BANK LOANS AND BANKS' CORPORATE CONTROL: EVIDENCE FOR PORTUGAL*

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ABSTRACT

Banks' corporate control of firms is likely to increase the likelihood of providing a future loan as it mitigates information asymmetry and agency costs of debt. Using a sample of retail loans to Portuguese firms, we find that a bank corporate control enhances the probability of providing a future loan by 10 percentage points relative to a relationship lender with no control. This finding is robust to the inclusion of many firm-level controls and to instrumental variable methods to correct for the potential endogeneity of banks' equity stakes in borrower firms. The effect is lower when the borrower has multiple lending relationships or multiple banks as shareholders. Our results suggest that banks' corporate control affect the choice of the lender in the corporate loan market.

1. INTRODUCTION

Bank loans are the most common source of external finance for corporations worldwide. For countries in the euro area, loans are by far the most important source of debt financing of firms compared with debt securities, which account for less than 10 percent of total debt. Banks have advantage in accessing and producing information on the companies they lend to by developing close relationships with them. In fact, repeated loan transactions and delivery of other financial services are associated with a build-up of property information in the bank-firm relation, with significant benefits for the lender. This is supported by theoretical studies and empirical evidence.[1]

Bank-firm relationships extend beyond just repeated lending interactions. In fact, universal banks act as lenders, but they also underwrite and trade securities, hold equity stakes in corporations, and manage mutual funds. Thus, there is room for banks to play a prominent role in the governance of corporations.[2] In addition, a growing channel of bank influence over firm governance is through institutional holdings. Many universal banking groups have developed large asset management arms in recent years, such as bank trust services, mutual funds, and pension funds. These funds can and do invest in the same firms to which banks make loans and in which they have equity stakes.

In this work, the effect of banks' involvement in corporate governance as shareholders on access to the loan market is examined for Portuguese firms. Credit availability is of major importance, in particular

* The opinions expressed are those of the authors and not necessarily those of Banco de Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the authors.

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1 See Boot (2000) for a survey of this literature. Other articles include Bharath *et al*. (2007).

2 Bank stakes are rare in the U.S., given the historical restrictions of the Glass-Steagall Act on bank ownership of non-financial firms. Several other countries allow banks to take equity stakes in non-financial corporations (see Santos (1998) for a survey).

credit to small and medium-sized firms as these firms are said to be crucial to the development of many economies. We first test if an insider bank can be a more effective monitor and mitigate financial constraints. With the additional information they obtain as shareholders of the firm, banks may be able to better screen loans and obtain private information on the financial status of the borrowing firm. If banks share these information rents with firms, we expect to see more lending when a bank plays a role in the governance of a firm. A testable implication therefore is that an insider bank is more likely to capture the future lending business of its borrower:

– Hypothesis 1 (H1): Banks with equity stakes on a given firm face an higher probability of attracting future lending business from that firm.

Our second hypothesis relates to the strength of the relationship as this strength is also likely to affect the choice of future lenders. Indeed, firms with a stronger relationship with the insider bank may find it easier to obtain credit from that bank. In addition, they may not face many financing alternatives available due to an adverse selection problem as they may be locked-in by the insider bank.[3] We capture this idea in our second hypothesis:

– Hypothesis 2 (H2): The stronger the relationship between the firm and the insider bank, the higher the probability of attracting future lending business from that firm.

A sample of loans to private and publicly listed non-financial Portuguese firms over 2001-2007 is used to study the effect of banks' corporate control in the firms' access to the credit market. Our sample is dominated by private firms, where information asymmetry and agency costs of debt are likely to be high.

Concerning hypothesis 1, results indicate that firms tend to get more loans from banks that hold their equity than from other banks. Banks with a control stake in the firm are roughly 10 percentage points more likely to be picked as future lenders than banks with no such stake. Regarding hypothesis 2, we find that the probability that an insider bank provides a future loan decreases with the borrower's number of lending relationships and the borrower's number of bank shareholders, where these variables were used as proxy for the strength of relationship. These findings are consistent with hypothesis 2.

The article proceeds as follows. In Section 2 we present a brief review of the literature. Section 3 describes the data and presents descriptive statistics. Section 4 presents the methodology and the main empirical results. Finally, the main conclusions of this article are presented in the last section.

2. Related literature

Banks' stakes on non-financial firms can provide them access to information on the firm's financial health. Indeed, the borrower may be inclined to reveal more information to the bank, and the bank itself has greater incentives to produce information (Boot (2000)). Whenever a banker sits on a board, it will gain access to additional information that can provide some control over a borrower. This may affect the firm's access to the credit market if the insider bank is a potential lender.

Other authors have studied prior lending activity and its effect on the probability that banks extend loans and win underwriting mandates (Yasuda (2005), Bharath *et al*. (2007), and Drucker and Puri (2005)). Evidence so far on the influence of banks on corporations through equity stakes or board seats is mixed (Drucker and Puri (2006)). In Germany, Gorton and Schmid (2000) found that banks use their equity holdings and board seats to improve firm performance, while more recently Dittman, Maug, and Schneider (2007) found evidence that bank representation on the boards of non-financial firms is not necessarily in the best interest of firms. In Japan, firms with close bank ties have higher borrowing costs (Weinstein

3 A bank's special position as an insider may also allow the bank to extract rents from its information monopoly and potentially to "hold-up" a firm due to information asymmetries between other lenders and the borrower (Sharpe (1990) and Rajan (1992)).

and Yafeh (1998)); they also experience poorer profitability (Morck, Nakamura, and Shivdasani (2000)); adopt policies that favor creditors over shareholders (Morck and Nakamura (1999)); and face higher bond underwriting fees (Yasuda (2007)). In Europe, Kracaw and Zenner (1998) find a negative stock price reaction to bank loans if a banker sits on a borrower's board of directors.

Our research contributes to the literature on relationship banking by using insider stakes to capture how dependent the firm is on its lender. Other authors focus on other measures of the intensity of bank-firm relationships such as the geographic distance between bank and borrower (Petersen and Rajan (1994), Degryse and Ongena (2005)); the duration of the relationship (Petersen and Rajan (1994), Berger and Udell (1995), Degryse and Van Cayseele (2000), and Ongena and Smith (2001)); and the nationality of both bank and borrower (Carey and Nini (2007) and Houston, Itzkowitz, and Naranjo (2007)). The evidence favors improved credit availability, but there is mixed evidence regarding borrowing costs. Berger and Udell (1995) find that firms with longer lending relationships pay lower interest rates, while Degryse and Van Cayseele (2000) find contract terms deteriorate with the duration of relationships in Europe.

Our findings suggest that universal banks involvement in non-financial corporations as shareholders has implications in the credit market. An insider bank is likely to be the firm's main lender, which may generate benefits to the firm in terms of credit availability but can also hold up the firm. This information monopoly could be later exploited by the insider bank by extracting rents from the firm. This finding suggests that regulators should be aware of the credit market implications of policies regarding the structure of the banking system, in particular in what respects the involvement of banks as shareholders of non-financial firms.

An important concern with our findings is that a bank's presence as a equity holder arises endogenously in response to governance issues (Adams, Hermalin, and Weisbach (2010)). Indeed, a bank could become an insider in firms that face difficulties to access to credit markets and have higher borrowing costs. We address this concern in several ways. As a first approach, we measure bank equity stakes with a one-year lag relative to the lender choice. The results are also consistent if we measure bank equity stakes using a three-year lag. We also show that the positive effect of a bank insider stake on the lender choice remains strong after controlling for a long list of possible covariates. Moreover, the results are robust to the inclusion of firm (and bank) fixed effects. As a last approach to address endogeneity concerns, several estimations using instrumental variables are carried out.

3. Data

We use an unique data set constructed from several data sources: the Securities Statistics Integrated System, the Central Credit Register, the Central Balance-Sheet Database, the *Quadros de Pessoal* and Thomson Reuters. The data covers the period from 2001 to 2007 and the analysis is restricted to the 20 largest banks operating in Portugal, when measured regarding credit granted or equity holdings.

The Securities Statistics Integrated System gathers information on equity and debt securities issued by non-financial firms allowing to identify the Portuguese non-financial firms on which banks have equity stakes, as well as the market value of their positions. This data source also allows us to identify if the equity stake and the debt security is hold by the bank or through a mutual fund or other institution belonging to the banking group.

The Central Credit Register, managed by Banco de Portugal, collects monthly information on loans granted to non-financial corporations by all credit institutions operating in Portugal. We use information from this database to also compute the number of banking relationships of each firm and the market share of banks in terms of credit granted to firms.

Additional data for this work comes from the Central Balance-Sheet Database, providing the accounting information on firms, such as assets, equity, debt, interest paid and earnings. The two other data sources,

Quadros de Pessoal and Thomson Reuters, are used to complement the database with additional variables on firms. From the *Quadros de Pessoal* database, which is a mandatory employment survey collected yearly by the Portuguese Ministry of Labor and Social Security, we are able to collect information on the existence of foreign shareholders in the company. Information on which firms are publicly listed is obtained from Thomson Reuters.

As the objective of this work is to test if a bank is more likely to grant a loan to a firm where it has an equity stake, we need to construct all possible pairs between banks and borrower firm. Hence, for each firm and for each year, we expanded the database to consider all possible combinations between each firm and the largest 20 banking groups operating in Portugal. Notice that some of these pairs are matched, that is, the bank that holds the equity stake lends to the firm; while others are not matched. In addition, firms where banks do not have equity stakes were also included as a control group. Given that the sample period covers the period 2001-2007, 20 banking groups and more than 2,000 firms, the sample has more than 300,000 observations. These figures are restricted to non-financial firms which have information on both the Central Credit Register and the Central Balance-Sheet Database for at least four years in the sample period and that have annual total assets of at least ten million euros.

Table 1 presents the detailed definition of variables. There are variables concerning the credit relationship and bank ownership between banks and firms; firm variables that allow the characterization of the firms in the sample and a bank variable that measures the market share of the bank in terms of credit granted to non-financial firms. Our sample comprises a total of 874 bank equity stakes in the 2001-2007 period, corresponding to a total of 454 firm-year observations. Across this period of time, banks have an equity stake on about 60 Portuguese firms and each firm has, in most cases, 1 or 2 banking groups

Table 1

DEFINITION OF VARIABLES	
The equity stake is defined as the market value of the equity stake as a percentage of the book value of equity if higher than one per cent.	
Bank-firm variables	
Loan (dummy)	Dummy variable that takes the value of one if the banking group grants credit to the firm, and zero otherwise.
Loan (%)	Variable that measures the credit granted by the banking group as a percentage of total loans of the firm.
Bank ownership (dummy)	Dummy variable that takes the value of one when there is an equity stake, and zero otherwise.
Bank ownership (%)	Variable that measures the equity stake when it exists, and zero otherwise.
Bank public debt ownership (dummy)	Dummy variable that takes the value of one if the banking group owns debt securities of the firm, and zero otherwise.
Bank public debt ownership (%)	Variable that measures the value of debt securities owned by the baking group as a percentage of total debt of the firm.
Credit relationship	Variable that measures the credit granted by the banking group as a percentage of total loans of a given firm at the end of the year prior to the loan.
Firm variables	
Assets	Logarith of total assets.
Return on investment	EBITDA as a percentage of total assets.
Tangible fixed assets	Tangible fixed assets as a percentage of total assets.
Interest coverage	EBITDA as a percentage of interest paid.
Leverage	Financial debt as a percentage of total assets.
Number of lending relationships	Number of banking groups granting credit or setting credit lines to a given firm. If a financial institution does not belong to a banking group it is taken as a banking group itself.
Number of financial shareholders	Total number of banking groups with an equity stake on a firm, where a financial institution not belonging to a banking group was assumed as a banking group itself.
Bonds	Dummy variable equal to 1 if the firm has public debt and zero otherwise.
Foreign capital	Variable that measures the percentage of capital owned by foreigners.
Listed	Dummy variable equal to 1 if the firm is publicly traded and zero otherwise.
Bank variables	
Bank market share	Bank market share measured in terms of credit granted to non-financial corporations.

Sources: *Quadros de Pessoal*, Thomson Reuters and Banco de Portugal (Central Credit Register, Central Balance-Sheet Database).

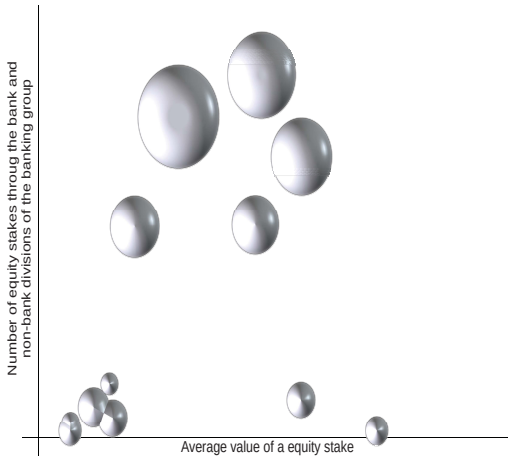
as shareholder. Equity stakes are more frequent in the bank division than on non-bank divisions (i.e., insurance companies, mutual funds, venture capital and pension funds).

Chart 1 presents a characterization of the number and average value of equity stakes across banks with diverse dimensions (the size of the circle measures the market share of the bank). As expected, larger banks have a higher number of participations through the bank and non-bank divisions than smaller banks. In turn, the heterogeneity in the average value of the equity stake across smaller banks is larger than across larger banks. In our sample, the average equity stake per observation, measured as a percentage of the book value of equity is 12%, while the median is 5%.

Chart 2 presents summary statistics for the loan variable and firm-level variables. This characterization is independently carried out for firms with equity stakes hold by banks and for the ones without equity stakes hold by banks. Concerning loans granted by banks as a percentage of the total loans of the firm, we observe that loans granted by banks that are simultaneously creditors and shareholders of the firm

Chart 1

CHARACTERIZATION OF BANKS WITH EQUITY STAKES

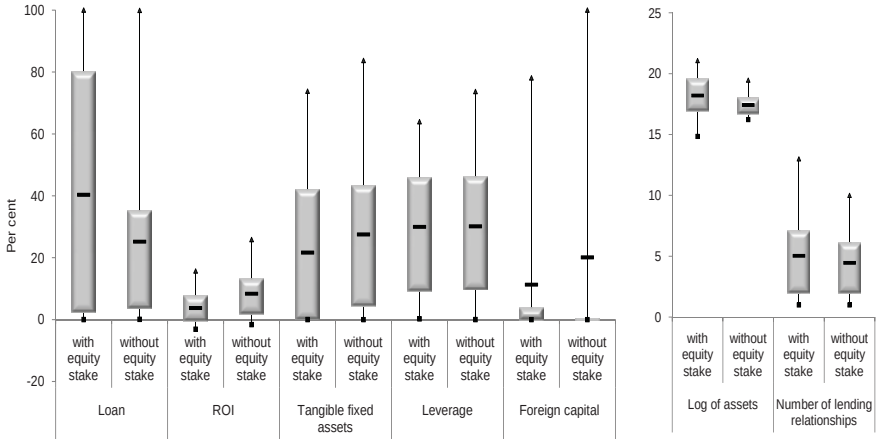


Source: Authors' calculations.

Note: The size of the circle measures the market share of each bank.

Chart 2

DESCRIPTIVE STATISTICS



Source: Authors' calculations.

Notes: The triangles represent the percentile 95 and the squares represent percentile 25. The lower and upper limits of the grey area correspond to percentiles 25 and 75, respectively. The dash corresponds to the average value. All variables as defined in table 1.

represent, on average, 40% of the total loans of the firm. Taking into account all firm/bank observations when the bank does not have an equity stake, the average loan is lower (25%), implying that when a bank has an equity stake in a given firm it is more likely to grant a loan to that firm.

Firms where banks have an equity stake are, on average, slightly larger but with less tangible assets. Firms where banks have an equity stake are also less profitable and the importance of foreign shareholders is smaller. We do not observe a significant difference in the number of banking relationships between the two groups of firms. The analysis of other variables not presented in this article, but available in Antão, Ferreira and Lacerda (2011), allows us to conclude that firms where banks have an equity stake are more likely to have public debt and to be publicly listed. These firms also present a lower interest coverage ratio.

4. Empirical results

A close relationship between a bank and a firm should be associated with a better information flow, allowing banks to better screen loans. In fact, the proximity between the bank and the borrower may overcome problems of asymmetric information. In this setting, the main objective of this work is to test if banks with equity stakes in a firm are more likely to capture future loans of that firm. To test this hypothesis, for each firm and in each year, we create a set of 20 potential lenders, which results in 20 firm-bank pairs per year. Each pair firm-bank, for each year, is the unit of observation in our sample. We estimate a logit model and a linear regression (OLS) model:

$$\begin{aligned}\text{Loan}_{i,g,t} &= \theta_t + \alpha_i + \varphi_g + \beta(\text{Bank Ownership})_{i,g,t-1} \\ &+\gamma(\text{Credit Relationship})_{i,g,t} + \delta X_{i,t-1} + \lambda Y_{g,t} + \varepsilon_{i,g,t}\end{aligned} \quad (1)$$

where $\text{Loan}_{i,g,t}$ is a dummy variable equal to one if bank g grants credit to firm i in year t and zero otherwise in the case of the logit model; or the credit granted by bank g to firm i as a percentage of the total loans of the firm in year t in the case of the OLS model. $\text{Bank Ownership}_{i,g,t}$ is a dummy variable equal to one if bank g has an equity stake in firm i in year t, and zero otherwise; or the equity stake of bank g as a percentage of the book value of equity of firm i in year t; this variable is lagged one period. $\text{Credit Relationship}_{i,g,t}$ is the value of the loans that bank g granted to firm i at the end of the year before the variable Loan is assessed. $\text{X}_{i,t}$ are firm-level control variables, including assets (log), return on investment, tangible assets, interest coverage, leverage, number of banking relationships, number of bank shareholders, firm with public debt outstanding dummy variable and publicly traded firm dummy variable. All firm-level control variables are lagged one period. $\text{Y}_{g,t}$ is market share of each bank g considering only loans granted to the corporate sector in year t. θ_t is a year fixed effect, α_i is a firm (or industry) fixed effect, and φ_g is a bank fixed effect. We estimate a specification with industry and year fixed effects and a specification with firm, bank and year fixed effects. Standard errors are adjusted for clustering at the firm level.

4.1. Results for hypothesis 1

Table 2 reports the estimates of equation (1) when testing hypothesis 1 that banks with equity stakes on a given firm face a higher probability of attracting future lending business from that firm. Columns (1)-(4) report the results for the logit specification and columns (5) and (6) report the results for the OLS specification. In order to avoid spurious inference we exclude outliers winsorizing the variables. The coefficient on the bank ownership variable is positive and statistically significant in all specifications. The effect is also economically significant.

The results in table 2 show that the positive effect of bank ownership on the choice a future lender is robust in several ways. First, we use a continuous variable for bank ownership. Second, we use an OLS

Table 2

EFFECT OF BANK EQUITY STAKE ON LENDING

Variables	(1)	(2)	(3)	(4)	(5)	(6)
Bank ownership (dummy)	0.695***	0.411*			0.021***	
	(3.55)	(1.87)			(2.63)	
Bank ownership (%)			3.575***	3.239***		0.169***
			(4.60)	(2.79)		(3.54)
Bank market share	11.655***	9.589***	11.673***	9.580***	0.343***	0.343***
	(78.58)	(12.33)	(78.72)	(12.32)	(8.39)	(8.39)
Credit relationship	12.404***	8.763***	12.403***	8.763***	0.706***	0.705***
	(27.69)	(29.49)	(27.69)	(29.48)	(113.22)	(113.10)
Industry dummies	Yes	No	Yes	No	No	No
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Bank dummies	No	Yes	No	Yes	Yes	Yes
Firm dummies	No	Yes	No	Yes	Yes	Yes
Model	Logit	Conditional logit	Logit	Conditional logit	OLS	OLS
pseudo-R2		0.501		0.501	0.592	0.592
Semi-elasticity (bank ownership)	0.107***		0.437***			
	(2.93)		(4.60)			
Number of observations	268887	264349	266667	264349	268887	268887

Source: Authors' calculations.

Notes: In columns 1 to 4, the dependent variable takes a value of one if the banking group grants credit to the firm in a given year and zero otherwise. In columns 5 and 6, the dependent variable is the weight of the credit granted by a banking group to a firm in a given year on the total credit of the firm in the same year. All variables as defined in table 1. Robust t-statistics adjusted for firm clustering are in parenthesis. ***, ** and * indicate significance at the 1%, 5% and 10% level.

specification where the dependent variable is the share of loans of the bank in a firm. Finally, we estimate a specification with firm (and bank) fixed effects. The firm fixed effects results show that time-invariant unobservable firm characteristics do not seem to explain our findings.

Using the estimate of the bank ownership (dummy) coefficient in column (1), the predicted probability of a bank granting credit to a firm if it does not have an equity stake in the firm is 14%, while the predicted probability of granting credit to the firm if it has an equity stake is 25% (other variables evaluated at their means). Thus, holding everything else equal, the probability of a bank granting credit to a firm is increased by 10.7 percentage points if it has an equity stake in the borrowing firm.

Other explanatory variables have the predicted sign and have a significant impact on the lender choice. The market share of the bank in the loan market has a positive and significant coefficient. Using the estimates in column (1), we observe that when the market share is increased from the 5th- to the 95th-percentile, the probability of a bank granting credit to a firm increases by 40 percentage points. In addition, the existence of a past credit relationship has a positive and significant coefficient, which indicates that past lending relationships increase the likelihood that the bank will be chosen for future loans by the same firm.

Table 3 presents the results of robustness checks that include additional control variables. We first control for bank public debt ownership, *i.e.*, if the bank granting the credit also own debt securities issued by the firm. We consider both a dummy variable and a continuous variable similar to the bank equity ownership. We also include other firm-level control variables, including firm size, profitability, leverage, interest, assets tangibility, number of banking relationships, number of financial shareholders, if the firm has debt securities and if it has foreign shareholders. Our results remain robust as the coefficient of the Bank Ownership variable is positive and significant. Firm size and the number of banking relationships have a positive and significant effect on granted loans, while interest coverage has a negative effect.

We conducted other robustness tests. We check the sensitivity of the results to a different definition of bank equity stakes, that uses a different reference value – equity stakes are positive only if they are

Table 3

EFFECT OF BANK EQUITY STAKE ON LENDING | ROBUSTNESS TESTS

Variables	(1)	(2)	(3)	(4)
Bank ownership (dummy)	0.501*		0.021***	
	(2.11)		(2.54)	
Bank ownership (%)		3.638***		0.173***
		(2.92)		(3.32)
Bank market share	9.208***	9.142***	0.342***	0.339***
	(10.21)	(10.15)	(6.61)	(6.65)
Credit relationship	9.351***	9.353***	0.704***	0.703***
	(24.82)	(24.81)	(99.35)	(100.86)
Bank public debt ownership (dummy)	0.367**		-0.000	
	(2.43)		(-0.07)	
Bank public debt ownership (%)		0.742		0.020
		(0.79)		(0.44)
Log of assets	0.249***	0.250***	0.001*	0.001*
	(5.06)	(5.10)	(1.74)	(1.73)
Return on investment	0.051	0.053	-0.002	-0.001
	(0.21)	(0.22)	(-0.41)	(-0.42)
Tangible fixed assets	0.245	0.243	-0.001	-0.001
	(1.58)	(1.57)	(-0.73)	(-0.76)
Interest coverage	-0.001**	-0.001***	-0.000	-0.000
	(-2.46)	(-2.46)	(-0.77)	(-0.76)
Leverage	0.152	0.155	-0.000	-0.001
	(1.47)	(1.50)	(-0.83)	(-0.93)
Number of lending relationships	0.145***	0.150***	-0.000	0.000
	(18.40)	(18.37)	(-0.00)	(0.01)
Number of financial shareholders	-0.001	-0.002	0.000	0.000
	(-0.20)	(-0.21)	(1.42)	(1.40)
Bonds	0.043	0.044	0.000	0.000
	(1.05)	(1.08)	(0.63)	(0.59)
Foreign capital	-0.001	-0.001	0.000	0.000
	(-0.91)	(-0.91)	(0.78)	(0.77)
Year dummies	Yes	Yes	Yes	Yes
Bank dummies	Yes	Yes	Yes	Yes
Firm dummies	Yes	Yes	Yes	Yes
Model	Conditional logit	Conditional logit	OLS	OLS
pseudo-R2	0.509	0.509	0.589	0.589
Number of observations	193 292	193 292	196 355	196 355

Source: Authors' calculations.

Notes: In columns 1 and 2, the dependent variable takes a value of one if the banking group grants credit to the firm in a given year and zero otherwise. In columns 3 and 4, the dependent variable is the weight of the credit granted by a banking group to a firm in a given year on the total credit of the firm in the same year. All variables as defined in table 1. Robust t-statistics adjusted for firm clustering are in parenthesis. ***, ** and * indicate significance at the 1%, 5% and 10% level.

above 5% of the book value of equity, rather than 1%. We find that the predicted probability of a bank granting credit to a firm increases from 14% if it does not have an equity stake in the firm to 28% if it has an equity stake. We next estimate specifications to take into account the division within the banking group that has the equity stake on the firm. We divide bank divisions into two groups: banks and non-banks (mutual fund, pension fund, venture capital or insurance company). Non-bank divisions cannot grant loans, but can invest in the borrowing firm. Moreover, the rationale for investing in a firm may be different across the different types of bank divisions. We find that the probability of a bank granting credit to a firm is increased by 14 percentage points if it has an equity stake in the borrowing firm through the bank. Moreover, we find a similar effect if the equity stake is owned by a non-bank division bank of the banking group. Overall, our results are robust to these alternative definitions of the size and type of bank equity stake.

4.2. Results for hypothesis 2

In this section we test hypothesis 2 that stronger firm-bank relationships have an effect on the probability of an insider bank to grant a loan to the firm. From the firm's point of view, a stronger bank relationship may be considered valuable as banks may be more willing to make unprofitable loans to customers during difficult financial times when they trust losses will be recouped over the course of a long relationship. On the other hand, banks may acquire private information over the course of a relationship and effectively "lock-in" customers. Several empirical studies use the duration of a bank borrower relationship as a measure of the strength of relationship. Petersen and Rajan (1994) and Berger and Udell (1995) find that the duration of the bank-borrower relationship positively affects the availability of credit. This result is consistent with the idea that the longer the duration of the relationship, the greater the information exchange. On the other hand, Ongena and Smith (2000) conclude that the value of a relationship declines through time and that firms are able to end relationships early, possibly to avoid lock-in. Moreover, the ability of one bank to hold-up a firm is lower for firms with alternative sources of bank credit.

To test hypothesis 2, we estimate the logit and OLS models with firm and bank fixed effects in equation (1) including an interaction term of the bank ownership variable with a firm variable. For our empirical tests, we use two variables to proxy for the strength of the relationship between the firm and the bank: the number of banking relationships and the number of financial shareholders of the firm. We expect that a firm with a higher number of lending relationships or a higher number of financial shareholders to have a lower likelihood to select the insider bank as future lender. In contrast, firms with a lower number of lending relationships, or financial shareholders, are more likely to rely on the insider bank, as they are more exposed to adverse selection (lemons problem) if they do not use the insider bank to obtain credit.

The coefficient of the interaction terms are negative and significant in both cases, suggesting that the positive impact of bank ownership on credit granted decreases with the number of lending relationships and the number of financial shareholders (See table 4). Firms with more lending relationships tend to be able to obtain credit form other banks besides the insider bank, which contributes to reduce the ability of the insider bank to hold-up the firm. Insider banks of firms with more financial shareholders may have access to less information. In both cases, the effect of the insider bank of the choice of future lenders decreases. In general, the results are consistent with hypothesis 2 but results need to be interpreted with caution as the marginal effect, and its significance level depends on the different values taken by the variables.

4.3. Endogeneity

Endogeneity problems are ubiquitous in empirical research on corporate governance. In our setting, there could be many reasons for bank equity stakes and lender choice to be jointly determined. We have already addressed the potential endogeneity problem using firm fixed effects methods that control for unobserved sources of firm heterogeneity. Fixed effects methods solve joint determination problems in which an unobserved time-invariant variable simultaneously determines both lender choice and bank ownership. It is also equivalent to looking only at within-firm changes in bank ownership. The fixed effects results go a long way toward dismissing omitted variables explanations as sources of endogeneity. Because only the effects of within-firm changes in bank ownership are taken into account, firm-specific omitted variables cannot explain the observed relation between lender choice and banker ownership.

Another approach to address endogeneity concerns is to use lagged bank ownership as an explanatory variable. We have done so in all our estimations. However, one could think that a one-year lag is not sufficient to address the joint determination concern. Thus, we estimate the logit and OLS models with firm and bank fixed effects in equation (1) with bank ownerships measured with a three-year lag.

Table 4

THE STRENGHT OF RELATIONSHIPS				
Variables	(1) Number of lending relationships	(2) Number of financial shareholders	(3) Number of lending relationships	(4) Number of financial shareholders
Bank ownership (dummy)	1.286***	0.732***	0.044**	0.033***
	(3.37)	(2.58)	(2.52)	(2.88)
Bank ownership x firm variable	-0.145***	-0.017***	-0.004	-0.001**
	(-3.20)	(-2.76)	(-1.65)	(-2.30)
Firm variable	0.175***	0.001	-0.000	-0.000
	(23.16)	(0.26)	(-0.06)	(-0.39)
Bank market share	9.031***	8.615***	0.343***	0.343***
	(11.64)	(12.37)	(8.39)	(8.39)
Credit relationship	8.623***	8.762***	0.706***	0.706***
	(29.92)	(29.49)	(113.19)	(113.17)
Year dummies	Yes	Yes	Yes	Yes
Bank dummies	Yes	Yes	Yes	Yes
Firm dummies	Yes	Yes	Yes	Yes
Model	Conditional logit	Conditional logit	OLS	OLS
pseudo-R2	0.505	0.501	0.592	0.592
Number of observations	264 349	264 349	268 887	268 887

Source: Authors' calculations.

Notes: In columns 1 and 2, the dependent variable takes a value of one if the banking group grants credit to the firm in a given year and zero otherwise. In columns 3 and 4, the dependent variable is the weight of the credit granted by a banking group to a firm in a given year on the total credit of the firm in the same year. All variables as defined in table 1. Robust t-statistics adjusted for firm clustering are in parenthesis. ***, ** and * indicate significance at the 1%, 5% and 10% level.

We also use two-stage least squares (2SLS) address the potential endogeneity. Two-stage least squares methods allow us to address omitted variables and reverse causality issues simultaneously. To assess the robustness of our conclusions from our instrumental variable tests, we employ an additional empirical strategy that involves estimating the effect of an endogenously chosen dummy variable (bank ownership) on another endogenous variable, which is continuous (credit granted by a bank to the firm as a percentage of the total loans of the firm). This set-up can be estimated using the treatment effects model. Details for this analysis can be found in Antão, Ferreira and Lacerda (2011). The coefficient is positive and significant. Thus, after controlling for endogeneity, in both 2SLS and a treatment effects model, we continue to find that banks with equity stakes in the borrower are more likely to be chosen to provide future loans.

5. Conclusion

Our paper aims to measure the effects of a bank corporate control, through equity stakes, in the credit market, in particular in the choice of the lender. As the establishment of an equity link with a borrower allows for more efficient information production and processing in offering future loans, a lender with an equity stake in the borrower should be more likely to secure the future business of its borrowers.

Using a sample of Portuguese private and publicly listed firms, we find that the existence of an equity stake in a borrower significantly increases the likelihood of winning this borrower's future loan business. Our findings are not explained by bank reputation, past lending relationships and a variety of firm characteristics such as firm size and complexity, performance, ownership structure, and leverage, among others. Moreover, the results are robust to the inclusion of firm (and bank) fixed effects. The firm fixed-effects specification controls for unobserved sources of firm heterogeneity and solves problems in which an unobserved time-invariant variable simultaneously determines both the lender choice and the bank equity stake in the borrower firm.

Our findings suggest that universal banks involvement in non-financial corporations as shareholders has implications in the credit market. An insider bank is likely to be the firm's main lender, which may generate benefits to the firm in terms of credit availability but can also hold up the firm.

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