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# Does Relationship Banking Have Value for Small Firms?

## ABSTRACT

*This study examines empirically the effect of bank-borrower relationships on the availability and cost of funds in a sample of small and medium sized Finnish firms. The results suggest that that the smaller firms with long-term relationships borrow with lower interest rates and that collateral requirements are higher for firms with multiple relationships. At the same time the main banks of our sample firms charge them higher than market interest rates.*

## 1. INTRODUCTION

The Finnish banking sector has experienced significant changes during the recession in the beginning of the 1990s and in the subsequent years. The largest among these were the disappearance of most Savings and Loans, the merger of the *Kansallis-Group* to the *Union Bank of Finland*, and the appearance of new, mostly foreign, banks to compete with the remaining ones. As financial markets are becoming increasingly competitive, both internationally and locally, bank-borrower relationships and their role in corporate lending have received a lot of attention in the literature. The aim of this study is to examine the effect of bank-borrower rela-

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tionships on the availability and cost of funds in a sample of small and medium-sized Finnish firms.

Empirical evidence suggests that bank loans are the most important source of external funds in most developed financial markets. Mayer (1988) investigates the net financing of private physical investments by enterprises in France, Germany, Japan, the UK, and the US during 1970–1985. He finds that while investments are for the most part self-financed (with retentions), bank loans are by far a more important financing source than trade credit, bonds or outside equity. The issue of whether relationship lending has value for a given firm is therefore by no means minor, because it affects most firms in any financial market.

Existing theory suggests that financial intermediation has developed as a response to costly market imperfections such as information asymmetries, because banks have a comparative advantage over securities markets in screening and monitoring corporate clients. Much of the work in this area follows from Campbell (1976), who argues that it can be efficient for a firm to deal with a financial intermediary and make this intermediary a quasi insider. More formal models in this area have been developed by Diamond (1984), Ramakrishnan and Thakor (1984), and Boyd and Prescott (1986). While it has since become widely accepted in the literature that an on-going relationship between the lender and the borrower lowers precontract information costs, it is less clear whether these benefits are passed on to the borrowers.

Mayer (1988), Petersen and Rajan (1994), and Boot and Thakor (1994) suggest that a firm with close ties to financial institutions should have a lower cost of capital and better access to funds relative to firms without such ties. A number of empirical studies support the above argument that relationship lending has value. Petersen and Rajan (1994), Berger and Udell (1995), Blackwell and Winters (1997), and Harhoff and Körting (1998) find that the existence of a relationship lowers the price of credit, and that attempts to widen the circle of relationships by borrowing from multiple lenders increases the price and collateral requirements and reduces the availability of credit.

On the other hand, Greenbaum et al. (1989), Sharpe (1990), and Rajan (1992) argue that it is entirely possible that the lender is not compelled by market forces to pass on the benefits to the borrowers via, e.g., a lower interest rate. For example, if the relationship per se confers a monopoly on the lender, this is what could be expected. These ideas, too, get support in the empirical literature. Houston and James (1997) find that information monopolies associated with borrowing from a single bank limit the use of bank debt. Weinstein and Yafeh (1998) find that when access to capital markets is limited, close bank-borrower relationships increase the availability of capital to borrowing firms (see also Hoshi et al. 1990). Also, the cost of capital of main bank clients is higher than that of their peers. Weinstein and Yafeh (1998) further suggest that the benefits of close relationships accrue mostly to the main bank, which is able

to capture most of the rents through high interest payments and through pressure on clients to use large quantities of bank financed capital inputs.

Relationship lending has not been examined on Finnish data in detail before. Niskanen (1999) concentrates on the effects of bank ownership of corporate equity on loan availability, loan pricing, and collateral requirements, and also provides some evidence on relationship lending issues. This study goes on to investigate relationship lending issues with a set of more detailed variables. Another difference is that we focus on small firms whereas Niskanen (1999) used a sample of listed firms.

Our results suggest that relationship lending has value in that firms with fewer and longer relationships have better access to funds. We also find that smaller firms with long-term relationships borrow with lower interest rates, and that collateral requirements are higher for firms with multiple relationships. At the same time the main banks of our sample firms exhibit to some extent monopolistic behavior in that they charge higher interest rates than outside credit sources do.

The study proceeds as follows. Section 2 presents the data and summarizes the hypotheses. The availability of funds and the terms of credit are empirically examined in sections 3, 4, and 5. Section 6 provides a summary.

## 2. DATA AND RELATIONSHIP VARIABLES

### 2.1 Data

The data for this study were collected through a private survey which targeted *all* except small service industry firms (net sales below 1 million FIM; 1 Euro ~ 6 FIM) operating in the Pirkanmaa region surrounding the city of Tampere. The questionnaire was mailed to 5858 firms, whereof 526 (9 percent) replied. In the questionnaire, we did not ask the respondent company's name, because the information they were asked to provide was highly confidential, and we believe that private firms are in general reluctant to give financial information to outside parties.

Table 1 presents the distribution of the sample firms by firm size and industry compared to the entire population of firms in the Pirkanmaa region. Panel A shows that as many as 78 percent of sample companies have sales below 10 million FIM (1 Euro ~ 6 FIM), which by most classifications groups them as small companies. Even if the number of large companies is relatively small when the number of firms is considered, the 14 largest companies represent 64 percent of the combined aggregate sales in the sample (in 1996). Compared to the entire population of firms operating in Pirkanmaa, the share of very small firms (sales below 1 million FIM) in our sample is much smaller (19 vs. 74 percent). This may be largely explained by the exclusion of small service firms from the survey.

**TABLE 1. Sample distribution by firm size and industry**

<b>Panel A: Sample distribution by firm size</b>	
<b>Sales</b>	<b>Sample distribution (distribution of firms in the Pirkanmaa region in parentheses)</b>
<b>Below 1 million FIM</b>	<b>19 % (74 %)</b>
<b>1–2 million</b>	<b>21 % (11 %)</b>
<b>2–5 million</b>	<b>25 % (8 %)</b>
<b>5–10 million</b>	<b>13 % (4 %)</b>
<b>10–50 million</b>	<b>16 % (3 %)</b>
<b>Above 50 million</b>	<b>6 % (1 %)</b>
<b>Panel B: Sample distribution by industry</b>	
<b>Industry</b>	<b>Sample distribution (distribution of firms in the Pirkanmaa region in parentheses)</b>
<b>Manufacturing</b>	<b>34 % (18 %)</b>
<b>Retail and Wholesale</b>	<b>27 % (27 %)</b>
<b>Real estate services</b>	<b>16 % (23 %)</b>
<b>Construction</b>	<b>11 % (14 %)</b>
<b>Transport</b>	<b>4 % (10 %)</b>
<b>Public utilities</b>	<b>3 % (1 %)</b>
<b>Accommodation</b>	<b>2 % (5 %)</b>
<b>Other</b>	<b>2 % (3 %)</b>

Panel B presents the distribution of sample firms by industry. The manufacturing firms form the largest industry in the sample with 34 percent, followed by the firms in the retail and wholesale industry with 27 percent. While the real estate industry is re-presented with 16 percent and the construction industry with 11 percent, the other industries represent all fairly small shares of the total. At least partly due to the selection of the target group of the survey, manufacturing firms are over-represented in the sample compared to the entire population of firms in the Pirkanmaa region (34 vs. 18 percent), but in other industries there are not very large absolute differences in the percentages. For instance, the relative frequencies of retail and wholesale firms are exactly the same in our sample and in the entire firm population.

In the questionnaire, the firms were asked to provide information for the period 1994–1997 in the following areas relevant to this study<sup>1</sup>:

<sup>1</sup> The questionnaire also contained questions on corporate ownership structure, loan restructuring and loan covenants.

1. Corporate specific background information such as industry, age and number of employees.
2. Main bank relationship.
3. Number of lending banks.
4. Corporate financial characteristics.
5. Investments.
6. Detailed information on loans taken by the firm during 1994–1997.

The final sample consists of data on 526 companies, and the total number of observations is 1664. Average loan size is 1.29 million and average maturity is 5.3 years. Floating rate loans dominate the sample with 82 percent, and the most important reference rate was the 3 month Helibor (Helsinki Interbank Offered Rate) with 34 percent followed by 6 month Helibor with 24 percent and bank specific prime rates with 10 percent. The average interest rate on all loans in the sample is 6.51 percent, and the average margin is 1.55 percent. Only six loans are foreign currency denominated.

Table 2 presents descriptive statistics on some key variables. Based on the figures for the whole sample in panel A, we can see that while the levels of average operating margin, profit margin and quick ratio are quite acceptable, their range is very wide. The excessively high maximum quick ratios are observed because some (small in particular) firms may hold cash, inventories and accounts receivable, and at the same they hold almost non-existent levels of current liabilities.

The average length of the bank-borrower relationship is 11.9 years, which is not much lower than the average firm age of 15.9 years. This suggests that bank changes are not very common. The firms borrow on average from 0.85 banks, but some firms use as many as seven banks. And finally, the average county in the Pirkanmaa region has five banks, with a range of one to seven banks.<sup>2</sup>

Panel B breaks up the sample into two subsamples based on our measure of loan availability and presents descriptive statistics for the two subsamples. Because it is difficult to measure loan availability directly, we use the firms' ability to realize profitable investment projects as an indirect measure. As could be expected, there are differences in the financial characteristics between firms that have given up profitable investment opportunities and those that have not. The firms in the former group appear to be less profitable, less liquid, and more levered. Also, it seems that these firms are younger, have shorter bank-borrower relationships, and borrow from more banks.

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<sup>2</sup> The loan observations were distributed between municipalities in Pirkanmaa with different numbers of banks as follows: zero banks 0.4%, one bank 0.9%, two banks 1.9%, three banks 14.1%, four banks 25.8%, five banks 10.7%, 6 banks 29.3%, and seven banks 16.5%.

TABLE 2. Summary statistics

Panel A: Descriptive statistics for the whole sample				
	Mean	Standard deviation	Minimum	Maximum
Operating margin	0.39	1.61	-1.83	46.8
Profit margin	0.07	0.13	-1.66	1.03
Quick ratio	4.08	34.88	0.00	868.70
Debt to total assets	0.73	1.75	0.00	51.40
Length of longest relationship	11.9	14.3	1.00	127.00
Number of lending banks	0.85	0.87	0.00	7.00
Number of banks in the county	4.99	1.50	1.00	10.00
Firm age	15.9	16.9	1.00	127.00
Panel B: Descriptive statistics for firms that have/have not given up profitable investment opportunities				
	Has given up profitable investment opportunities		Has not given up profitable investment opportunities	
	Mean	Standard deviation	Mean	Standard deviation
Operating margin	0.28	0.47	0.41	1.77
Profit margin	0.04	0.11	0.07	0.13
Quick ratio	1.92	4.53	4.59	38.72
Debt to total assets	0.86	1.07	0.69	1.87
Length of longest relationship	10.09	10.41	12.34	15.15
Number of lending banks	1.09	0.89	0.79	0.86
Number of banks in the county	4.87	1.45	5.02	1.52
Firm age	15.61	15.57	16.02	17.23
Panel C: Distribution of interest rate margins ranked according to selected firm and relationship characteristics				
	1st quartile (lowest)	2nd quartile	3rd quartile	4th quartile (highest)
Operating margin	1.44	1.28	1.66	2.01
Profit margin	1.64	1.30	1.37	2.08
Quick ratio	1.45	1.73	1.18	1.87
Debt to total assets	1.40	1.21	1.55	1.77
Length of longest relationship	1.72	1.33	1.87	1.30
Number of lending banks	1.39	1.97	1.88	0.97
Number of banks in the county	1.90	1.45	1.32	1.58
Firm age	1.72	1.68	1.64	1.16
Panel D: Share of collateralized loans ranked according to selected firm and relationship characteristics				
	1st quartile (lowest)	2nd quartile	3rd quartile	4th quartile (highest)
Operating margin	85.7	89.9	95.7	90.7
Profit margin	86.0	93.2	92.9	91.1
Quick ratio	90.8	87.9	95.5	87.2
Debt to total assets	90.0	94.5	87.6	88.9
Length of longest relationship	94.0	88.1	93.6	90.3
Number of lending banks	84.8	97.9	91.7	91.3
Number of banks in the county	96.7	90.3	95.8	82.8
Firm age	94.6	91.4	94.7	85.1

Panel C shows the distribution of loan interest rate margins by firm characteristic and relationship characteristic quartiles. The results are not straight forward for all variables. For example, we can see that the most profitable firms pay the highest interest rate margins, and the same is the case for the most liquid firms. The result for these variables suggest that their relationship with interest rate margins is not linear.

The results for leverage are quite intuitive. They suggest that the most levered firms pay the highest interest rates. The connection between loan margin and relationship length, too, seems to be nonlinear. It seems that the firms in the 2nd and 4th quartile have the lowest margins. As far as the number of lending banks is concerned, it seems that the firms, which borrow either from only few banks or from a multitude of banks have the lowest interest rate margins. Finally, it seems that the firms in the least competitive markets pay the highest interest rates, and so do the youngest firms.

Panel D presents the share of collateralized loans by firm characteristic and relationship characteristic quartiles. The results suggest that the least profitable firms are the least likely to pledge collateral, but the results for liquidity and leverage are less clear. Relationship length seems to reduce collateral requirements initially, but this effect is reversed later on. The oldest firms and the firms that borrow from the fewest banks are the least likely to pledge collateral. Finally, the firms operating in the most concentrated markets are the most likely to pledge collateral.

## 2.2 Relationship Variables

We use three different measures for the closeness of the bank-borrower relationship. The first one is the number of banks the firm borrows from, that is, borrowing concentration. Petersen and Rajan (1994, 1995) suggest that borrowing concentration increases loan availability and reduces borrowing costs, while Boot and Thakor (1999) suggest that borrowing concentration reduces collateral requirements.

The second relationship variable we use is the length of the relationship with the borrowing firm and its main bank. E.g., Petersen and Rajan (1994, 1995) and Berger and Udell (1995) suggest that this variable can be used as a measure of the private information that the institution has about the borrower. It can therefore be argued that firms with longer relationships have better access to funds and face lower interest rates and collateral requirements.

Our third relationship measure is a dummy, which takes the value of one if the loan has been taken from the firm's main bank. The expectations on this variable are mixed. A number of studies, e.g., Petersen and Rajan (1994, 1995) and Berger and Udell (1995), suggest that firms benefit from borrowing concentration in terms of easier access to funds and lower borrowing costs. Others, including Weinstein and Yafeh (1998), show that even if main

bank clients have easier access to funds, these banks charge them higher than market interest rates.

### 3. AVAILABILITY OF FUNDS

Hitherto the literature on loan availability at the corporate level has not been able to develop direct methods to measure whether a firm is capital rationed by financiers. In this study, we test two alternative indirect measures. First, we measure loan availability by the firm's ability to realize profitable investment projects. As far as we know, this variable has not been previously tested. In the survey questionnaire, we asked the firms if they had been forced to reject investment proposals during the research period. If this was the case, we concluded that the firm in question was capital rationed by the banks from which it tried to obtain funding. Thus, our measure of loan availability is a (0,1) variable getting the value one if the firm has been forced to reject profitable investment opportunities, and zero otherwise. It appears that about 20 percent of the sample firms were subject to capital rationing during the sample period. Column I of Table 3 presents the results from estimating a logit model where loan (un)availability was regressed on the number of lending banks a firm has and, the length of the banking relationship with its main bank and a set of control variables.

The results in Table 3, column I, indicate that a close banking relationship improves loan availability. The coefficient on the number of lending banks is positive and statistically significant, indicating that firms borrowing from multiple banks are financially more constrained than firms with a close relationship. The coefficient on the length of the bank-borrower relationship is significantly negative indicating that firms with long relationships have easier access to bank loans.

All firm-specific control variables are significant determinants of loan availability. The negative coefficient on firm size indicates that larger firms are less likely to be financially constrained by banks. However, we find that old firms – which more often also tend to be large firms – have less easy access to funds than younger firms. This result is somewhat unexpected since it implies that firm age does not serve as an indicator of creditworthiness as suggested in, e.g., Diamond, 1991. Collinearity should not be the primary reason for this result since the correlation between firm size (sales) and firm age is only 0.27. The results further show that the more profitable and liquid the firm is, the smaller is the probability of becoming financially constrained. Respectively, high leverage decreases loan availability.

Recently, increasing attention has been paid to the degree of interbank competition, and its impact on relationship lending issues. Boot and Thakor (1999) present a model, which suggests that increased competition in banking will in fact accentuate the importance of close



**TABLE 3. Loan availability**

*Column I:* Results from estimating a logit-model, where the likelihood to forego profitable investment opportunities is explained by the competitiveness of the banking sector, relationship variables, firm- and loan-specific variables.

*Column II:* Respective results from an Ordinary Least Squares (OLS) regression, where the dependent variable is accounts payable scaled by total assets.

<i>Independent variable</i>	<b>Column I: Logit model (N = 919)</b>		<b>Column II: OLS model (N = 910)</b>	
	<b>Coefficient</b>	<b>p-value</b>	<b>Coefficient</b>	<b>p-value</b>
<i>Relationship variables</i>				
Number of lending banks	.252	.008	-.016	.002
Relationship length	-.494	.000	.009	.212
<i>Firm characteristics</i>				
Sales	-.253	.000	.013	.000
Age	.788	.000	-.039	.000
Operating margin	-.977	.000	-.046	.000
Quick ratio	-.361	.044	-.035	.000
Leverage	.843	.000	.043	.000
<i>Industry dummies</i>				
Manufacturing	1.377	.000	.010	.362
Retail and wholesale	.891	.000	.124	.000
<i>Bank concentration</i>				
Number of banks in the county	-.0003	.996	.005	.095
Constant	-1.582	.010	.085	.007
Pseudo-R <sup>2</sup> (Col. I) / Adjusted R <sup>2</sup> (Col. II)	.128		.221	
χ <sup>2</sup> (Col. I) / F-value (Col. II)	120.36	.000	26.835	.000

Pseudo-R<sup>2</sup> is computed as  $1 - \ln L(\Omega) / \ln L(\omega)$ , where  $\ln L(\Omega)$  is the value of the likelihood-function evaluated at the maximum likelihood estimates and  $\ln L(\omega)$  is the maximum value of the likelihood function under the hypothesis that all independent variables equal zero.

relationships. Empirical evidence in Petersen and Rajan (1995) and Harhoff and Körting (1998) suggests that firms operating in areas with concentrated banking markets have lower borrowing costs and lower loan availability as opposed to firms operating in competitive markets. As an attempt to control for the potential effects of interbank competition on relationship lending issues, we include the number of banks operating in the county where the firm is located in our regression. Hannan (1991) justifies this measure by showing that the market for bank com-

mercial loans is local in nature. However, the results concerning this variable should be interpreted carefully since we cannot document that this would be the case in the Pirkanmaa region, too. Table 3, column I, shows that the coefficient on interbank competition is statistically insignificant. This result is in line with arguments in the relationship lending literature suggesting that increasing interbank competition does not benefit the corporate sector (see, e.g., Sharpe, 1990).

In column II of Table 3, we present the results of a parallel test where the accounts payable to total assets ratio is (Ordinary Least Squares) regressed on the same explanatory variables that appear in column I. This indirect measure for loan availability has previously been used in Petersen and Rajan (1994) and Niskanen (1999). The rationale for this approach is that trade credit is taken only if the firm is capital rationed by financial institutions, and larger than average accounts payable thus indicate restricted access to institutionalized capital markets.

The results concerning the relationship variables are exactly the opposite to those reported in column I of Table 3, i.e. against the prediction that close bank-borrower relationships enhance loan availability. However, the relationship length variable is not statistically significant.

In column II of Table 3, the signs of the firm-specific control variables are in line with theoretical arguments and prior empirical research. Larger firms have been documented to hold higher levels of accounts payable (Petersen and Rajan, 1997; Niskanen and Niskanen, 1999). There is also evidence that older firms would use less trade credit than smaller and younger firms because of relatively smaller investment opportunities (Petersen and Rajan, 1997, 684). Profitable firms with larger operating margins have better internal financing and are thus less likely to use large amounts of trade credit as it is well known to be an expensive form of financing. The coefficient of bank concentration is positive and statistically significant ( $p=0.095$ ) indicating that an increase in the number of competing banks increases trade credit usage.

The controversial results concerning loan availability are puzzling. Since the independent variables in both regressions in Table 3 are the same, one easily turns to compare the validity of the dependent variables as measures for loan availability in the first phase. The dependent variable in column I of Table 3 can be criticized because it is a subjective evaluation on whether the firm has been forced to reject profitable investment opportunities during the study period. It can be argued that that even if the firm thinks that its potential investment project is profitable, the lender bank does not necessarily share this view. Furthermore, there may be firms that have answered yes to the question of whether they have been forced to reject profitable investment opportunities due to some other reason than loan unavailability. For instance, firms that are highly levered may reject even profitable new projects because they don't want to increase their risk by taking additional debt. Finally, it may be argued that the question that was asked in the questionnaire ignores the interfirm variation in the serious-

ness of loan unavailability, because it is not phrased on a scale, but only alternatives "yes" and "no" are possible.

The regression model in column II with trade credit as the dependent variable is problematic for several reasons. Some of the reasons are related to the variable itself, and others to the set of explanatory variables used in the model.

First, while Petersen and Rajan (1994) and Harhoff and Körting (1998) use trade credit as a measure for the availability of funding from financial institutions, it can be argued that a large fraction of firms most probably use trade credit as an integral part of their short-term financial policy rather than as a substitute for the lack of long-term funding,

Second, the theoretical predictions for the signs of the coefficients of the relationship variables in column II of Table 3 are not straightforward. Petersen and Rajan (1994) and Harhoff and Körting (1998) suggest that the demand for trade credit should decrease with the strength and length of relationships with financial institutions if trade credit is seen as a substitute for the lack of funding from financial institutions. Petersen and Rajan (1997) conversely suggest that trade credit supply should increase with the strength of relationships with financial institutions, because such relationships serve as a measure of the firm's reputation in the debt market. Empirically, Petersen and Rajan (1997) find no association between the level of trade credit used and lending relationship variables.

Finally, our data do not allow us to use a measure for the supply side of trade credit in column II of Table 3, and the regression coefficients thus are reduced form coefficients including both demand and supply. Petersen and Rajan (1997) who point out this problem are able to use estimates of their sample firms' annual purchases that are made on credit as a variable supposed to capture the supply side of trade credit.

As a conclusion, it remains uncertain whether banking relationships do affect loan availability, and if they do, what is the direction of the effect. We believe that the results presented in column I of Table 3 are closer to reality because we consider the potential deficiencies both in the dependent and independent variables less serious than in the model based on trade credit usage. However, we think that theoretical work is needed to develop more valid measures for loan availability at the level of individual firms.

#### 4. COST OF FUNDS

Table 4 presents Ordinary Least Squares results from regressing the firms' borrowing costs on the relationship variables. We use both the interest margin and the total interest rate as dependent variables. While the results are qualitatively similar for the two dependent variables, we present only the results for the interest rate margin.

**TABLE 4. Corporate borrowing costs**

Results from regressing the interest rate margin with the competitiveness of the banking sector, relationship variables, firm- and loan-specific variables and time

<i>Independent variable</i>	Column I (N=212)		Column II (N=212)	
	Coefficient	p-value	Coefficient	p-value
<i>Relationship variables</i>				
Number of lending banks	-.055	.619	-.104	.401
Relationship length	.189	.141	.384	.016
Loan from main bank (0,1)	.610	.003	.737	.010
<i>Firm characteristics</i>				
Sales	-.229	.000		
Firm size(=1, if sales below median)			1.999	.026
Age	.038	.798	.006	.967
Operating margin	-.789	.019	-.684	.046
Quick ratio	-.021	.902	-.017	.921
Leverage	.337	.046	.372	.028
<i>Loan specific variables and market rate</i>				
Maturity	-.147	.000	-.153	.000
Collateral (0,1)	.350	.319	.467	.187
Floating rate loan (0,1)	1.747	.000	1.750	.000
Market rate	-.091	.281	-.087	.312
<i>Industry dummies</i>				
Manufacturing	-.005	.982	-.053	.812
Retail and wholesale	-.276	.250	-.225	.356
<i>Year dummies</i>				
1997	.375	.258	.393	.242
1996	-.261	.237	-.167	.457
1995	-.159	.578	-.155	.594
<i>Multiplicative dummies</i>				
Number of banks in the county 5 Firm size			-.075	.555
Number of lending banks 5 Firm size			-.090	.702
Relationship length 5 Firm size			-.398	.064
loan from main bank 5 Firm size			-.331	.398
<i>Bank concentration</i>				
Number of banks in the county	-.046	.457	-.063	.485
Constant	2.480	.012	-.169	.858
Adjusted R <sup>2</sup>	.415	.000	.404	.000

Out of the three relationship variables, the dummy indicating whether the loan has been taken from the company's main bank is significant with a positive coefficient value. That is, when the loan is from the main bank, the firm must pay a higher margin than in the case when the lender is some other financial institution. This result is well in line with the theoretical arguments in Greenbaum et al. (1989), who suggest that the bank benefits when the borrowing firms are in a sense informationally captured because of asymmetric evolution of information on firm quality.

At first sight (column I in Table 4), it seems that the length of the bank-borrower relationship is not a significant determinant of corporate borrowing costs. We refine the analysis concerning this variable to take into account the possibility that relationships are more important for smaller firms than for larger firms. It has been hypothesized in the relationship lending literature that information asymmetries are more severe for smaller firms (e.g., Berger and Udell, 1995). We first reformulate the sales variable so that it obtains the value of 1 if the company's sales are below sample median, and zero otherwise. Furthermore, we add cross products of the new dummy and the variables describing bank competition, and the sample firms' banking relationships into the model.

The results in column II, Table 4, indicate that the length of the bank-borrower relationship now becomes significant. The result can be broken down into two parts. First, in the whole sample, the coefficient on the length of the bank-borrower relationship is statistically significant and positive. That is, the longer the relationship, the higher the margin paid by the borrowing firm. However, the cross product between the length of the relationship and the firm size dummy has a negative sign ( $p=0.064$ ). This, in turn, indicates that for small firms the lengthening of a banking relationship lowers interest rate margins and thus improves credit terms. This result is well in line with theoretical arguments on the role of bank-borrower relationships, and with a notion that smaller firms with few other options benefit from close relationships, whereas larger firms that for some reason borrow from banks face higher interest rates than they would if they used direct market sources.

All firm-specific control variables, except firm age, are statistically significant and have the expected signs. As for the loan-specific variables, loan maturity and the floating rate dummy are statistically significant. The negative sign on loan maturity indicates that the shorter the maturity, the larger the interest rate margin. Smith (1980) provides a discussion on the indeterminacy of this variable. He claims that loan maturity has two possible effects on loan rates either of which can dominate. On one hand, an increase in the time to repayment reduces the current value of debt increasing the promised interest rate. On the other hand, given the current value of the debt and promised repayment, an increase in loan maturity lowers the promised interest rate (because the number of interest rate payments goes up).

The positive coefficient on the floating rate loan dummy indicates that floating rate loans have higher margins than fixed rate loans. (For fixed rate loans, a computational margin was determined by deducting the required return on government bonds having the closest term to maturity). This result is consistent with the theoretical notion in Berger and Udell (1990) according to which banks perceive floating rate loans more risky because of fluctuating debt service requirements.

Collateral requirements do not have a statistically significant effect on the interest rate margin, i.e. interest and collateral are not substitutes. This is well in line with the theoretical arguments in Fried and Howitt (1980). Rather, the positive sign of the collateral dummy may indicate that when collateral is pledged, the interest rate required for a loan is higher. While it can be easily accepted that higher risk implies a higher required rate of return, this result lends some support to the theoretical arguments in Bester (1985), Besanko and Thakor (1987) and Chan and Thakor (1987), who suggest that the level of collateral should be positively correlated with the riskiness of the borrowers investment projects. To shed further light on this issue, we compare the mean interest rates between loans with and without collateral. It appears that in the group of loans for which collateral was pledged, both the interest rate margin and total interest rate were higher (1.67 percent vs. 0.15 percent and 6.62 percent vs. 5.31 percent, respectively ( $p < 0.01$ )).

Unlike in the regression concerning loan availability, the firm's industry is not related to the interest rate margin. The year-dummies, too, are insignificant explanatory variables for borrowing costs, indicating no changes in this aspect during the period 1994–97. Again, this is somewhat surprising considering the improvement in the overall economic conditions during the time period, not to forget the common perception presented in the press that increased competition in the banking sector has had a significant impact on corporate borrowing costs.

An increase in the number of banks operating locally does not explain the determination of borrowing costs. As could be expected, banks do not seem to be willing to compete with each other by reducing interest rates, even when the number of banks operating locally increases.

## 5. COLLATERAL REQUIREMENTS

While a large fraction of corporate loans are secured, empirical studies on the role of collateral are few in number. In our sample, collateral is pledged in approximately 90 percent of the cases. The results from a logit model with a collateral dummy (= 1 if collateral pledged, = 0 otherwise) as the dependent variable are presented in Table 5.

**TABLE 5. Determinants of collateral being pledged**

Results from estimating a logit-model, where the likelihood to pledge collateral is explained by the competitiveness of the banking sector, relationship variables, firm- and loan-specific variables as well as time.

Dependent variable: Collateralized loan dummy (N=210)		
<i>Independent variable</i>	Coefficient	p-value
<i>Relationship variables</i>		
Number of lending banks	.788	.070
Relationship length	.058	.902
Loan from main bank (0,1)	.972	.240
<i>Firm characteristics</i>		
Sales	-.575	.045
Firm age	-.311	.627
Operating margin	.053	.973
Quick ratio	-.395	.415
Leverage	.207	.893
<i>Loan specific variables and market interest rate</i>		
Maturity	-.135	.215
Floating rate loan (0,1)	3.267	.009
Market interest rate	.343	.305
<i>Industry dummies</i>		
Manufacturing	-2.957	.015
Retail and wholesale	-2.103	.132
<i>Year dummies</i>		
1997	-.551	.690
1996	-.208	.787
1995	.572	.655
<i>Bank concentration</i>		
Number of banks in the county	-.506	.052
Constant	8.634	.037
Pseudo-R <sup>2</sup>	.427	
$\chi^2$	55.973	.000

As for the relationship variables, only the number of banks used by the firm seems to be significant ( $p=0.070$ ). The negative sign on this variable indicates that collateral is required more often if the firm borrows from multiple banks. The result is in line with Boot and Thakor (1994) and intuitively appealing because it can be easily accepted that a bank will be more inclined to require collateral to secure its own position if it is likely that the firm will borrow from other sources as well.

From the firm-specific variables, only firm size is a significant determinant of collateral requirements. The result indicates that larger firms pledge less collateral, probably because of smaller information asymmetries associated with larger firms as opposed to smaller firms. Among the loan-specific variables, the floating rate loan dummy is statistically significant and positive, indicating that banks require more collateral for floating rate loans. The industry dummies take statistically significant negative coefficients indicating that manufacturing and commercial firms do not pledge collateral as often as do firms from other industries. The year dummies are again all insignificant.

Table 5 shows that bank concentration is a significant determinant of collateral requirements ( $p=0.052$ ). The number of local banks competing has a negative sign thus indicating that firms benefit from increasing competition between banks. The reason for the fact that bank competition has an impact on collateral requirements but not on loan availability or borrowing costs remains uncertain. One possible explanation could be that while banks may be unwilling to attract other banks' clients by increasing availability of funds or reducing prices, they may be willing to increase loan availability to their own clients by reducing collateral requirements.

## 6. SUMMARY AND CONCLUSION

The aim of this study is to examine the effect of bank-borrower relationships on the availability and credit terms of corporate bank loans. The sample covered the data on 526 Finnish firms located in the Pirkanmaa region surrounding the city of Tampere from a four-year period 1994–1997. The results are summarized in Table 6 below.

The results are inconclusive on whether firms with fewer and longer relationships have better access to funds. On the other hand, the results show that smaller firms with long-term relationships borrow with lower interest rates, and that collateral requirements are higher for firms with multiple relationships. At the same time the main banks of our sample firms exhibit to some extent monopolistic behavior in that they charge higher interest rates than outside credit sources do. ■



TABLE 6. Summary of empirical findings

Independent variable	Loan availability	Credit terms	
		Interest rate margin	Collateral requirements
Nature of bank-borrower relationship	?	Main bank charges higher margins than other banks.  Relationship length reduces borrowing costs for the below median sized firms, but increases borrowing costs for the above median sized firms.	Firms borrowing from multiple banks face higher collateral requirements.
Firm size	Large size improves loan availability.	Large size decreases loan interest margins.	Large firms are less likely to pledge collateral.
Corporate financial characteristics	Good financial condition improves loan availability.	Good financial condition decreases interest margins paid.	Corporate financial characteristics have no impact on collateral requirements.
Loan characteristics	Not available.	Loans with longer maturities have lower margins. Collateral has no impact on loan pricing.	Collateral is pledged more often with floating rate loans than with fixed rate loans.
Industry	Manufacturing, retail and wholesale industries are worse off than firms in the other industries.	Industry has no impact on interest margin.	Manufacturing, retail and wholesale industries face lower collateral requirements.
Bank concentration (interbank competition)	Increased bank competition may decrease loan availability.	Degree of bank competition does not have an impact on interest rate margins.	An increase in bank competition decreases collateral requirements.

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