THE RELATIONSHIPS BETWEEN FIRMS AND BANKS: CHOOSING BETWEEN SINGLE AND MULTIPLE BANK RELATIONSHIPS

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There is evidence that firms borrow for the first time from a single bank, but soon afterwards some of them start borrowing from two or more banks simultaneously. Our results suggest that firms explore the advantages of an exclusive relationship with one bank, but also take into account that the resulting information monopoly of the single informed bank may result in income losses to firms.

1. INTRODUCTION

Most firms depend greatly on their self-financing capacity to finance investment projects. When firms need to resort to external funding sources, most of them choose bank lending and only a few opt for issuing bonds or shares in the stock market. This hierarchy of financial decisions results from characteristics specific to financial markets, as its functioning is more affected by information asymmetries between participants than other markets. For instance, if a firm borrows from a bank to finance an investment project, at start it holds more information than the bank about its own ability to meet the debt service or about the project return and risk. The costs of gathering this information can be quite high, especially if firms are small. Under these circumstances, the interest rate reflects not only the opportunity cost of using internally generated funds, but will be accrued by a premium. Thus these firms may face a higher cost of financing than they would be willing to take, meaning that they face liquidity constraints.

This situation attributes a special role to banks. These will specialise in gathering, compiling and using afterwards specific information on firms. In this case, an exclusive and lasting relationship between a firm and a bank may contribute to contrary the effect of information asymmetries in the lending markets.

However, empirical evidence shows that in some countries firms will tend to raise funds from two or more banks(1). This may be because most studies use data on large firms. Indeed, firms' attributes — namely size — appear to be crucial to the choice between keeping a single bank relationship or switching to a multiple bank one.

This article analyses the issue from an empirical perspective, based on a database covering virtually all firms resorting to bank lending(2). When borrowing for the first time, firms resort to a single bank, maintaining this exclusive relationship for some time. Afterwards, many of these firms switch to another bank or change to multiple bank lending relationships.

The following section summarises the main theoretical arguments about this issue. Section 3 displays the empirical analysis and section 4 concludes.

* The opinions of the paper represent the views of the author, and are not necessarily those of the *Banco de Portugal*.

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(1) See, for instance, the analysis of Steven Ongena and David Smith, "What determines the number of bank relationships? Cross-country evidence", Discussion Paper n º 4/1998, Norwegian School of Management, Department of Business Economics.

(2) For further details on references, methodology and results see the forthcoming *Working Paper*, "Choosing between single and multiple bank lending relationships", by Luísa Farinha and João Santos.

2. SINGLE AND MULTIPLE BANK LENDING RELATIONSHIPS

Part of the literature on this subject focuses on showing the advantages of borrowing from a single bank which has privileged information on its customer. First, because relating with several banks involves multiplying costs, like operating costs of establishing a loan contract. Second, because in the case the firm faces financial problems — which can summit to its bankruptcy — debt renegotiation is easier when one other than many creditors are involved.

Another aspect highlighted by literature deals with the behaviour of the firm in case financing is repeatedly required. If borrowing from the same bank, the latter gathers and accumulates information on the firm — especially concerning its capacity to meet the debt service, but also about the quality of its investment projects. The bank shall then use this information in its lending decisions. It seems reasonable to also admit that the production of information enjoys of economies of scale and that these are not easily transferred. Thus a bank holding more information on the firm can offer it better borrowing conditions, as more funds, lower interest rates or requiring less collateral. This can be crucial to smaller or younger firms, typically showing more difficulties in signalling their true quality to external investors. In general, these firms rely exclusively on bank lending to raise financing.

This exclusivity situation brings however some disadvantages. If the firm develops a single relationship with a bank, it may have to pay an additional premium to raise financing from a less informed bank. This bank will wonder why the firm has not required financing from its usual bank, doubting about the quality of the firm.

Furthermore, if scale economies exist in the production of information and it is not easily transferable between banks, an exclusive bank may acquire a monopoly of information on the firm, allowing it to raise rents.

Therefore, a single relationship between the firm and the bank is advantageous since the creation and reinforcement of such a relationship allows the firm to overcome some of the information problems inherent to financial markets. However, it can also be costly because a single bank may develop an information monopoly on the firm.

Firms may develop specific strategies to lessen these drawbacks. Financing through the stock market or long-term contracting are two examples, which however are not available for all firms. Instead, firms may decide to switch banks frequently or to have a multiple bank relationship. In this context, choosing between a single or a multiple bank lending relationship should depend basically on:

— the value the firm attributes to a single bank relationship, and
— the expected cost of the firm becoming locked-in that relationship.

These aspects can be related to the firm characteristics. The value attributed to the exclusive relationship is above all linked to the incidence of information asymmetries: the greater the likelihood of information problems, the greater are the advantages the firm can draw from a single bank relationship. The expected cost of a firm becoming attached to a bank is higher for firms which are more prone to such a situation — more opaque firms, for instance, but also those where the value of appropriable rents are higher (e.g., greater and more profitable firms, above average growing or investing firms).

Some of theoretical literature focuses on the effect of bank characteristics, like size and liquidity, or that of competition in the banking market on the choice between a single and a multiple bank relationship. Some models show that small firms tend to borrow from smaller banks, hence engaging in more lasting relationships. Others argue that a firm can opt at start to borrow from more than one bank to avoid paying a very high premium if needing to resort to another bank due to a temporary liquidity shortage of its usual bank. Also changes in the structure of the banking system — as those resulting from merger or acquisition operations between banks — may condition firms' choice between single or multiple bank lending, since these events may affect the flow of information concerning firms.

Table 1

NUMBER OF BANKS ACCORDING TO FIRM SIZE — SUMMARY STATISTICS

	<10	10-49	50-99	100-199	>=200	Total
Mean	1.4	2.1	3.0	3.8	5.0	1.9
Median	1	2	3	3	4	1
Coefficient of variation	0.59	0.69	0.68	0.66	0.64	0.79
No. of observations	192264	146358	25151	11808	8937	384518
(as a share of total observations)	50.0	38.1	6.5	3.1	2.3	

3. EMPIRICAL ANALYSIS

3.1 Number of banks according to firm size and age

The data about the relationships between banks and firms presented in this analysis was drawn from a database joining information on the credit portfolio of virtually all banks operating in Portugal. The data on credit balances is monthly compiled by the *Banco de Portugal* with some detail. Indeed, for each debtor/bank pair it indicates the relative share of short-term and medium- and long-term credit, as well as the amount of credit classified as past due.

The sample we use covers the period January 1980-December 1996. The database comprised 14 banks in 1980, and 43 in 1996. Over 170 thousand firms were identified as to have resorted at least once to bank credit.

For our empirical analysis the sample was limited to circa 50 thousand firms for which size and age data were available(3). The information about the number of bank relationships was broken down according to firm size and age. *Ceteris paribus*, smaller and younger firms tend to show greater difficulties in proving their quality to external investors.

According to this sample, firms tend to borrow on average from two banks. However, the median is one bank, meaning that most firms resort to only one bank for financing (table 1).

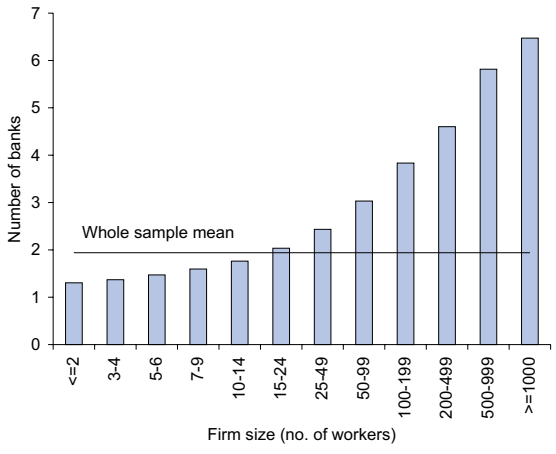
The number of banks per firm also varies according to firm size. Indeed, the average number of banks is 1.4 for very small firms (with less than 10 employees) and 5 for those with over 200 workers (table 1). Most of the latter borrow from 4 banks. Chart 1 suggest that the average number of banks grows sharply with firm size.

The same firm can also change its behaviour over time. The number of banks seems to reflect firm age as well, though contrasts are not as sharp between age classes as they are between the analysed size classes. Firms aged 2 years or less borrow on average from 1.4 banks, while firms older than 20 years resort to 2.5 banks. The bulk of firms with 10 years or less relate to only one bank (table 2 and chart 2).

Chart 3 also shows that the percentage of firms borrowing to a single bank drops sharply with firm size. Over 70 per cent of very small firms

Chart 1

AVERAGE NUMBER OF BANKS ACCORDING TO FIRM SIZE



(3) Size was measured by the number of workers available in the *Quadro de Pessoal*, annually collected by the *Ministério do Trabalho e da Solidariedade*. This database contains since 1982 data on employment in firms with employees.

Chart 2

AVERAGE NUMBER OF BANKS ACCORDING TO FIRM AGE

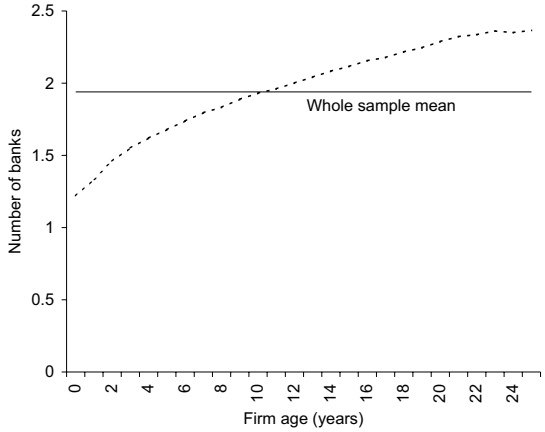
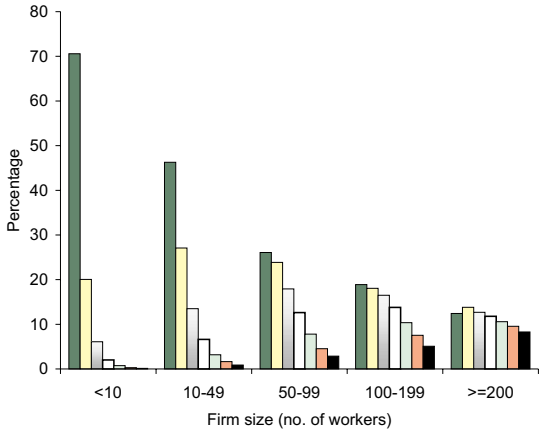


Chart 3

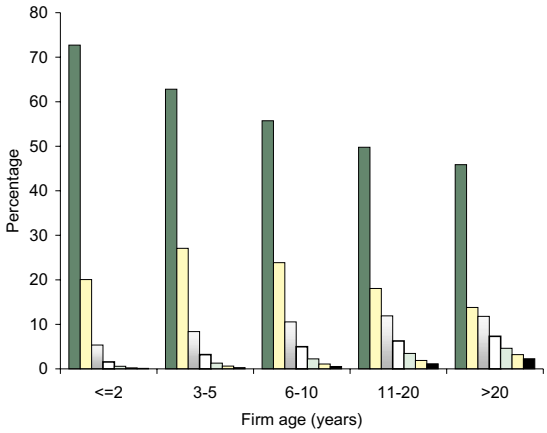
FIRMS THAT BORROW FROM 1, 2, 3, 4, 5, 6 OR 7 BANKS ACCORDING TO FIRM SIZE



have only one bank, while this percentage is marginally higher than 10 per cent for firms with 200 or more workers. The percentage of firms lending from two banks increases from the first to the second size class, decreasing in the following classes; the share of firms maintaining 3 bank lending relationships peaks in the class of 50 to 199 workers. Also worth noting is that the distribution is more even within the class of firms with 200 or more workers. Firms with 7 bank lending relationships are almost as many as those relating to a single bank.

Chart 4

FIRMS THAT BORROW FROM 1, 2, 3, 4, 5, 6 OR 7 BANKS ACCORDING TO FIRM AGE



The share of firms holding a single bank lending relationship also decreases with firm age, though slower (chart 4). Over 70 per cent of younger firms maintain a single bank, while among those aged between 10 and 20 years old this share rises to around 50 per cent.

3.2 Exclusivity duration

To follow the behaviour of firms since the first time they resort to bank lending, the sub-sample of firms starting business after 1980 was used in

Table 2

NUMBER OF BANKS ACCORDING TO FIRM AGE — SUMMARY STATISTICS

	<=2	3-5	6-10	11-20	>20	Total
Mean	1.4	1.6	1.8	2.1	2.5	1.9
Median	1	1	1	2	2	1
Coefficient of variation	0.58	0.66	0.70	0.77	0.85	0.79
No. of observations	42884	72489	93439	101447	74259	384518
(as a share of total observations)	11.2	18.9	24.3	26.4	19.3	

Table 3

MEAN AND MEDIAN OF SOME FIRM CHARACTERISTICS AT DIFFERENT RELEVANT MOMENTS[a]

	Borrowing for the first time	Bank switching	Changing to multiple bank borrowing	End of the sample period
	1	2	3	4
Duration (months)				
Mean	-	24.8	24.1	38.1
Median	-	22	22	37
Age (years)				
Mean	3.2	5.3	4.7	6.7
Median	3	5	4	6
Size (workers)				
Mean	30.9	27.3	54.1	13.5
Median	8	9	14	6
Sales growth (%)				
Mean	39.2	30.3	45.7	21.3
Median	8.9	10.0	11.6	6.4
Investment / Assets (%)				
Mean	10.2	10.1	9.3	11.0
Median	4.0	4.7	4.1	4.8
Tangibles / Assets (%)				
Mean	59.8	54.1	53.6	63.0
Median	39.2	40.3	36.7	39.3
Cash-flow / Assets (%)				
Mean	11.2	11.6	10.0	11.7
Median	9.8	10	8.2	10.7
Bank loans / Assets (%)				
Mean	13.1	11.0	13.8	11.8
Median	8.6	7.1	10.0	6.4
Long-term credit [b]				
Mean	0.086	0.054	0.13	0.046
Median	0	0	0	0
Number of firms	1577	295	707	870

Notes:

(a) In columns 2 and 3, all variables except duration and age refer to the year prior to that recording the bank switch or the change to multiple banks.

(b) Dummy variable; equals 1 if the firm has long-term credit and 0 otherwise.

this part of the study. We observe that most of these (over 90 per cent) resort to a single bank when borrowing for the first time, and hold this exclusive relationship for a while. Afterwards, some of these firms switch banks and maintain a single relationship with another bank. Others change to a multiple relationship some time later.

Since the time running between these events varies from firm to firm, we tested the hypothesis of a link between the length of this period and the attributes of firms or of the lending banks. The results of this analysis should also allow to draw some conclusions about the empirical validity of some of the assumptions on the single relationship / multiple relationship dichotomy suggested by theory.

This analysis was confined to firms that resort to a single bank for the first time they borrow. To relate the information on the firm-bank relationship with other firm attributes, the sample was reduced to firms also included in the Central Balance Sheet database in the relevant periods. Therefore, a much broader set of information is available, though for a much smaller number of firms (1,577 firms). The data available for banks' balance sheets was also used.

Table 3 displays the mean and median of some of the most important variables analysed, at four relevant moments. In column 1 variables were computed for all firms in the sample the first time these resort to bank lending. The figures in column 2 and 3 refer respectively to firms switching

the usual bank for another single bank, and firms changing to multiple bank lending relationships[4]. There is also a set of firms that kept the single bank relationship up to the end of the sample period. For these firms, column 4 exhibits the variable means and medians, calculated for the last period available in the sample[5].

Table 3 shows that the average firm resorts to bank lending for the first time about 3 years after starting business (column 1). At this moment, firm size averages 31 workers. However, it should be noted that the median number of workers — which is less influenced by extreme observations — is 8. The average of the growth rates of sales per firm in the sample is 39 per cent at this moment, and the median is 8.9 per cent.

Variable "duration" measures in months the time elapsed from the first bank loan to the moment it switches to another single bank relationship (column 2) or to multiple banks (column 3). Average and median duration displayed in column 4 refer to the number of months running from the first bank loan up to the end of the sample period, for the set of firms which always borrow from a single bank.

The table shows that some firms in the sample switch to another bank on average 25 months after. Others wait 24 months on average until they borrow from multiple banks simultaneously. The size, the sales growth rate and the share of bank financing — especially long-term financing — are greater for firms changing to multiple banks than for those moving to another single relationship. Firms that maintain the single bank relationship up to the end of the sample period are among the smallest and those growing less. They are also those holding a greater share of colateralisable assets and lower levels of long-term credit.

We used duration analysis to measure the impact of each firm characteristic on the probability of changing from a single to multiple bank relationship.

(4) Exception made for age and duration, all variables refer to the year before that when swapping or switching to multiple banks occurred. Note that some firms switching to multiple banks had swapped banks previously.

(5) Observations corresponding to these firms ("censored" observations) are also taken into account when estimating the duration model.

3.3 Results of the duration models

Duration analysis aimed at finding answers for the following questions:

— Could it be the case that younger firms — those worst known — take advantage of a single relationship but later they increase the number of banks because they expect to become locked in a relationship?
— Do bank attributes and the competition situation in the banking market also determine the change to multiple bank lending relationship?

In the duration model, the dependent variable is given by the time period running from the first bank loan up to the moment it borrows from multiple banks (or up to the end of the sample period for censored observations). The results presented were obtained through a parametric estimation method, assuming a Weibull distribution function. Along with the exponential distribution, the Weibull distribution is the most widely used in duration analysis. Its advantage over the former is that it allows to test the effect of duration on the probability of exit (in this case, single relationship). Duration dependency may be positive or negative, depending on the value of parameter p in the distribution being significantly greater (or smaller) than one[6].

The introduction of explanatory variables in the duration model is straightforward with the Weibull distribution. The sign of the estimated coefficients have a similar interpretation to the traditional regression. The estimated model relates duration with some firm and bank attributes aiming at conveying some of the aspects suggested by the theory. In the estimation, we assumed time-varying regressors.

Regarding firm attributes, we included those better reflecting the incidence of information asymmetries and/or some dependence on the banking system for raising resources (e.g., size, the integration or not in an economic group, the percentage of colateralisable assets and the percentage of non-fixed assets). Also included were the

(6) An estimated value for parameter p is also found as a result of the estimation.

Table 4

DURATION MODEL: RESULTS[a]

	Estimated coefficient	T-ratio	
Firm characteristics			
Number of switches	-0.143	-2.328	**
Belongs to a conglomerate	-0.338	-1.703	*
Size (sales)	-0.209	-9.147	***
Sales growth	-0.001	-4.884	***
Liquidity / Assets	0.697	2.888	***
Intangibles / Assets	-0.821	-0.678	
Tangibles / Assets	0.046	1.081	
Cash-flow / Assets	-0.156	-2.014	**
Tangibles / Assets	0.585	2.129	**
Cash-flow / Assets	-1.650	-7.391	***
Bank Loans / Assets	-0.098	-0.612	
Long-term loans / Bank debt	0.127	1.107	
Past-due loans	-0.844	-4.311	***
p (H0: p<=1)	1.335	6.881	***
Median of the duration (interval of variation)	50.0 - 59.7		

Notes:

(a) The null hypothesis is rejected at: ***12, **5% and *10%.

(b) Dummy variable; equals 1 if the firm had (or has) a doubtful credit situation towards its first bank.

variables conveying the expected cost of a firm being locked-in (size, growth perspectives). The model also screens for other attributes: the auto-financing capacity (measured by liquidity, profitability, indebtedness, doubtful credit); the chances of a firm using alternative strategies to avoid becoming locked-in (like the fact of having or not long-term credit).

We consider in addition a set of variables to control for the effect of the bank and the banking market attributes on the variable under scrutiny [7]. Finally, we include time dummies to control for conditions affecting all firms (such as macroeconomic conditions or institutional aspects).

The results are relatively robust to the choice of the model, the distribution and the sample. The results displayed in table 4 refer to a model that excludes bank and banking market variables, since none of the estimated coefficients was statistically significant individually or as a group. This finding — seeming to indicate that both bank and banking market attributes do not influence firms' choice between single / multiple bank lending relationships — may be due only to the small variability this sample shows regarding these issues. Indeed, Portugal has had a quite homogenous banking system.

The estimated value for *p* is clearly greater than 1[8]. This result suggests that the probability of switching to multiple bank lending rises over time.

Other findings are the following: firms that previously switched banks more often are also those changing to multiple banks more rapidly[9]. Larger firms — those investing more and growing faster — also start raising funds from several banks faster. More profitable and more liquid firms tend to maintain a single bank for longer. Results also suggest that firms that are part of a conglomerate are more prone to shift more rapidly to multiple bank lending.

Finally, stress should be laid on the range of variation of median duration, estimated through the duration model that includes the effect of censored observations. As a result, the sample value of 24.1 months shown in table 3 was clearly surpassed.

The results appear to be consistent with the models explaining the single / multiple bank lending choice as an outcome of firms' weighting of the advantages of a single and lasting relationship — greater availability and a potentially lower cost of credit — and its costs — basically resulting from the information monopoly the bank may achieve. Indeed, the results suggest that smaller or independent firms — to which greater information problems are usually associated — tend to hold a single relationship. Meanwhile, firms that would incur in a greater loss if remaining locked in — the

(7) The following variables of banks are included: size, age, growth, liquidity, profitability and a measure of risk exposure. Market variables are the number of banks in the constituency of the firm and a variable indicating if the usual bank is or not a local bank.

(8) When this parameter is greater than 1, the probability of a situation ending in moment *t*, given that it lasted up to *t*, increases with its duration.

(9) For example, an estimated positive coefficient indicates a positive effect on the duration — i.e., a negative effect on the probability of swapping banks or switching to multiple banks.

larger, more growing and more investing firms — tend to end exclusivity earlier. Unfortunately, the results did not allow to confirm that the opaque firms (i.e., exhibiting a higher share of intangible assets), apparently those with a greater chance of becoming locked-in, tend to shift faster to multiple banks. The parameter has the expected sign, but is not significant as regards the effect of variables "percentage of intangible assets" and "percentage of tangible assets".

4. CONCLUSIONS

The existence of imperfect information in the financial markets conditions monetary policy transmission. From an aggregate point of view, this happens because the additional cost due to existing information asymmetry tends to change accordingly with the interest rates, thus magnifying the effect of monetary policy. From a microeconomic perspective, monetary policy tends to yield different impacts on firms showing distinct financial behaviours.

Some models show that a single and lasting relationship between a firm and a bank can diminish the effects of asymmetric information in the lending market. The bank may gather over time information on the firm, unavailable to other creditors-to-be.

This article related the choice between a single and a multiple bank relationship with firms and banks' attributes, to test the empirical validity of some of the assumptions about the single/multiple relationship dichotomy suggested by theory. The data we use suggest that when resorting to bank lending for the first time, firms tend to prefer a single relationship, maintained for some time. Later, many firms switch to another single relationship or to multiple bank lending. It should be noted that, although some firms end the exclusivity of the relationship with their first bank, they continue profiting from the duration of that relationship. Indeed, two years after firms end the exclusivity, 54 per cent still borrow from the initial bank.

The results convey the importance of relationships established with banks. This is particularly evident as regards smaller firms, usually more subject to liquidity constraints. The results also appear to be consistent with the hypothesis that larger firms or firms with better growth perspectives also weight the disadvantages of the information monopoly developed by a single exclusive bank. As for other countries, the results point towards the relevance of size in explaining the diversity of behaviours among firms.