

**RELATIONSHIP LENDING AND SME FINANCING IN THE CONTINENTAL  
EUROPEAN BANK-BASED SYSTEM**

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**ABSTRACT**

This paper analyzes the relationship between banks and SMEs in the continental European bank-based system. We find that SMEs with longer bank relationships have enhanced access to loans, but at the same time they bear a higher cost for their debt. We also find that firms maintaining two bank relationships get the cheapest debt, which establishes a limit for the degree of concentration of bank relationships. Our results also show that the existence of trust between firm and bank improves access to financing and reduces the borrowing costs, whereas it increases the likelihood that guarantees will have to be provided. As a consequence, it seems that a relationship based on trust is a better strategy to improve SMEs' access to finance than the establishment of longer or more concentrated relationships.

**Keywords:** Relationship lending, SME, competition, commitment, asymmetric information, cost of debt, loan availability, trust, guarantees.

**JEL classification:** G21, G24, G32

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# **RELATIONSHIP LENDING AND SME FINANCING IN THE CONTINENTAL EUROPEAN BANK-BASED SYSTEM.**

## **1. Introduction**

Since Petersen and Rajan's (1994) seminal paper, both the duration of a bank-borrower relationship (length) and the number of bank relationships (concentration) have become the most commonly used proxies for measuring relationship lending in applied empirical work for small and medium-sized enterprises (SMEs). Empirical evidence in the continental European bank-based systems shows that relationship lending might not be entirely beneficial for SMEs<sup>1</sup>. Longer or more concentrated relationships reduce the firm's flexibility to change banks and provide the lender with monopoly power to extract rents via higher interest rates. This raises the question of whether there is a better way of establishing relationship lending for firms in creditor oriented economies.

Elsas and Krahen (1998) and Elsas (2005) argue that relationship lending does not depend on its duration or the existence of other lenders financing the firm, but rather on the housebank status of the lender. Housebanks often serve as a prime example of relationship lending (Edwards and Fischer, 1994), and they are considered to be the firm's main lender, with the capacity to generate more and better information than other financial intermediaries. Thus, we hypothesize that housebanking relationships will improve access to financing and at the same time reduce borrowing costs.

In this context, the aim of the present research is twofold. First, we provide additional empirical evidence of the effect of length and concentration on the availability and cost of debt, as well as the guarantees required from SMEs, within a continental European bank-based system. This will allow us to confirm whether banks exploit SMEs with which they establish closer relationships by charging higher interest rates. Second, we analyze the influence of the housebanking relationship on SME financing and compare the effects with

those of the traditional proxies. Following Harhoff and Korting (1998) we characterize the relationship between the housebank and the borrower through the existence of considerable trust between the two parties.

We use a unique survey data set composed of firms from the region of Murcia (south-eastern Spain). Our data set fits our purposes for several reasons. First, the financial system in the region of Murcia is dominated by banks, as it is in most continental European countries. Second, we have access to a detailed description of the bank-borrower relationship and the financing characteristics. And third, firms in our sample are small and young and they do not receive the attention of the financial press and the rating agencies, increasing the need for relationship lending to mitigate asymmetric information problems (Petersen and Rajan, 1994; Berger and Udell 1995).

We find that SMEs with longer bank relationships have enhanced access to loans, but at the same time they incur higher costs for their debt. We also show that SMEs working with two banks obtain the cheapest debt, which establishes a limit for the degree of concentration of the bank relationship. These results confirm that longer or more concentrated bank relationships are not always beneficial for SMEs operating within a continental European bank-based system. Regarding the housebanking relationship, we find that the existence of trust between firm and bank improves access to financing and reduces the borrowing costs, whereas it increases the likelihood that guarantees will have to be provided. Consistent with our expectations, it seems that a relationship based on trust is a better strategy to improve SMEs' access to finance than the establishment of longer or more concentrated relationships.

The paper proceeds as follows: Section 2 discusses previous research on the relationship lending issue for SMEs, Section 3 describes the data and methodology, Section 4 presents the results, and Section 5 concludes.

## 2. Theoretical framework and empirical evidence

Relationship lending implies the existence of specific information on the borrower, which is available only to the financial intermediary and the customer (Diamond, 1984). This privacy increases security and raises the value of the firm's strategic information, encouraging the entrepreneur to transmit data (Yosha, 1995; Bhattacharya and Chiesa, 1995; Rheinbaben and Ruckes, 2004) and the bank to carry out costly monitoring work (Cole, 1998; Boot, 2000; Carletti, 2004). As a consequence, relationship lending should improve the bank's knowledge of the characteristics of both the firm and its projects, making it less risky for the bank to grant a loan. For the borrower, this should translate into an increased availability of debt and a lower cost of capital (Petersen and Rajan, 1994; Boot and Thakor, 1994; Berger *et al.*, 2001).

The asymmetric evolution of the information between the relationship lender and the other banks reduces *ex-post* competition (Sharpe, 1990), increasing the costs that the firm would incur refinancing its projects with another bank (Greenbaum *et al.*, 1989; Howorth *et al.*, 2003). This reduces the firm's flexibility to leave the relationship and provides the bank with monopoly power, which has three main effects. First, Sharpe (1990) argues that the lenders might use the monopoly power to offer uncompetitive conditions and hence to obtain the so-called monopoly rents. Second, the firm's reduced flexibility to change lenders increases the willingness of the bank to invest in monitoring the firm (Chan *et al.*, 1986; Bhattacharya and Thakor, 1993). Third, reduced competition allows the bank to extract returns in the long term to offset initial losses arising when granting loans to small or young firms, or those with financial problems (Mayer, 1988; Petersen and Rajan, 1995; Berlin, 1996). As a consequence of these effects, the availability of debt should increase, but in exchange the firm would have to compensate the bank via more severe conditions on its future loans and credits.

Existing empirical evidence indicates that SMEs that strengthen their bank relationships experience less credit rationing in the bank credit market (Petersen and Rajan, 1994, in the US; Harhoff and Körting, 1998, in Germany; and de Bodt *et al.*, 2005, in Belgium), are more likely to be granted a loan (Cole, 1998, in the US), suffer fewer liquidity constraints (Angelini *et al.*, 1998, in Italy) and can count on higher participation by the bank in their financing (Machauer and Weber, 1998, in Germany). In contrast, the evidence is not so clear-cut when we analyze the terms of the debt. With reference to the cost, European small firms that maintain more prolonged relationships (Angelini *et al.*, 1998, in Italy, and Degryse and Van Cayseele, 2000, in Belgium) or work with fewer intermediaries (Angelini *et al.*, 1998) pay more for their bank resources. In contrast with this, US banks charge lower interest rates to SMEs with which they maintain longer-lasting (Berger and Udell, 1995) or more concentrated (Petersen and Rajan, 1994) relationships. With regard to guarantees, SMEs borrowing from fewer banks (Harhoff and Körting, 1998) or prolonging their bank relationships (Berger and Udell, 1995; Harhoff and Korting, 1998; Degryse and Van Cayseele, 2000) are less likely to provide guarantees, while the evidence reported by Machauer and Weber (1998) for the German market points in the opposite direction.

The above evidence suggests that firms in continental European financial systems that reduce the number of bank relationships or increase their duration might confer a monopoly power on the bank to extract rents via higher interest rates. However, if European firms decide to weaken their bank relationships in order to reduce the lender's monopoly power, the findings suggest that this can make the granting of loans and credit less attractive to the bank. Hence the question arises as to whether there is a better way of establishing a relationship lending for firms in creditor oriented economies.

According to Elsas and Krahn (1998) the existence of relationship lending does not depend on the duration of the relationship or the existence of other lenders financing the firm,

but rather on the bank's participation in the firm's financing, on its capacity to generate information and on its commitment to aid the firm when it experiences financial difficulties. Financial intermediaries complying with these requisites are known as housebanks and are regarded as the firm's main lender, with the capacity to generate more and better information than the other financial intermediaries. In the German market, Elsas and Krahnert (1998) find that housebanks are particularly committed to firms, raising their participation in the firm's financing during temporary shocks in the borrower's situation, whereas other lenders cut theirs. Machauer and Weber (1998) and Lehmann and Neuberger (2001) find that housebanks participate more in the financing of the firm, and this effect is stronger when the borrower is in financial difficulties, although they also show that firms pledge more guarantees to their housebank than to other financial intermediaries because the former has an informational advantage when evaluating and selecting the assets. Thus, when the firm requests a loan from another bank, it cannot pledge the same quantity or quality of guarantees.

Harhoff and Körting (1998) establish that one of the attributes characterizing the relationship between a firm and its housebank is the existence of considerable trust between them. Their findings suggest that German SMEs that build more trusting relationships with their bank incur reduced costs and pledge less guarantees for their financing. Consequently, in contrast with the traditional indicators of relationship lending such as concentration and duration, we anticipate that a banking relationship based on trust between borrower and lender will improve access to financing and at the same time reduce borrowing costs. On the basis of this hypothesis we develop our analysis.

### **3. Data and methodology**

In this section we present the data set and the methodology we use in the empirical analysis to assess the effect of lending relationships on the availability and terms of SMEs' financing.

#### Data

The main problem encountered when researching the bank relationships of SMEs is the scarcity of the existing data on the relationship itself. In order to carry out this study, we use a detailed database compiled by the Economic Observatory of SMEs<sup>2</sup> of the region of Murcia (south-eastern Spain). This database comprises 530 non-financial firms responding to a personal questionnaire directed to the chief executive<sup>3</sup>. From the original sample, we select 322 firms whose accounting information (balance, profit and loss) from the years 1999 and 2000 were available in the SABI database<sup>4</sup>. After eliminating cases with errors in the accounts and lost values in some of the variables, the definitive sample comprised 182 SMEs, with a statistical error of 7.34 per cent at the 95 per cent confidence level.

Although the sample comes from a particular region of Spain, there are no special characteristics in the way that the banks, the environment, loans, government regulations, or even laws operate in that region compared to other parts of Spain. Moreover, in a comparative study of the banking sector in the Spanish regions conducted by Carbó *et al.* (2000), the region of Murcia is found to be within the national average for a series of parameters, such as concentration of branches, loans as a proportion of deposits, volume of loans per branch and volume of deposits per branch.

### Methodology

We now describe the models we have used to analyze the effect the bank relationship has on debt availability, cost and guarantees.

#### *Debt availability*

Analysis of the availability of loans and credit poses serious difficulties for researchers (Petersen and Rajan, 1994). The debt ratio of a firm is a bad approximation, because it is simultaneously determined both by the supply of and the demand for financing. As a consequence, changes in the debt ratio may be due either to variations in the demand on the part of the firm or to variations in the supply offered by the bank.

We should also take into account the fact that the existence and strength of relationship lending is not equally important during the negotiation of all loans and credit. Instead, two very different situations can be distinguished (Berger and Udell, 1995). On the one hand, there is the short-term loans and credit used mainly to finance firms' production cycles, where the bank takes into account the state of its relationship with the customer (relationship-based lending). And on the other, there are the isolated loans that firms tend to request to cover one-off needs, when the bank evaluates the specific risk of the operation in question (transaction-based lending).

In order to get round these two problems, our analysis focuses on the ease with which a firm renews its short-term loans and credit. In this way, we avoid the problem of simultaneity, since we do not analyze the volume of financing but rather its renewal. At the same time we study short-term debt, which is more susceptible to the influence of the state of the relationship between the lender and borrower. We obtain the information required for this analysis from the survey conducted by the *Observatorio Económico de la PYME*. Specifically, managers were asked to give their opinion on the following statement: “*Your*



*short-term debt with financial institutions (loans and credit) is automatically renewed on maturity*". From the responses, ranging from 1 (totally disagree) to 5 (totally agree), we define the dummy variable Renewal, which takes value 1 when the response exceeds the scale median and 0 otherwise.

The effect of the bank relationship on access to bank debt is analyzed through the following model<sup>5</sup>:

$$\text{Renewal}_i = \beta_0 + \beta_1 \text{ Firm Characteristics} + \beta_2 \text{ Trust} + \beta_3 \text{ Concentration} + \beta_4 \text{ Length} + \beta_5 \text{ Lines of Credit} + \varepsilon_i \quad (1)$$

As explanatory variables, we use certain characteristics of the firm which allow us to reduce the impact of sample heterogeneity (Harhoff and Körting, 1998). Specifically, we include three dummy variables measuring whether the firm belongs or does not belong to each of the three activity sectors considered, the natural logarithm of the age of the firm (number of years since the foundation of the firm) and size (net turnover). In addition, we use cash flow as a proportion of total assets (Solvency) to measure the firm's capacity to finance itself, together with an indicator of financial leverage (liabilities as a proportion of total assets).

The relationship between firm and housebank has been identified by the existence of considerable trust between both parties, in much the same way as used in the process followed by Harhoff and Körting (1998). We obtain this information from the personal survey carried out by the *Observatorio Económico de la PYME*. Trust is measured by asking firm managers their opinion on the following statement: "*When granting finance, the financial institutions take their trust in the firm's managers into account*". Responses are based in a five-point scale (1 = totally disagree, 5 = totally agree).

Together with Trust, we include the most commonly used variables in the literature to analyze the existence and strength of the bank relationship: Concentration and Length. Thus,

the variable Concentration is defined as the natural logarithm of 1 plus the number of banks with which the firm works. With regards Length, this is measured by the natural logarithm of the number of years that the firm has worked with its oldest bank<sup>6</sup>. We use the oldest relationship because SMEs start out working with a single bank and tend to stay with this institution for many years, although they can borrow from other financial intermediaries after the initial years (Farinha and Santos, 2002). Thus, the oldest bank probably provides most of the financing and services to the firm (Degryse and Van Cayseele, 2000).

Finally, the repeated use of certain types of financing, such as lines of credit, can generate economies of scale and produce an experience effect that may favour renewal. One of the sections of the questionnaire asked the managers to indicate, from 1 (never) to 5 (always), the frequency with which they use lines of credit. From their responses, we measure the variable Lines of Credit. Incorporating this variable into Model (1) allows us to control for the heterogeneity in the use of lines of credit among the sample firms.

#### *Cost of debt*

In order to analyze the effect of trust, concentration and duration of the bank relationship on the cost of debt for SMEs, we consider the following model:

$$\begin{aligned}
 \text{Cost of Debt}_i = & \beta_0 + \beta_1 \text{ Firm Characteristics} + \\
 & + \beta_2 \text{ Trust} + \beta_3 \text{ Concentration} + \beta_4 \text{ Length} + \\
 & + \beta_5 \text{ Discount for Early Payment} + \beta_6 \text{ Suppliers} + \\
 & + \beta_7 \text{ Long - Term Bank Debt} + \beta_7 \text{ Short - Term Bank Debt} + \varepsilon_i
 \end{aligned} \tag{2}$$

where the variables measuring the characteristics of the firm and relationship lending are defined as in Model (1).

The dependent variable is defined as the ratio of financing charges to liabilities<sup>7</sup>. This measure of the cost of debt is subject to certain considerations, which should be taken into account to avoid bias in the estimation of the variable. First, in addition to the interest rate, the financing charges include other concepts such as commissions and discounts for prompt payment offered to the firm's customers. The reduction in intermediaries' margins in recent years has made commissions a very important source of income for banks (DeYoung and Roland, 2001) and consequently a very significant part of the financing charges borne by firms. Thus, introducing commissions as part of the cost of a debt may be more accurate than simply using the interest rate. With regard the discounts for prompt payment, the survey asked the managers about the frequency with which their firm offers such discounts: "*Yes, always; yes, frequently; occasionally; or never*". From the responses, scored from 1 to 4, we measure the variable Discounts for Early Payment. Introducing this variable into Model (2) allows us to measure the influence of charges deriving from discounts offered to customers.

Second, in addition to bank loans, liabilities include the credit granted by the firm's suppliers<sup>8</sup>. In order to avoid the distortions that this may cause in the analysis of the cost of debt, company managers were asked about the frequency with which they use delayed payments to suppliers as a source of financing. From the managers' responses, ranging from 1 (never) to 5 (always), we measure the variable Suppliers.

Finally, we must take into account the fact that the ratio of financing charges to liabilities does not allow us to analyze the interest rate charged by the bank for different kinds of loan and credit. Since banks tend to establish the interest rate on a loan as a function of its maturity (Gottesman and Roberts, 2004), we must control for the maturity structure of the firm's liabilities in order to avoid biasing the estimation of the explanatory variables. In the survey, managers were asked to indicate the frequency with which they used long-term and

short-term bank financing. From their responses, ranging from 1 (never) to 5 (always), we measure the variables Long-Term Bank Debt and Short-Term Bank Debt. With these variables, we can create a proxy measure for the maturity structure of the firm's liabilities.

### *Debt guarantees*

Lack of data tends to be a problem when examining the guarantees used in loan contracts. Company owners are very reluctant to provide information on the assets they have pledged as guarantees, especially when these are their own personal wealth. The survey here attempts to get round this problem by measuring the importance of guarantees in the granting of loans. The managers were asked for their opinion in relation to two statements: “*Financial institutions grant you loans and credit on the basis of personal guarantees*” and “*Financial institutions grant you loans and credit on the basis of collateral*”. From their responses, ranging from 1 (totally disagree) to 5 (totally agree), we define the dummy variables Personal Guarantees and Collateral respectively, which take value 1 when the response exceeds the median and 0 otherwise. These variables are used as dependent variables in the two models analyzing the effect of the bank relationship on the probability of providing personal guarantees and collateral:

$$\begin{aligned} \text{Personal Guarantess}_i &= \beta_0 + \beta_1 \text{ Firm characteristics} + \\ &+ \beta_2 \text{ Trust} + \beta_3 \text{ Concentration} + \beta_4 \text{ Length} + \\ &+ \beta_5 \text{ Long - Term Bank Debt} + \beta_6 \text{ Short - Term Bank Debt} + \varepsilon_i \end{aligned} \quad (3)$$

$$\begin{aligned} \text{Collateral}_i &= \beta_0 + \beta_1 \text{ Firm Characteristics} + \\ &+ \beta_2 \text{ Trust} + \beta_3 \text{ Concentration} + \beta_4 \text{ Length} + \\ &+ \beta_5 \text{ Long - Term Bank Debt} + \beta_6 \text{ Short - Term Bank Debt} + \varepsilon_i \end{aligned} \quad (4)$$

where the variables measuring the characteristics of the firm and the bank relationship are defined as in Models (1) and (2).

There have been many theoretical predictions concerning the use of guarantees in loan contracts. Gonas *et al.* (2004) identify three main reasons why guarantees are provided in bank loans and credit: (1) problems of adverse selection associated with the existence of asymmetric information; (2) problems of moral hazard; and (3) borrower risk.

In contexts of information asymmetry, various works (Besanko and Thakor, 1987; Chan and Thakor, 1987) suggest that guarantees may transmit relevant information to the lender and hence reduce the problem of adverse selection. Specifically, these studies predict a positive association between the use of guarantees and the severity of the information asymmetry problem, with the aim of distinguishing between potential borrowers in terms of risk. In contrast with this, Chan and Kanatas (1985) argue that the decision to secure debt is used to signal the high quality of the firm. Bester's (1985) model also predicts that guarantees are associated with high-quality borrowers.

The variables Size and Age – within the group of firm characteristics – provide proxies for the firm's information asymmetry problems. Some works (Petersen and Rajan, 1994; Harhoff and Körting, 1998) argue that the firm's age reflects the reputation that the firm openly transmits to the market, while Berger *et al.* (2001) state that the size of the borrower is in inverse proportion to its information opacity. It is assumed therefore that it will be less costly for a bank to obtain information about large firms or those with a long history. Consequently, a lender that is large (proxied by its sales) or old should be less likely to secure its loans. The relation is reversed when the firm uses the guarantees in order to signal its high quality.

The problem of moral hazard arises when borrowers have incentives to take on high risks during the lifetime of the loan or when they hide information during the negotiations

prior to the granting of the financing. Various researchers (Myers, 1977; Smith and Warner, 1979; Stulz and Johnson, 1985; Boot *et al.*, 1991) show that securing a loan reduces the likelihood that the borrower will engage in opportunistic behaviour that increases the risk of default.

Although theoretical work stresses the importance of moral hazard in loan contracts, actually testing this empirically is rather more difficult. Gonas *et al.* (2004) suggest that the severity of the borrower's moral hazard problem can be proxied by the maturity structure of their liabilities. They argue that adopting risks does not occur from one day to the next, but instead opportunistic behaviour is more likely where loans are made over six years than where they are made over six months. Consequently, longer-term loans should have more probability of being guaranteed than shorter-term loans. To test this phenomenon, we use the variables Long-Term Bank Debt and Short-Term Bank Debt defined previously.

Swary and Udell (1988) and Boot *et al.* (1991) show that riskier borrowers are more likely to secure their debts because, in the case of default on the part of the borrower, the bank can have recourse to the specific assets securing the loan – in the case of collateral – or the personal wealth of the company owner – in the case of personal guarantees – reducing lenders' losses. In contrast, Bester (1985), Besanko and Thakor (1987) and Chan and Kanatas (1985) predict that it will be the safest borrowers who pledge guarantees more frequently.

The best way of measuring a firm's credit risk is using the qualifications provided by the rating agencies or the opinions expressed by the bank in the borrower's credit file. However, access to internal documents in banks is extremely difficult and one of the problems of analyzing SMEs is the fact that accurate credit ratings do not exist. The alternative is to use accounting data. In this respect, two characteristics of firms – the capacity to generate cash flows and the level of financial leverage – can approximate the borrower's credit risk. In accordance with most of the findings of other researchers (Hester, 1979; Scott and Smith,

1986; Morsman, 1986; Leeth and Scott, 1989; Berger and Udell, 1990, 1992; Booth, 1992; Reig and Ramírez, 1998; Jiménez and Saurina, 2004), we would expect more indebted and less solvent firms – i.e. riskier companies – to be more likely to provide guarantees.

### *Descriptive analysis*

Table II reports in Panel A the correlations between the variables included in the previous models, and in Panel B the descriptive statistics of the variables utilized. We can see that the sample is basically made up of small and young firms. Specifically, half the firms are younger than 14.1 years and their sales (a proxy for their size) do not exceed 4,760,936 euros. The limited reputation of these firms and their small size severely limits the market's knowledge of their characteristics. Moreover, analysis of the relationship variables (Length and Concentration) suggests that private information is also very restricted. First, the SMEs in our sample work with an average of 2.56 banks, which reduces the number of institutions possessing high quality information about the firms. Second, the informational advantage of the oldest lender compared to competing institutions is substantial, since borrowers prolong their relationships for an average of 16.8 years. We would expect therefore that the firm's flexibility to change banks would be very limited and that the lender's monopoly power would be considerable. In this respect, firms that are trusted by the lender (75 per cent of firms score above 3 on a 5 point scale) may be exposed to less severe extraction of monopoly rents.

Among the financial features of the SMEs in our sample, we note the high level of financial leverage and the limited capacity to self finance. Specifically, 75 per cent of the firms have a debt level exceeding 56 per cent and more than half exceed 72 per cent. With regard to cash flows, 50 per cent of the firms generate volumes under 6.94 per cent of their assets. Similarly, we can see that the bank debt of the sample firms is basically made up of

long-term loans and lines of credit (on both variables, 50 per cent of firms score above 3 on a 5 point scale).

Thus, the sample is made up of firms that are small, have a limited public reputation, a high level of indebtedness, little capacity to self finance and a high percentage of short-term debt. The firms tend to remain with their first lender for many years and work with very few banks. These characteristics – typical of SMEs – are likely to determine the availability and terms of their debt. In this respect, we see that the average cost of debt is 4.01 per cent, and that in 48.9 per cent of the cases the debt is renewed automatically and that the probability of providing personal guarantees (collateral) is high for 42.86 per cent (26.37 per cent) of the firms.

#### **4. Trust, concentration and duration of bank relationship**

##### **4.1. Availability of debt**

Regression (1) in Table III shows the estimation by maximum likelihood of the probit Model (1). Firms using lines of credit more frequently and those belonging to the industrial sector renew their short-term loans and credit more easily. In contrast, renewal is less automatic for SMEs with a higher level of solvency, which might indicate their reduced use of short-term debt.

We find a positive and significant coefficient for the variables Trust (at the one per cent level) and Length (at the ten per cent level). The longer the relationship between the bank and the firm, the more likely it is that the loans and credit will be renewed automatically on maturity. This result is entirely consistent with the existing empirical literature (Petersen and Rajan, 1994; Angelini *et al.*, 1998; De Bodt *et al.*, 2005; Lehmann and Neuberger, 2001), as well as with Petersen and Rajan's (1994) theoretical prediction. Banks learn about the honesty of the manager, the viability of the projects and the borrower's risk as the borrower pays back



their loans. In addition, the bank's accuracy in predicting the firm's behaviour and its future income improves with the relationship. All this experience about the borrower allows the bank to reduce the risk assessment for each new loan, increasing its willingness to grant more resources. As for the existence of trust, a bank is more likely to renew financing to the firms with which it maintains a relationship based on trust. This result is consistent with the evidence reported by Lehmann and Neuberger (2001), and also with Harhoff and Korting's (1998) expectations.

We should stress that the economic impact of relationship characteristics on credit availability is important<sup>9</sup>. The probability of renewing the loan increases by 28.08 per cent when the variable Trust increases one standard deviation, whereas an increase of one standard deviation in the variable Length increases the probability of renewal by 20.63 per cent. As a consequence, from both the statistical and the economic point of view, the impact of Trust on credit availability is higher than that of Length.

We now estimate Model (1) omitting the variables Length and Concentration to check the robustness of the results. According to Harhoff and Korting (1998), the information contained in these variables may not be orthogonal to Trust, which would distort the estimation. The results remain qualitatively the same after excluding Length and Concentration in Regression (2), as shown in Table III. Thus, the effect of trust on debt availability appears to depend on more than just the passage of time or the competition from other banks.

#### **4.2. Cost of debt**

Regression (1) in Table IV contains the estimation by ordinary least squares of Model (2). Larger and older firms have a lower average cost of debt, suggesting the existence of lower informational asymmetries in those firms (Berger *et al.*, 2001; Berger and Udell, 1995),

whereas firms with higher degree of solvency and those in the Industry sector bear a higher cost for their debt. As for the financing characteristics, firms that grant discounts for prompt payment to their customers have cheaper debt.

It should also be noted that the sign of the coefficient of the variable Concentration is positive and significant, implying that firms working with fewer banks bear a lower cost for their debt. The firm's optimal choice of number of creditors is a question that has received a lot of attention in recent years<sup>10</sup>. Diamond (1984) and Ramakrishnan and Thakor (1984) argue that the optimal decision for a firm is to maintain a single bank relationship, since in this way they minimize monitoring costs, strengthen the link with their lender and avoid the free-rider problem. However, this may confer an information monopoly on the bank, which can be mitigated by adding an additional lender to generate competition (Rajan, 1992; Von Thadden, 1994)<sup>11</sup>. In order to confirm whether the cost of debt for SMEs that maintain one or two relationships differs from that of the rest, we replaced the variable Concentration with three dummy variables: One Relationship, Two Relationships and More than Two Relationships, which is coded one when the firm maintains one, two or more than two bank relationships respectively, and zero otherwise.

The results of this estimation, in which we only include the variables One Relationship and Two Relationships to avoid the problem of perfect multicollinearity, are shown in Regression (2) in Table IV. We can see that both coefficients are negative and significant and that the coefficient of the variable Two Relationships is higher – in absolute terms – than that of One Relationship. This implies that firms having two bank relationships get cheaper debt than firms maintaining an exclusive link, but the latter have lower borrowing costs than firms with more than two creditors. Carletti (2004) states that a bank monitors a firm more closely when it is the sole lender than when it finances the firm with another bank, because the presence of two lenders involves duplication of effort and sharing of monitoring benefits. Yet

borrowing from two banks does not necessarily imply a higher cost of financing. If there are diseconomies of scale in monitoring (reflecting the increasing difficulty of discovering more about a firm one already knows a lot about, or scarce resources for adequate monitoring), two-bank lending can be cheaper than single-bank lending<sup>12</sup>.

Inspection of Regression (2), Table IV, also reveals that the variables Trust and Length become significant with a negative and positive sign respectively. Consistent with the evidence reported by Angelini *et al.* (1998) and Degryse and Van Cayseele (2000) for the Italian and Belgian markets respectively we find that firms that prolong their relationship with their bank have more expensive debt<sup>13</sup>. In contrast, our results indicate that banks reduce financing charges for borrowers that they trust more. The economic impact of both relationship characteristics is of similar magnitude, although in opposite directions. An increase of one standard deviation in the variable Length produces an increase in the cost of debt of 14.55 per cent, whereas banks reduce interest charges by 13.72 per cent when trust in firms increases by one standard deviation. Hence it seems that the establishment of a relationship based on trust is more beneficial to the firm than the simple passage of time.

The above results seem to suggest that the effects of the variables Trust, Concentration and Length on the cost of debt are not orthogonal at all. To analyze those associations we use the medians of the variables Length and Concentration to divide the sample into four sub-groups, and re-estimate Model (2) in Table V: Regression (1) is estimated on firms with a bank relationship of less than or equal to 15 years; Regression (2) on firms with a bank relationship exceeding 15 years; Regression (3) on firms working with one or two banks; and Regression (4) on firms working with more than two banks.

In Table V, Regression (2) shows a positive sign for the coefficient of the variable Concentration, which implies that only firms whose bank relationship exceeds 15 years increase the cost of debt when they are working with more financial intermediaries. After 15

years of relationship, the bank may have acquired most of the relevant information on the firm and may use it to extract monopoly rents when the competition of other lenders threatens to undermine the relationship. In Regression (4), we find a negative coefficient for the variable Trust, which indicates that firms that work with more than two banks obtain cheaper debt if the lender trusts the firm. An increase in the competition may give rise to a commitment based on trust between the firm and the bank, which may translate into a reduction of financing charges.

#### **4.3. Probability of securing debt**

The result of the maximum likelihood estimation of the *Probit* Models (3) and (4) is presented in Regressions (1) and (2) respectively in Table VI. Of the variables measuring the strength of relationship lending, only the coefficient of Trust in Regression (2) is significant. Its positive sign indicates that the firms provide more collateral to the banks with which they maintain a relationship of trust. As Machauer and Weber (1998) and Lehmann and Neuberger (2001) point out, housebanks tend to be the firm's first lender, so they have an informational advantage that allows them to secure their loans with more and better guarantees.

We can see that smaller firms are more likely to provide collateral and personal guarantees, while younger firms more frequently use the personal wealth of their owners to secure their loans and credit. Given that the problem of adverse selection is more severe with these borrowers, these results suggest that the guarantees are being used as a mechanism to mitigate the problem caused by information asymmetry. We can also see that more indebted firms and less solvent ones are more likely to provide personal guarantees, which indicates that credit risk is also a determining factor in the requirement of guarantees. And finally, industrial sector firms are less likely to provide personal guarantees than firms in the construction and service sectors.

With regards the characteristics of the financing, firms that resort more to long-term loans are more likely to provide collateral (see Regression (2) in Table VI), while those that finance themselves with short-term debt use the personal wealth of the firm's owners to secure the loans (see Regression (1) in Table VI). This indicates a clear distinction in the use of the two types of guarantees according to the type of loan. On the one hand, longer-term loans, which are subject to a more severe problem of moral hazard, are secured with specific assets giving priority to the bank in the case of default. And on the other, shorter-term loans, in which there is less risk of opportunistic behaviour on the part of the borrower, are secured with the personal wealth of the owners, without this providing any prior claim on a particular asset. These results seem to suggest that banks also take moral hazard into account when deciding on their guarantee requirements.

The above results suggest that the use of guarantees is clearly associated with higher-risk firms (those that are smaller, younger, less solvent and more indebted). However, it is important to distinguish the risk of the borrower from that of the loan. According to Berger and Udell (1995), loans granted to riskier customers are not necessarily riskier themselves. The possibility of making claims against the guarantees reduces the risk of these loans, so that they can occasionally be safer than non-secured loans granted to less risky firms.

In order to determine whether secured loans are more or less risky than non-secured loans, Berger and Udell (1995) analyze the cost of debt as a function of the guarantee requirements. These authors interpret a positive association as an indication of the higher risk of guaranteed loans. Using a similar procedure, we include the scales that measure the use of personal guarantees and collateral as explanatory variables of the interest rate in Regressions (3) and (4) respectively in Table VI. The coefficient of the variable Personal Guarantees is statistically significant and has a positive sign, indicating that secured loans are riskier than unsecured ones.

## 5. Conclusions

Close observation of existing empirical evidence reveals that relationship lending might not be entirely beneficial for SMEs operating within continental European bank-based systems. The evidence shows that longer or more concentrated relationships reduce a firm's flexibility to change banks and might result in higher interest rates. Considering the importance of relationship lending for SMEs, we are interested to analyze an alternative way of strengthening relationship lending which results in more beneficial effects on SMEs financing. This, we think, is the housebanking relationship based on the existence of trust between banks and firms.

To shed light on this issue we analyze the effect of trust, concentration and length of the firm-bank relationship on the availability and cost of debt, as well as on the guarantees required, in a sample of Spanish SMEs. We find that firms maintaining longer relationships with their banks have greater access to debt, but at the same time they bear higher financial charges. Our results also show that there is a limit for the degree of concentration of bank relationships. SMEs that maintain two bank relationships have the lowest interest charges, followed by firms borrowing from only one bank, while firms working with more than two banks have the most expensive debt. When the relationship between firms and banks is based on trust (in a housebanking relationship), we find that SMEs improve their access to bank financing and also reduces the cost of debt, but firms have to pledge more guarantees.

The above results are consistent with the evidence reported in other creditor-oriented markets and confirm that the effects of longer or more concentrated bank relationships are not entirely beneficial for SME financing. They are either limited, as is the case for the association we find between cost of debt and concentration, or have a drawback, as in the case of the trade-off between availability and cost of debt that we show for the length of the relationship. In contrast with these results, the existence of trust between the bank and the

firm has more beneficial effects (higher availability and lower cost of debt) than detrimental (higher likelihood of providing guarantees) on SME financing. As a consequence, it seems that a relationship based on trust is a better strategy to improve an SME's access to finance.

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<sup>1</sup> According to Mayer (1994), in the Anglo-Saxon model the resources are channeled fundamentally via the financial markets, whereas in the Continental model most resources are channeled via financial intermediaries, basically the banks. See Appendix 1 for a review of the most important results on the effect of relationship lending on SMEs' financing.

<sup>2</sup> The Economic Observatory of SMEs of the region of Murcia (*Observatorio Económico de la Región de Murcia*) is a tool developed by the public development agency *Instituto de Fomento* of the region of Murcia to analyze the economic and business reality of SMEs, in order to aid decision-making on the part of the regional administration.

<sup>3</sup> The survey was conducted in the first half of 2001. The size of the sample was set to ensure that the margin of maximum error for the estimate of a proportion (relative frequency of answer in a specific item of a question) was less than 0.05 points with a level of confidence of 95%.

<sup>4</sup> The database SABI is compiled by the firm Bureau Van Dijk using the annual accounts filed in company registries by Spanish and Portuguese firms. We included only companies where the SABI database had accounting data available for the years 1999 and 2000 in order to obtain the average values of the balance sheet data.

<sup>5</sup> The variables included in this and the following models are described in Table I.

<sup>6</sup> The logarithmic transformation of this and other variables – Concentration, Size and Age – is very common in the bank relationship literature, since it is a monotonic transformation that does not alter the characteristics of the initial variable, and at the same time allows us to test whether the effect of the variable declines (Petersen and Rajan, 1994). Regarding the variable length, the censoring problem analyzed by Ongena and Smith (2001) does not apply because there is a big difference between their paper and ours. They study the determining factors of the whole length of the relationship, so they need to know not only the beginning but also the end of the relationship. We, on the other hand, are interested in the length of the relationship up to one specific date, regardless of when it will finish.

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<sup>7</sup> The financing charges do not include either variations in the provisions of the financial investment or negative foreign currency adjustments.

<sup>8</sup> The SABI database does not provide disaggregated data on the various sources of external financing used by firms. This prevents us from differentiating between resources coming from banks and those granted by suppliers.

<sup>9</sup> Following Kim et al. (1998) the economic impact of statistically significant explanatory variables is measured as the percentage of change (over the mean value) in the dependent variable due to a one standard deviation change in the explanatory variable, all other things being equal.

<sup>10</sup> According to Rheinbaben and Ruckes (2004), a firm's optimal bank financing policy is characterized not only by the number of banks but also by the amount of confidential information given to the creditor. Highly rated companies tend to deal with many creditors and disclose little private information, whereas firms whose initial credit rating is low must disclose a substantial amount of private information in order to reduce creditors' uncertainty about their quality. They can reduce the severity of information leakage by restricting themselves to a small number of creditors.

<sup>11</sup> Besides the competition, working with two creditors can be a wise decision because it may reduce the liquidity risk – the risk of early termination of profitable projects. As Detragiache et al. (2000) show, when the firm's adverse selection problem is important, which is the case for the SMEs in our sample, increasing the number of bank relationships increases the chance of finding one creditor ready to grant the financing, and hence of avoiding the early liquidation of the project.

<sup>12</sup> Firms that borrow from a smaller number of lenders might also obtain their resources paying a lower risk premium due to their higher quality (Cole, 1998; Farinha and Santos, 2000). To assess whether firms' quality differs according to their borrowing structure, in Appendix 2 we present the mean values of important indicators for groups of firms with one, two, or more than two lenders. We also provide the p-value of ANOVA models that test for significant differences of the means across the three groups. The results show that there are no differences in terms of working capital, cash flow generation, profitability and degree of capitalization between firms with different levels of borrowing concentration. Thus, they do not support the hypothesis that higher quality firms tend to maintain exclusive or highly concentrated bank relationships.

<sup>13</sup> It is also consistent with the model developed by Baas and Schrooten (2006).



## 6. References

- Angelini, P., R. Di Salvo and G. Ferri, 1998, 'Availability and Cost of Credit for Small Businesses: Customer Relationships and Credit Cooperatives', *Journal of Banking and Finance* 22, 925-954.
- Baas, T. and M. Schrooten, 2006, 'Relationship Lending and SMEs: A Theoretical Analysis', *Small Business Economics* 27, 127-137.
- Berger, A. and G. Udell, 1990, 'Collateral, Loan Quality, and Bank Risk', *Journal of Monetary Economics* 25, 21-42.
- Berger, A. and G. Udell, 1992, 'Some Evidence on the Empirical Significance of Credit Rationing', *Journal of Political Economy* 100 (October), 1047-1077.
- Berger, A. and G. Udell, 1995, 'Relationship Lending and Lines of Credit in Small Firm Finance', *Journal of Business* 68, 351-381.
- Berger, A., L. Klapper and G. Udell, 2001, 'The Ability of Banks to Lend to Informationally Opaque Small Businesses', *Journal of Banking and Finance* 25, 2127-2167.
- Berlin, M., 1996, 'For Better and for Worse: Three Lending Relationships', *Business Review* (November/December), 1-10.
- Besanko, D. and A. Thakor, 1987, 'Competitive Equilibrium in the Credit Market Under Asymmetric Information', *Journal of Economic Theory* 42, 167-182.
- Bester, H., 1985, 'Screening vs. Rationing in Credit Markets with Imperfect Information', *American Economic Review* 75, 850-855.
- Bhattacharya, S. and G. Chiesa, 1995, 'Proprietary Information, Financial Intermediation, and Research Incentives', *Journal of Financial Intermediation* 4, 328-357.
- Bhattacharya, S. and A. Thakor, 1993, 'Contemporary Banking Theory', *Journal of Financial Intermediation* 3, 2-50.

- Boot, A., 2000, 'Relationship Banking: What Do We Know?', *Journal of Financial Intermediation* 9, 7-25.
- Booth, J., 1992, 'Contract Costs, Bank Loans, and the Cross-Monitoring Hypothesis', *Journal of Financial Economics* 31, 2-41.
- Boot, A. and A. Thakor, 1994, 'Moral Hazard and Secured Lending in an Infinitely Repeated Credit Market Game', *International Economic Review* 35, 899-920.
- Boot, A. and A. Thakor, 2000, 'Can Relationship Banking Survive Competition?', *Journal of Finance* 55, 679-713.
- Boot, A., A. Thakor and G. Udell, 1991, 'Secured Lending and Default Risk: Equilibrium Analysis and Policy Implications and Empirical Results', *Economic Journal* 101 (May), 458-472.
- Carbó, S., F. Rodríguez and R. López del Paso, 2000, 'La competencia en el sector bancario español: una aproximación regional', *Papeles de Economía Española* 84-85, 268-280.
- Carletti, E., 2004, 'The Structure of Bank Relationships, Endogenous Monitoring, and Loan Rates', *Journal of Financial Intermediation* 13, 58-86.
- Chan, Y., S. Greenbaum and A. Thakor, 1986, 'Information Reusability, Competition and Bank Asset Quality', *Journal of Banking and Finance* 10, 255-276.
- Chan, Y. and G. Kanatas, 1985, 'Asymmetric Valuations and the Role of Collateral in Loan Agreements', *Journal of Money, Credit and Banking* 17, 84-95.
- Chan, Y. and A. Thakor, 1987, 'Collateral and Competitive Equilibria with Moral Hazard and Private Information', *Journal of Finance* 42, 345-364.
- Cole, R., 1998, 'The Importance of Relationships to the Availability of Credit', *Journal of Banking and Finance* 22, 959-977.

- De Bodt, E., F. Lobeze and J.C. Statnik, 2005, 'Credit Rationing, Customer Relationship and the Number of Banks: An Empirical Analysis', *European Financial Management* 11, 195-228.
- Degryse, H. and P. Van Cayseele, 2000, 'Relationship Lending Within a Bank-Based System: Evidence from European Small Business Data', *Journal of Financial Intermediation* 9, 90-109.
- Detragiache, E., P. Gazella and L. Guiso, 2000, 'Multiple versus Single Banking Relationships: Theory and Evidence', *Journal of Finance* 55, 1133-1161.
- DeYoung, R. and K. Roland, 2001, 'Product Mix and Earnings Volatility at Commercial Banks: Evidence from a Degree of Leverage Model', *Journal of Financial Intermediation* 10, 54-84.
- Diamond, D., 1984, 'Financial Intermediation and Delegated Monitoring', *Review of Economic Studies* 51, 393-414.
- Edwards, J. and K. Fischer, 1994, '*Banks, Finance and Investment in Germany*', Cambridge University Press, Cambridge.
- Elsas, R., 2005, 'Empirical Determinants of Relationship Lending', *Journal of Financial Intermediation* 14, 32-57.
- Elsas, R., and J. Krahen, 1998, 'Is Relationship Lending Special? Evidence From Credit-File Data in Germany', *Journal of Banking and Finance* 22, 1283-1316.
- Farinha, L. and J. Santos, 2002, 'Switching from Single to Multiple Bank Lending Relationships: Determinants and Implications', *Journal of Financial Intermediation* 11, 124-151.
- Gonas, J., M. Highfield and D. Mullineaux, 2004, 'When Are Commercial Loans Secured?', *Financial Review* 39, 79-99.

- Gottesman, A. and G. Roberts, 2004, 'Maturity and Corporate Loan Pricing', *Financial Review* 39, 55-77.
- Greenbaum, S., G. Kanatas and I. Venezia, 1989, 'Equilibrium Loan Pricing under the Bank-Client Relationship', *Journal of Banking and Finance* 13, 221-235.
- Harhoff, D. and T. Körting, 1998, 'Lending Relationships in Germany – Empirical Evidence from Survey Data', *Journal of Banking and Finance* 22, 1317-1353.
- Hester, D., 1979, 'Customer Relationships and Terms of Loans: Evidence from a Pilot Survey', *Journal of Money, Credit and Banking* 11, 349-357.
- Howorth, C., M. J. Peel and N. Wilson, 2003, 'An Examination of the Factors Associated with Bank Switching in the U.K. Small Firm Sector', *Small Business Economics* 20, 307-317.
- Jiménez, G. and J. Saurina, 2004, 'Collateral, Type of Lender and Relationship Banking as Determinants of Credit Risk', *Journal of Banking and Finance* 28, 2191-2212.
- Kim, C. S., D. Mauer and A. E. Sherman, 1998, 'The Determinants of Corporate Liquidity: Theory and Evidence', *Journal of Financial and Quantitative Analysis* 33, 335-359.
- Leeth, J. and J. Scott, 1989, 'The incidence of Secured Debt: Evidence from the Small Business Community', *Journal of Financial and Quantitative Analysis* 24, 379-393.
- Lehmann, E. and D. Neuberger, 2001, 'Do Lending Relationships Matter? Evidence from Bank Survey Data in Germany', *Journal of Economic Behavior and Organization* 45, 339-359.
- Machauer, A. and M. Weber, 1998, 'Bank Behavior Based on Internal Credit Ratings of Borrowers', *Journal of Banking and Finance* 22, 1355-1383.
- Mayer, C., 1988, 'New Issues in Corporate Finance', *European Economic Review* 32, 1167-1189.

- Mayer, C., 1994, 'The Assessment: Money and Banking: Theory and Evidence', *Oxford Review of Economic Policy* 10 (4).
- Morsman, E., 1986, 'Commercial Loan Structuring', *Journal of Commercial Bank Lending* 68, 2-40.
- Myers, C., 1977, 'Determinants of Corporate Borrowing', *Journal of Finance* 39 (3), 575-592.
- Ongena, S. and D. Smith, 2001, 'Empirical Evidence on the Duration of Bank Relationships', *Journal of Financial Economics* 61, 449-475.
- Petersen, M. and R. Rajan, 1994, 'The Benefits of Lending Relationships: Evidence from Small Business Data', *Journal of Finance* 49, 3-37.
- Petersen M. and R. Rajan, 1995, 'The Effect of Credit Market Competition on Lending Relationships', *Quarterly Journal of Economics* 110, 406-443.
- Rajan, R., 1992, 'Insiders and Outsiders: The Choice Between Informed and Arm's-Length Debt', *Journal of Finance* 47, 1367-1400.
- Ramakrishnan, R. and A. Thakor, 1984, 'Information Reliability and a Theory of Financial Intermediation', *Review of Economic Studies* 51, 415-432.
- Reig, A. and I. Ramírez, 1998, 'Efecto de la Información Asimétrica sobre el Riesgo y el Comportamiento de las Sociedades de Garantía Recíproca: Un Análisis Empírico', *Revista Española de Financiación y Contabilidad* 27, 469-497.
- Rheinbaben, J. and M. Ruckes, 2004, 'The Number and the Closeness of Bank Relationships', *Journal of Banking and Finance* 28, 1597-1615.
- Scott, J., and T. Smith, 1986, 'The Effect of the Bankruptcy Reform Act of 1978 on Small Business Loan Pricing', *Journal of Financial Economics* 16, 119-140.
- Sharpe, S., 1990, 'Asymmetric Information, Bank Lending, and Implicit Contracts: A Stylized Model of Customer Relationships', *Journal of Finance* 45, 1069-1087.

- Smith, C. and J. Warner, 1979, 'Bankruptcy, Secured Debt, and Optimal Capital Structure: Reply', *Journal of Finance* 35, 247-251.
- Stultz, R. and H. Johnson, 1985, 'An Analysis of Secured Debt', *Journal of Financial Economics* 14, 501-521.
- Swary, I. and G. Udell, 1988, 'Information Production and the Secured Line of Credit', *Working Paper*, New York University.
- Von Thadden, E., 1994, 'The Commitment of Finance, Duplicated Monitoring, and the Investment Horizon', *Working Paper*, University of Basel.
- Yosha, O., 1995, 'Information Disclosure Costs and the Choice of Financing Source', *Journal of Financial Intermediation* 4, 3-20.

**Table I**  
**Variable definition**

Name	Definition
Short-Term Bank Debt	On scale from 1 (never) to 5 (always), manager indicates frequency firm uses bank financing of < 1 year.
Long-Term bank Debt	On scale from 1 (never) to 5 (always), manager indicates frequency firm uses bank financing of > 1 year.
Concentration	Ln (1 + number of banks with which firm works)
Trust	On scale from 1 (totally disagree) to 5 (totally agree), manager gives opinion on following statement: "When granting finance, the financial institutions take their trust in the firm's managers into account".
Short Relationship	Dummy variable taking value 1 when duration of bank relationship ≤ 15 years
Cost of Debt	$\frac{\text{Financing charges}}{\text{Long - Term liabilities} + \text{Short - Term liabilities}}$
Discounts for Early Payment	Manager indicates frequency prompt payment discounts are granted to customers: "Yes, always; yes, frequently; occasionally; or never". From responses ranging from 1 to 4.
Two Relationships	Dummy variable taking value 1 when firm works with two banks and 0 otherwise
Length	LN(Number of years firm has worked with oldest bank)
Age	LN(Number of years since firm's foundation)
Financial Leverage	$\frac{\text{Long - Term Liabilities} + \text{Short - Term liabilities}}{\text{Total Assets}}$
Personal Guarantees	On scale from 1 (totally disagree) to 5 (totally agree), manager indicates opinion about following statement: "Financial institutions grant you loans and credit on the basis of personal guarantees". Dummy variable Personal Guarantees takes value 1 when response exceeds median and 0 otherwise
Collateral	On scale from 1 (totally disagree) to 5 (totally agree), manager indicates opinion about following statement: "Financial institutions grant you loans and credit on the basis of collateral". Dummy variable Collateral takes value 1 when response exceeds median and 0 otherwise.
More than Two Relationships	Dummy variable taking value 1 when firm works with > 2 banks and 0 otherwise
Lines of Credit	On scale from 1 (never) to 5 (always), manager indicates frequency firm finances itself via lines of credit.
Suppliers	On scale from 1 (never) to 5 (always), manager indicates frequency firm finances itself by postponing payment to suppliers.
Renewal	On scale from 1 (totally disagree) to 5 (totally agree), manager indicates opinion about following statement: "Your short-term debt with financial institutions (loans and credit) is renewed automatically on maturity". Dummy variable Renewal takes value 1 when response exceeds median and 0 otherwise.
Sector of Activity	Dummy variable taking value 1 when firm belongs to one of three sectors considered: Industry, Construction, Services
Solvency	$\frac{\text{Cash Flows}}{\text{Total Assets}}$
Size	LN(Net turnover)
One Relationship	Dummy variable taking value 1 when firm works with one bank and 0 otherwise

**Table II**  
**Descriptive statistics and correlation matrix**

**Panel A: Correlations**

	Short-Term Bank Debt	Long-Term Bank Debt	Concentration	Trust	Cost of Debt	Discount for Early Payment	Length	Age	Financial Leverage	Personal Guarantees	Collateral	Lines of Credit	Suppliers	Renewal	Solvency	Size
Short-Term Bank Debt																
Long-Term Bank Debt	0.0415															
Concentration	0.0682	-0.0409														
Trust	-0.0338	***0.191	-0.0178													
Cost of Debt	-0.0604	0.0465	0.0328	**0.1742												
Discount for Early Payment	0.0102	-0.0099	0.1178	0.0878	***-0.2299											
Length	0.0247	-0.0342	*0.124	0.1075	0.0623	*-0.1292										
Age	0.0723	-0.08	**0.1541	-0.0034	-0.0698	**0.1551	***0.6952									
Financial Leverage	-0.08	-0.1024	-0.0387	-0.0275	0.0251	**0.1526	***-0.3065	***-0.4455								
Personal Guarantees	0.0982	0.056	***-0.1932	-0.0614	0.1037	**0.1864	-0.0816	***-0.2513	***0.2915							
Collateral	-0.0008	**0.1812	-0.0474	**0.286	-0.0281	0.0313	-0.032	-0.0418	-0.0199	0.1116						
Lines of Credit	**0.1503	***0.2201	-0.0437	0.0277	0.1114	-0.0951	-0.0704	*-0.1341	***0.2528	***0.2414	0.0825					
Suppliers	0.0471	**0.1506	0.0701	0.021	0.0162	-0.0821	-0.0183	0.0141	*0.1263	0.0054	-0.0315	*0.1434				
Renewal	0.074	*0.1288	-0.0054	**0.1878	0.0469	-0.0643	0.0766	-0.0581	**0.1745	**0.1523	-0.0118	***0.3917	0.0529			
Solvency	-0.1218	0.0713	0.0156	**0.1483	0.0002	0.0248	0.037	0.0621	***-0.3923	***-0.2593	*0.1282	***-0.288	-0.0120	***-0.2001		
Size	0.1204	-0.0488	***0.5024	-0.0137	***-0.1992	-0.0001	*0.1304	***0.2954	-0.0944	***-0.2992	*-0.1253	-0.0405	*0.1288	-0.0094	**0.1814	

**Panel B. Descriptive statistics**

	Short-Term Bank Debt	Long-Term Bank Debt	Concentration	Trust	Cost of Debt	Discount for Early Payment	Length of Relationship	Age	Financial Leverage	Personal Guarantees	Collateral	Lines of Credit	Suppliers	Renewal	Solvency	Size
Mean	1.522	3.5549	1.1699	4.1154	0.0401	2.9121	2.6653	2.6112	0.6864	0.4286	0.2637	3.1648	2.7857	0.489	0.0813	15.4758
Standard Deviation	0.8257	1.3358	0.4356	0.9821	0.0296	0.8876	0.5778	0.5566	0.1974	0.4962	0.4419	1.5288	1.4729	0.5012	0.0528	1.045
Percentile 25	1	3	0.6931	4	0.0215	2	2.3026	2.3418	0.5607	0	0	2	1	0	0.0445	14.8792
Median	1	4	1.0986	4	0.0347	3	2.7081	2.6462	0.7222	0	0	4	3	0	0.0694	15.376
Percentile75	2	5	1.3863	5	0.0524	4	2.9957	3.0155	0.8512	1	1	5	4	1	0.1101	15.9522
Number of observation	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182	182

\*\*\*, \*\*, \*: Significant at the 1%, 5% , 10% level



**Table III**  
**Effect of trust, concentration and duration of bank relationship on debt availability**

	<b>Renewal Probit (1)</b>	<b>Renewal Probit (3)</b>
Constant	** -5.1258 (2.0078)	** -4.428 (1.8677)
<i>Firm Characteristics:</i>		
Size	0.1336 (0.1246)	0.0851 (0.1068)
Age	-0.3744 (0.3038)	-0.0395 (0.2237)
Solvency	* -3.8635 (2.2861)	-3.7104 (2.257)
Leverage	0.7021 (0.6942)	0.7455 (0.6822)
Industry	*** 0.6283 (0.2337)	*** 0.6253 (0.2306)
Construction	0.2713 (0.4196)	0.2718 (0.4163)
<i>Relationship Characteristics:</i>		
Trust	*** 0.3508 (0.1234)	*** 0.3845 (0.1225)
Concentration	-0.1335 (0.2737)	
Length	* 0.4383 (0.26)	
Short Relationship		
<i>Financing Characteristics:</i>		
Lines of Credit	*** 0.3066 (0.0723)	*** 0.3084 (0.0717)
Observation	182	182
Chi <sup>2</sup>	0	0
Pseudo R <sup>2</sup>	0.2034	0.1914

*Notes.* The dependent variable in all regressions is dummy variable Renewal. All regressions estimated using maximum likelihood. Description of all variables reported in Table I. *Observations* is number of cases included in estimation. *Chi<sup>2</sup>* is p-value of global test for significance of *Probit* model. *Pseudo R<sup>2</sup>* measures model goodness of fit. Standard errors in parentheses.

\*\*\*, \*\*, \*: Significant at the 1%, 5% , 10% level

**Table IV**  
**Effect of trust, concentration and duration of bank relationship on cost of debt**

	Cost of Debt OLS (1)	Cost of Debt OLS (2)
Constant	***0.1423 (0.0457)	***0.1694 (0.0512)
<i>Firm Characteristics:</i>		
Size	***-0.007 (0.0026)	***-0.0071 (0.0026)
Age	*-0.0092 (0.0051)	**-0.0105 (0.0051)
Solvency	*0.0553 (0.0323)	*0.0574 (0.033)
Leverage	0.0159 (0.0101)	*0.0173 (0.01)
Industry	***0.0183 (0.004)	***0.0185 (0.004)
Construction	-0.0054 (0.0057)	0.0057 (0.0056)
<i>Relationship Characteristics:</i>		
Trust	-0.0054 (0.0033)	*-0.0056 (0.0033)
Concentration	**0.0116 (.0052)	
One Relationship		**-0.0117 (0.0053)
Two Relationships		***-0.0166 (0.006)
Length	0.0095 (0.0059)	*0.0101 (0.0057)
<i>Financing Characteristics:</i>		
Discount for Early Payment	***-0.0062 (0.0022)	***-0.0066 (0.0022)
Long-Term Bank Debt	0.0017 (0.0016)	0.0016 (0.0016)
Short-Term Bank Debt	-0.0008 (0.0021)	-0.0013 (0.0022)
Suppliers	-0.0001 (0.0012)	0 (0.0012)
Observation	182	182
F	0	0
Adjusted R <sup>2</sup>	0.2734	0.2971
White	0.0685	0.0527

*Notes.* The dependent variable in all regressions is Cost of Debt. All regressions estimated using ordinary least squares. Description of all variables reported in Table I. *Observations* is number of cases included in estimation. *F* is p-value of global test of significance of linear model. *Adjusted R<sup>2</sup>* is the adjusted coefficient of determination (measures goodness of fit of linear model). *White* is p-value of White test, whose null hypothesis is absence of heteroskedasticity. When hypothesis is rejected, estimators are robust. Standard errors in parentheses.

\*\*\*, \*\*, \*: Significant at the 1%, 5% , 10% level

**Table V**  
**Effect of trust, concentration and duration of bank relationship on cost of debt in terms of duration and concentration of relationship**

	Length of Relationship		Concentration	
	≤ 15 years	> 15 years	One or two relationships	More than two relationships
	Cost of Debt OLS (1)	Cost of Debt OLS (2)	Cost of Debt OLS (3)	Cost of Debt OLS (4)
Constant	0.0774 (0.056)	***0.1839 (0.0609)	***0.1588 (0.0574)	***0.2019 (0.0626)
<i>Firm Characteristics:</i>				
Size	-0.0044 (0.0036)	***-0.0097 (0.0035)	** -0.0077 (0.0037)	** -0.0095 (0.0038)
Age	-0.0061 (0.0081)	-0.0109 (0.0088)	-0.0055 (0.0067)	*-0.0196 (0.0103)
Solvency	0.0299 (0.0657)	0.0814 (0.0653)	*0.0923 (0.0544)	0.0651 (0.0813)
Leverage	0.0315 (0.0198)	0.0038 (0.0184)	*0.0313 (0.0164)	0.0029 (0.023)
Industry	***0.023 (0.0064)	0.0101 (0.0074)	**0.0146 (0.0057)	***0.0273 (0.0087)
Construction	-0.0035 (0.0122)	0.0089 (0.0114)	0.008 (0.0097)	-0.0015 (0.0146)
<i>Relationship Characteristics:</i>				
Trust	-0.0044 (0.0033)	-0.0047 (0.003)	-0.0023 (0.0026)	** -0.0089 (0.0036)
Concentration	0.0072 (0.0072)	**0.0182 (0.0085)	-0.0096 (0.012)	0.0089 (0.0163)
Length	0.0121 (0.0093)	0.0152 (0.0115)	0.0038 (0.0058)	**0.0184 (0.0089)
<i>Financing Characteristics:</i>				
Discount for Early Payment	** -0.0078 (0.0036)	** -0.0077 (0.0036)	*** -0.0094 (0.0029)	-0.0005 (0.0049)
Long-Term Bank Debt	0.0021 (0.0021)	0.0025 (0.0024)	0.0012 (0.002)	0.0002 (0.0027)
Short-Term Bank Debt	0.0023 (0.0035)	-0.0047 (0.0037)	0.0007 (0.0032)	-0.0038 (0.0041)
Suppliers	0.0003 (0.0019)	-0.0021 (0.0023)	-0.0003 (0.0017)	0.0007 (0.0025)
Observation	99	83	108	74
F	0.001	0.0105	0.0006	0.0034
Adjusted R <sup>2</sup>	0.2147	0.1798	0.2060	0.2431
White	0.3849	0.4484	0.5795	0.4453

*Notes.* The dependent variable in all regressions is Cost of Debt. Regression (1) is estimated on sub-sample of firms with bank relationship ≤ 15 years; Regression (2) on sub-sample of firms with bank relationship > 15 years; regression (3) on sub-sample of firms working with one or two banks; Regression (4) on sub-sample of firms working with > 2 banks. All Regressions estimated using ordinary least squares. Description of all variables reported in Table I. *Observations* is number of cases included in estimation. *F* is p-value of global test of significance of linear model. *Adjusted R<sup>2</sup>* is adjusted coefficient of determination (measures goodness of fit of linear model). *White* is p-value of White test, whose null hypothesis is absence of heteroskedasticity. When hypothesis is rejected, estimators are robust. Standard errors in parentheses.

\*\*\*, \*\*, \*: Significant at the 1%, 5% , 10% level

**Table VI**  
**Effect of trust, concentration and duration of bank relationship on guarantee use**

	Personal Guarantees <i>Probit</i> (1)	Collateral <i>Probit</i> (2)	Cost of Debt <i>OLS</i> (3)	Cost of Debt <i>OLS</i> (4)
Constant	**5.4845 (2.1474)	0.5149 (2.0345)	***0.1256 (0.0379)	***0.1417 (0.0386)
<i>Firm Characteristics:</i>				
Size	***-0.4193 (0.1425)	** -0.2786 (0.1407)	** -0.0061 (0.0024)	*** -0.0069 (0.0025)
Age	* -0.525 (0.2922)	0.1671 (0.3372)	-0.0081 (0.0055)	* -0.0092 (0.0055)
Solvency	* -4.8325 (2.5329)	2.7506 (2.2811)	0.0596 (0.043)	0.0552 (0.0434)
Leverage	*1.3708 (0.6985)	0.117 (0.6992)	0.0134 (0.0128)	0.0159 (0.013)
Industry	* -0.3885 (0.2262)	-0.0924 (0.2397)	***0.0188 (0.0045)	***0.0183 (0.0046)
Construction	-0.2007 (0.4288)	-0.0786 (0.4261)	0.0051 (0.0079)	0.0048 (0.008)
<i>Relationship Characteristics:</i>				
Trust	0.1115 (0.1175)	***0.5342 (0.1533)	***-0.0058 (0.0021)	** -0.0054 (0.0022)
Concentration	-0.1855 (0.2741)	0.1973 (0.288)	**0.0125 (0.0053)	**0.0116 (0.0054)
Length	0.3687 (0.2578)	-0.2702 (0.2892)	*0.0088 (0.0048)	*0.0095 (0.0048)
<i>Financing Characteristics:</i>				
Discount for Early Payment			***-0.0068 (0.0024)	** -0.0062 (0.0024)
Long-Term Bank Debt	0.0509 (0.0844)	*0.1509 (0.0882)	0.0017 (0.0015)	0.0016 (0.0015)
Short-Term Bank Debt	**0.2571 (0.1261)	0.0699 (0.1322)	-0.0014 (0.0025)	-0.0008 (0.0025)
Suppliers			-0.0003 (0.0014)	-0.0001 (0.0014)
Personal Guarantees			*0.0026 (0.0014)	
Collateral				0.0001 (0.0013)
Observations	182	182	182	182
Chi <sup>2</sup>	0	0.0027		
Pseudo R <sup>2</sup>	0.2050	0.1358		
F			0	0
Adjusted R <sup>2</sup>			0.2283	0.2125
White			0.1248	0.1147

*Notes.* The dependent variable is the dummy variable Personal Guarantees in Regression (1), the dummy variable Collateral in Regression (2) and the variable Cost of Debt in Regressions (3) and (4). Estimates made using maximum likelihood in Regressions (1) and (2), and ordinary least squares in Regressions (3) and (4). Explanatory variables Personal Guarantees and Collateral in Regressions (3) and (4) respectively, are scales. Description of all variables reported in Table I. *Observations* is the number of cases included in estimation. *Chi<sup>2</sup>* is p-value of global test for significance of *Probit* model. *Pseudo R<sup>2</sup>* is model goodness of fit. *F* is p-value of global test of significance of linear model. *Adjusted R<sup>2</sup>* is adjusted coefficient of determination (measures goodness of fit of linear model). *White* is p-value of White test, whose null hypothesis is absence of heteroskedasticity. When hypothesis is rejected, estimators are robust. Standard errors in parentheses.

\*\*\*, \*\*, \*: Significant at the 1%, 5% , 10% level

**Appendix 1****Relationship lending empirical evidence**

Country	Authors	Relationship indicator	Results		
			Availability	Interest rate	Guarantees
USA	Petersen and Rajan (1994)	Length	Increase	No effect	
		Concentration	Increase	Decrease	
	Berger and Udell (1995) Cole (1998)	Length	Increase	Decrease	Decrease
Germany	Horhoff and Korting (1998)	Length	No effect	No effect	Decrease
		Concentration	Increase	No effect	Decrease
	Machauer and Weber (1998)	Length	No effect	No effect	No effect
		Concentration	Increase	No effect	Increase
	Elsas and Krahen (1998)	Length		No effect	
Lehmann and Neuberger (2001)	Length	Increase	No effect	Decrease	
Italy	Angelini <i>et al.</i> (1998)	Trust	Increase	Decrease	No effect
		Concentration	Increase	Increase	
Belgium	Degryse and Van Cayseele (2000)	Length		Increase	Decrease
		Concentration	Increase		
	De Bodt <i>et al.</i> (2005)	Length	Increase		
		Concentration	Increase		

Source: Prepared by the authors

**Appendix 2****Firm characteristics and borrowing concentration**

Variables	Means of variables by number of bank relationships			F-test	p-value
	1	2	>2		
Turnover (m. euros)	4591.8	5273.2	20800.8	6.77	0.0015
Age	14.798	13.471	17.847	4.52	0.0122
Working capital	0.0787	0.0709	0.1133	0.89	0.4115
Cash-flow	0.0757	0.0851	0.0838	0.54	0.5812
Profitability	0.0761	0.0785	0.0784	0.02	0.9781
Indebtedness	0.8234	0.508	0.7089	0.66	0.5159
Number observations	63	45	74		

Note: The F-statistic tests the equality of the mean values