market shares	We calculate the shares *W* as the market share that each bank has in the US market per quarter.	Id.
Lerner from linear cost function	Variant of the Lerner index where the marginal cost is estimated using a linear production function.	Id.
Lerner from total assets	Variant of the Lerner index where the marginal cost is estimated using total assets as the bank output.	Id.
Lerner from translog	Variant of the Lerner index where the marginal cost is estimated with parametric techniques (OLS) and a translog cost function.	Id.
<u>Loan-level explanatory variables</u>		
Downgrading	A dummy variable equal to one if the loan is downgraded and zero otherwise.	DealScan
Financial covenants	The number of financial covenants, taking values from zero to eight.	Id.
Collateral	A dummy variable equal to one if the loan is secured with collateral and zero otherwise.	Id.
Maturity	The natural logarithm of loan maturity in months.	Id.
Deal amount	The natural logarithm of the deal's loan amount.	Id.
Performance pricing	A dummy variable equal to one if the loan has performance pricing provisions and zero otherwise.	Id.
Default	A dummy variable equal to one when a borrower defaults and zero otherwise.	NGRB
<u>Bank-level explanatory variables</u>		
Non-performing loans	The ratio of non-performing loans to total loans weighted by the shares of each bank in the syndicated loan.	Call Reports
Tier 1 capital	The ratio of Tier 1 capital to total loans weighted by the shares of each bank in the syndicated loan.	Id.
Interest expenses	The ratio of interest expenses to total assets weighted by the shares of each bank in the syndicated loan.	Id.
Bank size	The natural logarithm of total assets weighted by the shares of each bank in the syndicated loan.	Id.
Deposits	The ratio of total deposits to total assets weighted by the shares of each bank in the syndicated loan.	Id.
<u>Firm-level explanatory variables</u>		
Number of loans	The total number of syndicated loans that a firm has received during a year.	DealScan
Firm size	The natural logarithm of total assets.	Compustat
Client	A dummy variable equal to one if the firm has had a previous lending relationship with the lead arranger in the past five years.	DealScan
Firm efficiency	The ratio of firm sales to total assets.	Compustat

Table 2. Summary statistics
The table reports summary statistics for the variables used in the empirical analysis. The variables are defined in Table1.

Variable	Level	Obs.	Mean	Std. Dev.	Min.	Max.
ROA	Firm	27,646	0.015	0.456	-49.874	1.279
Tobin's q	Firm	24,552	0.500	0.390	-0.883	3.012
ROI	Firm	28,875	0.028	0.179	-4.195	11.566
Leverage	Firm	28,865	0.300	0.218	0.000	6.879
Lerner index	Bank	28,786	0.037	0.051	-0.172	0.881
Lerner weighted by predicted shares	Bank	28,811	0.028	0.040	-0.050	0.688
Lerner weighted by bank market shares	Bank	28,811	0.130	0.124	-0.173	0.915
Lerner from linear cost function	Bank	28,786	0.037	0.051	-0.166	0.879
Lerner from total assets	Bank	28,789	0.042	0.057	-0.126	0.889
Lerner from translog	Bank	28,691	0.025	0.042	-0.097	0.887
Downgrading	Loan	28,875	0.274	0.446	0.000	1.000
Default	Loan	28,875	0.024	0.154	0.000	1.000
Financial covenants	Loan	28,875	1.924	1.498	0.000	7.000
Collateral	Loan	28,875	0.377	0.485	0.000	1.000
Maturity	Loan	28,875	3.574	0.704	0.000	5.257
Deal amount	Loan	28,875	6.113	1.239	-0.734	10.653
Performance pricing	Loan	28,875	0.660	0.474	0.000	1.000
Non-performing loans	Bank	28,001	0.000	0.001	0.000	0.072
Tier 1 capital	Bank	28,001	0.019	0.044	0.000	2.432
Interest expenses	Bank	28,850	0.002	0.003	0.000	0.046
Bank size	Bank	28,001	2.147	2.760	0.000	20.928
Deposits	Bank	28,001	0.078	0.105	0.000	0.924
Number of loans	Firm	28,875	1.324	0.613	1.000	5.000
Firm size	Firm	25,101	7.935	1.750	-0.254	14.458
Client	Firm	28,875	0.572	0.495	0.000	1.000
Firm efficiency	Firm	25,067	0.981	0.828	-0.095	11.623

Table 3. Bank market power and firm performance before the loan origination

This Table reports coefficients and t-statistics (in parentheses). The dependent variable is the Lerner index. The variables are defined in Table 1. Each observation in the regressions corresponds to a different loan facility. All regressions include various types of fixed effects and the standard errors are robust with different levels of clustering as shown in the last rows of the Table. The *, **, *** marks denote statistical significance at the 10, 5, and 1% level, respectively.

	I	II	III	IV	V
Firm ROA	-0.004**	-0.009**	-0.009**	-0.009***	-0.009***
	(-2.378)	(-2.280)	(-2.380)	(-3.150)	(-2.900)
Downgrading	0.000*	0.000	0.000	0.000*	0.000
	(1.846)	(1.130)	(1.080)	(1.710)	(1.200)
Default	0.000	0.002	0.002	0.002	0.002
	(0.213)	(1.030)	(1.030)	(1.510)	(1.160)
Financial covenants	0.000	-0.000	-0.000	-0.000	-0.000
	(1.122)	(-1.020)	(-0.910)	(-0.900)	(-1.630)
Collateral	-0.001	-0.001**	-0.001**	-0.001	-0.001
	(-1.245)	(-2.300)	(-1.890)	(-1.190)	(-1.350)
Maturity	-0.001**	-0.000	-0.000	-0.000	-0.000*
	(-2.474)	(-1.250)	(-1.100)	(-0.670)	(-1.790)
Deal amount	-0.001**	-0.002***	-0.002***	-0.002***	-0.002***
	(-2.465)	(-4.300)	(-4.500)	(-4.840)	(-8.050)
Performance pricing	-0.001**	-0.000	-0.000	-0.000	-0.000
	(-2.157)	(-0.680)	(-0.720)	(-0.630)	(-0.640)
Non-performing loans	-0.643	0.260	0.257	0.260	0.260
	(-0.364)	(0.320)	(0.320)	(0.360)	(0.600)
Tier 1 capital	0.038	0.003	0.003	0.003	0.003
	(0.758)	(0.150)	(0.150)	(0.200)	(0.250)
Bank size	0.013***	0.017***	0.017***	0.017***	0.017***
	(3.205)	(6.260)	(6.320)	(7.740)	(15.960)
Deposits	0.106	-0.020	-0.020	-0.020	-0.020
	(1.126)	(-0.310)	(-0.310)	(-0.530)	(-0.710)
Number of loans	0.000	0.000	0.000	0.650	0.000
	(0.877)	(1.100)	(1.450)	(0.607)	(0.990)
Firm size	-0.000	-0.003***	-0.003***	-0.003**	-0.003***
	(-0.055)	(-5.230)	(-5.270)	(-2.650)	(-7.320)
Client	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-4.072)	(-4.820)	(-4.880)	(-4.170)	(-5.250)
Firm efficiency	-0.000	-0.002***	-0.002**	-0.002***	-0.002***
	(-0.992)	(-2.720)	(-2.500)	(-2.680)	(-2.650)
Observations	24,967	24,967	24,967	24,967	24,967
R-squared	0.861	0.955	0.955	0.955	0.955
Bank FE	Yes	No	No	No	No
HDFE	No	Yes	Yes	Yes	Yes
Purpose	No	No	Yes	No	No
Cluster	Bank	Bank	Bank	Year	Loan facility

Table 4. Bank market power and firm performance before the loan origination: Sensitivity analysis
This Table reports coefficients and t-statistics (in parentheses). The dependent variable is the Lerner index. The variables are defined in Table 1. Each observation in the regressions corresponds to a different loan facility. All regressions include high dimensional bank and firm fixed effects and the standard errors are robust with different levels of clustering as shown in the last row of the Table. The *, **, *** marks denote statistical significance at the 10, 5, and 1% level, respectively.

	I	II	III	IV	VI
	Lerner weighted by predicted shares	Lerner weighted by bank market shares	Lerner from translog	Loan-deal level analysis	Lead arrangers only
Firm ROA	-0.007**	-0.035**	-0.008*	-0.013***	-0.038*
	(-2.470)	(-2.600)	(-1.850)	(-2.680)	(-1.910)
Downgrading	0.000	0.002*	0.001	-0.000	0.001
	(0.950)	(1.930)	(1.520)	(-0.520)	(0.701)
Default	0.002	-0.004	0.002	0.005	0.003
	(1.030)	(-0.560)	(0.820)	(1.600)	(0.340)
Financial covenant	0.000	0.002***	-0.000	-0.001*	-0.001
	(0.980)	(2.790)	(-1.230)	(-1.790)	(-0.810)
Collateral	-0.001**	-0.006***	-0.001***	-0.001	0.001
	(-2.290)	(-4.070)	(-3.210)	(-0.670)	(0.540)
Maturity	-0.000***	-0.003***	-0.001*	-0.001	0.000
	(-3.360)	(-3.090)	(-1.770)	(-1.230)	(0.190)
Deal amount	-0.001***	-0.008***	-0.003***	-0.005***	-0.007***
	(-2.820)	(-3.800)	(-4.370)	(-9.020)	(-6.500)
Performance pricing	0.000	-0.002	-0.001	-0.000	-0.000
	(0.460)	(-1.300)	(-1.500)	(-0.210)	(-0.030)
Non-performing loans	1.658	-0.313	0.087	0.349	1.884*
	(1.390)	(-0.310)	(0.090)	(0.780)	(1.650)
Tier 1 capital	-0.020	0.018	0.016	0.009	0.152
	(-0.890)	(0.790)	(0.570)	(0.610)	(0.900)
Bank size	0.016***	0.017***	0.010**	0.018***	0.019***
	(4.690)	(6.190)	(2.200)	(18.680)	(4.330)
Deposits	0.004	0.005	0.026	-0.042	-0.109
	(0.050)	(0.070)	(0.250)	(-1.640)	(-1.09)
Number of loans	0.000	0.002	0.000	-0.000	-0.001
	(0.990)	(1.500)	(0.670)	(-0.360)	(-0.340)
Firm size	-0.003***	-0.012***	-0.005***	-0.005***	-0.004
	(-4.080)	(-3.800)	(-7.020)	(-6.040)	(-1.510)
Client	-0.001***	-0.006***	-0.002***	-0.004***	-0.003**
	(-3.810)	(-5.050)	(-5.840)	(-6.020)	(-2.340)
Firm efficiency	-0.001*	-0.005*	-0.002***	-0.005***	-0.001
	(-1.960)	(-1.820)	(-2.720)	(-3.680)	(-0.150)
Observations	24,991	24,991	24,936	10,732	2,950
R-square	0.940	0.916	0.897	0.947	0.984
Cluster	Bank	Bank	Bank	Loan	Bank

Table 5. The impact of bank's market power on corporate performance after the loan origination

This Table reports coefficients and t-statistics (in parentheses). The dependent variable is the ROA. The variables are defined in Table 1. Each observation in the regressions corresponds to a different loan facility. All regressions include high dimensional bank and firm fixed effects and the standard errors are robust with different levels of clustering as shown in the last row of the Table. Joint significance is the p-value of the F-test for the joint significance of the coefficients on Lerner index and Lerner index squared. Turning point is the point on the Lerner index at which its effect on ROA turns negative. The *, **, *** marks denote statistical significance at the 10, 5, and 1% level, respectively.

	I	II	III	IV	V	VI
	All controls	Non-linearity (baseline)	Lerner weighted by predicted shares	Lerner weighted by bank market shares	Loan-deal level analysis	Repeated syndicate members
Lerner index	0.231***	0.327***	0.333***	0.171***	0.361***	0.371**
	(3.352)	(3.311)	(4.157)	(3.525)	(4.160)	(2.860)
Lerner index squared		-0.225	-0.426**	-0.163**	-0.239	-0.287
		(-1.125)	(-2.527)	(-2.178)	(-1.440)	(-1.580)
Downgrading	-0.020***	-0.020***	-0.020***	-0.020***	-0.018***	-0.020***
	(-4.831)	(-4.833)	(-4.797)	(-4.781)	(-6.220)	(-4.070)
Default	-0.058***	-0.058***	-0.061***	-0.060***	-0.064**	-0.055
	(-3.253)	(-3.258)	(-3.471)	(-3.450)	(-3.030)	(-1.100)
Financial covenant	-0.002	-0.002	-0.003	-0.003	-0.003	-0.002
	(-1.023)	(-1.022)	(-1.069)	(-1.067)	(-1.360)	(-0.750)
Collateral	-0.008	-0.008	-0.007	-0.008	-0.003	-0.008
	(-1.003)	(-0.976)	(-0.933)	(-1.017)	(-0.560)	(-0.990)
Maturity	0.007***	0.007***	0.007***	0.007***	0.006***	0.004**
	(3.172)	(3.195)	(3.294)	(3.341)	(4.570)	(2.710)
Deal amount	-0.008**	-0.008**	-0.009**	-0.007**	-0.009***	-0.010**
	(-2.166)	(-2.107)	(-2.456)	(-2.111)	(-4.230)	(-2.660)
Performance pricing	0.009*	0.010*	0.009*	0.010**	0.009**	0.014**
	(1.854)	(1.870)	(1.837)	(1.965)	(2.540)	(2.720)
Non-performing loans	-1.001	-1.055*	0.014	-0.004	-0.970	0.050
	(-1.634)	(-1.759)	(0.018)	(-0.018)	(-1.400)	(0.040)
Tier 1 capital	0.022	0.024*	0.010	0.000	0.018	-0.007
	(1.629)	(1.807)	(0.613)	(0.016)	(1.230)	(-0.300)
Interest expenses	-3.101***	-3.152***	-2.745***	-0.784***	-1.416**	-1.482
	(-3.485)	(-3.496)	(-3.364)	(-3.024)	(-2.800)	(-1.930)
Bank size	-0.005*	-0.005**	-0.002	-0.002**	-0.006*	-0.007*
	(-1.886)	(-2.043)	(-0.945)	(-2.165)	(-2.220)	(-2.390)
Deposits	0.077	0.077	-0.023	0.019	0.041	0.168*
	(1.312)	(1.316)	(-0.506)	(1.181)	(0.790)	(2.350)
Number of loans	-0.008**	-0.008**	-0.008**	-0.008**	-0.011***	-0.008**
	(-2.312)	(-2.315)	(-2.291)	(-2.316)	(-4.330)	(-2.830)
Firm size	-0.030***	-0.030***	-0.030***	-0.030***	-0.025***	-0.027**
	(-4.676)	(-4.678)	(-4.739)	(-4.615)	(-5.120)	(-3.160)
Client	0.002	0.002	0.002	0.002	0.000	0.006
	(1.116)	(1.148)	(1.086)	(1.205)	(0.190)	(1.790)
Firm efficiency	0.017**	0.017**	0.017**	0.017**	0.019***	0.025**
	(2.362)	(2.369)	(2.300)	(2.368)	(3.330)	(2.700)
Observations	24,035	24,035	24,058	24,058	10,268	4,608
R-squared	0.831	0.831	0.831	0.831	0.872	0.788
Joint significance		0.000	0.000	0.000	0.000	0.010
Turning point		0.727	0.391	0.525	0.755	0.646
HDFE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Firm	Firm	Firm	Firm	Loan	Loan

Table 6. Robustness for alternative measures of corporate performance
This Table reports coefficients and t-statistics (in parentheses). The dependent variable of each regression is reported in the second line of the Table. The variables are defined in Table 1. Each observation in the regressions corresponds to a different loan facility. All regressions include high dimensional bank and firm fixed effects and the standard errors are clustered by firm. Joint significance is the p-value of the F-test for the joint significance of the coefficients on Lerner index and Lerner index squared. Turning point is the point on the Lerner index at which its effect on ROA turns negative. The *, **, *** marks denote statistical significance at the 10, 5, and 1% level, respectively.

	I	II	III
Dependent variable	Tobin's q	ROI	Leverage
Lerner index	1.265***	0.224***	-0.482***
	(5.328)	(2.920)	(-3.414)
Lerner index squared	-1.463***	-0.066	0.600***
	(-3.143)	(-0.378)	(2.790)
Downgrading	-0.039***	-0.019***	0.011**
	(-3.848)	(-4.810)	(2.354)
Default	0.044	-0.060***	0.010
	(1.516)	(-3.303)	(0.412)
Financial covenant	0.010***	-0.001	-0.006*
	(2.830)	(-0.496)	(-1.728)
Collateral	-0.028**	-0.011*	0.027***
	(-2.323)	(-1.745)	(3.316)
Maturity	0.029***	0.005***	-0.009***
	(6.542)	(2.604)	(-4.375)
Deal amount	-0.020***	-0.005*	0.024***
	(-3.685)	(-1.654)	(5.621)
Performance pricing	-0.012	0.007*	-0.003
	(-1.640)	(1.870)	(-0.536)
Non-performing loans	-8.722***	-0.929	2.421**
	(-3.112)	(-1.479)	(2.103)
Tier 1 capital	0.190***	0.024*	-0.030
	(3.709)	(1.774)	(-1.290)
Interest expenses	-14.839***	-1.997**	1.772*
	(-5.765)	(-2.533)	(1.802)
Bank size	-0.010	-0.004**	0.004
	(-1.603)	(-2.211)	(1.265)
Deposits	0.085	0.038	-0.022
	(0.732)	(0.930)	(-0.390)
Number of loans	-0.007	-0.006*	0.015***
	(-0.822)	(-1.846)	(3.517)
Firm size	-0.094***	-0.029***	-0.004
	(-7.338)	(-5.823)	(-0.673)
Client	0.006	0.000	-0.000
	(0.808)	(0.063)	(-0.106)
Firm efficiency	0.019	0.015**	-0.015*
	(1.423)	(2.458)	(-1.935)
Observations	20,638	24,031	24,024
R-squared	0.889	0.823	0.889
Joint significance (P-value)	0.000	0.002	0.002
Turning point	0.432	1.697	0.402

Table 7. Robustness for variants of the Lerner index

This Table reports coefficients and t-statistics (in parentheses). The dependent variable is the ROA. The variables are defined in Table 1. Each observation in the regressions corresponds to a different loan facility. The Lerner index in Column I is the Lerner from a linear cost function, in Column II the Lerner from total assets, and in Column III the Lerner from translog (see Table 1 for more details). All regressions include high dimensional bank and firm fixed effects and the standard errors are clustered by firm. Joint significance is the p-value of the F-test for the joint significance of the coefficients on Lerner index and Lerner index squared. Turning point is the point on the Lerner index at which its effect on ROA turns negative. The *, **, *** marks denote statistical significance at the 10, 5, and 1% level, respectively.

	I	II	III
	Lerner from linear cost function	Lerner from total assets	Lerner from translog
Lerner index	0.296***	0.243***	0.222***
	(3.035)	(2.705)	(2.578)
Lerner index squared	-0.195	-0.131	-0.173
	(-0.992)	(-0.783)	(-0.735)
Downgrading	-0.020***	-0.020***	-0.020***
	(-4.833)	(-4.829)	(-4.833)
Default	-0.058***	-0.058***	-0.057***
	(-3.250)	(-3.243)	(-3.239)
Collateral	-0.008	-0.008	-0.008
	(-0.979)	(-0.989)	(-0.966)
Covenant	-0.002	-0.003	-0.003
	(-1.026)	(-1.041)	(-1.044)
Maturity	0.007***	0.007***	0.007***
	(3.186)	(3.185)	(3.202)
Deal amount	-0.008**	-0.008**	-0.008**
	(-2.130)	(-2.158)	(-2.105)
Performance pricing	0.010*	0.010*	0.010*
	(1.867)	(1.867)	(1.877)
Non-performing loans	-1.093*	-0.937	-1.052*
	(-1.830)	(-1.547)	(-1.746)
Tier 1 capital	0.025*	0.019	0.023*
	(1.873)	(1.436)	(1.779)
Interest expenses	-3.310***	-3.461***	-3.508***
	(-3.681)	(-3.730)	(-3.950)
Bank size	-0.005*	-0.005*	-0.002
	(-1.921)	(-1.775)	(-0.981)
Deposits	0.084	0.080	0.064
	(1.410)	(1.363)	(1.116)
Number of loans	-0.008**	-0.008**	-0.008**
	(-2.313)	(-2.314)	(-2.297)
Firm size	-0.030***	-0.030***	-0.030***
	(-4.692)	(-4.716)	(-4.646)
Client	0.002	0.002	0.002
	(1.134)	(1.109)	(1.118)
Firm efficiency	0.017**	0.017**	0.017**
	(2.366)	(2.359)	(2.384)
Observations	24,035	24,038	24,005
R-squared	0.831	0.831	0.830
Joint significance	0.004	0.012	0.006
Turning point	0.759	0.927	0.642