UNIVERSIDAD CARLOS III DE MADRID

working papers

# BANK DEBT AND MARKET DEBT:

## AN EMPIRICAL ANALYSIS FOR SPANISH FRIMS *

María J. Casasola [1] and Josep A. Tribó [2]

**Abstract**

This paper examines the effect on the firm's banking cost of the issue of debt securities. We argue over the existence of a positive relationship between the issue of market debt and the reduction of firm's banking cost. This idea relies on three main arguments: i) Banks can delegate to investors the supervision task, a feature that makes bank supervision less costly. ii) The issue of public debt increases firms' bargaining power in front of the banks, as the former can get funds through non-bank financing ch annels. iii) Banks with no prior information on the issuing firm may interpret the issue of debt securities as a positive signal of firm's quality. Additionally, we argue that the previous effects are less important for non-first issues and are sensible to the maturity of the bond issued. We empirically test these and other related theoretical results making use of a database of Spanish non-financial firms during the 1993-1998 period. We find empirical support for our theoretical contentions.

**Keywords:** Bank debt, Market debt, Capital cost.

[1] Business Department, Carlos III, C/ Madrid 126 (Getafe), 28903; E-mail: casasola@emp.uc3m.es
[2] Business Department, Carlos III, C/ Madrid 126 (Getafe), 28903; E.mail: joatribo@emp.uc3m.es

# 1. INTRODUCTION

It exists an important amount of literature that shows the positive impact of bank supervision on the reduction of firm's financing costs. For Spain, Zoido (1998) finds out that those firms with banks as shareholders bear a lower financing costs than their counterparts without banks in their ownership structure. Datta *et al.* [1999], for USA, study the effect of a close bank-firm relationship on the cost of capital of the debt issued. The result is the existence of a lower cost for those firms with close bank links.

The previous evidence seems to show the existence of a mechanism of delegation in the task of supervision from the financial markets to the banks [Diamond, 1984]. If this is the case, potential debtholders of bank-related firms do not need to internalize these supervision costs, hence, reducing the returns they ask for. Moreover, the higher the bank commitment with the firm (i.e. when there is an important amount of bank credits, especially with a long length, Sharpe, 1990), the higher the incentives for an efficient bank supervision. This is anticipated by the debtholders who demand a lower premium to invest in. Firms, in this situation, will be interested in using market mechanisms to raise capital. Thus, some sort of complementarity between bank and market debt is obtained.

Within this complementarity framework, we may argue that issuing market debt may have a positive impact on the cost reduction of future firm's bank credits. Thus, we propose a relationship that moves in the opposite direction than that aforementioned. The basic arguments are three: First, the existence of a possible cross-delegation mechanism [Booth, 1992], that would move from the bank to the debtholders. In a similar way that banks can achieve this role for investors, the latter can do the same for the former. This will end up generating a reduction in the firm's bank financing costs. Moreover, market debt, differently to bank debt, is difficult to be renegotiated. This, in turn, induces investors to supervise efficiently in order to prevent firms getting in such a situations of not being able to attend their financial obligations. If so, debt non-renegotiation triggers asset liquidation, with the corresponding loss for debtholders. Banks anticipate this dynamic, and may be willing to delegate supervision tasks in the financial markets.

A second aspect worth to consider is the reduction in the bank bargaining power when they negotiate the credit conditions with those firms that have a non-bank financing channel. This feature, undoubtedly, will generate a reduction in the interest rate that banks demand for their credits [Rajan 1992].

The last argument that may be deemed as relevant to justify the reduction in the bank financing costs for those firms that have issued debt is based on signaling considerations. To issue debt may be interpreted as a good signal of firm's quality due to three main reasons. First, the difficulty to renegotiate market debt allows separating good firms from bad ones, as only the former can afford such a rigid financial instrument. Second, as Diamond [1991] points out in a dynamic model of bank-firm relationships with adverse selection problems, only those firms revealed as good through their banking relations can afford issuing debt in a low-informed market. And third, the existence of some information revelation requirements to attend by those debt-issuing firms precludes bad-quality firms to use market-financing mechanisms.

As a conclusion, all the previous arguments points in the same direction: Firms that issue debt has to bear a lower bank financing costs after they have issued this market instrument. To this respect, Booth [1992] for USA finds out that firms with market debt bear for their bank credits an interest rate premium over reference rates (PRIME, LIBOR, CD), which is clearly inferior to that of their counterparts without debt issues.

Another relevant aspect to study is the differential impact on financing costs triggered by second debt issues in comparison to first ones. Bayless [1994] shows that markets tend to diminish their reactions in successive issues. This feature can be interpreted [Chaplinsky and Hansen (1991)] in terms of the lower degree of information non-anticipated by markets. Thus, a lower reduction in bank financing costs after second debt issues in comparison to first ones is expected. This is a consequence of the lower degree of un-anticipated information on firm's quality carried out by non-initial debt issues.

We contrast these theoretical contentions making use of a database of Spanish non-financial firms for the period 1993-1998. The sample is composed of 16.020 firms. The results we find show that firms that have issued debt bear lower financing costs than their counterparts. Moreover, the reduction in the interest charged by banks after debt issues is more immediate for short-term debt issues than for long-term ones. We also find that firms with multiple debt issues show, on average, a lower reduction on credit interest rate than firms with a unique issue, especially if this is short-term.

The paper has four more sections. In the next one we present the arguments behind the theoretical contentions to be tested. In the third section, we contrast the theoretical hypotheses. Discussion of the results found is made in the fourth section. The paper finishes with some concluding remarks.

## 2. THEORETICAL FUNDATIONS

The degree of competition in credit markets is a major determinant of the firm's cost of capital. Rajan [1992] shows that firm's bank financing costs are directly related to banks bargaining power, which is, among other things, a function of the degree of competition they face from other banks to finance firms. In this line, Agarwal and Leston [2001] for Germany and Weinstein and Yafeh [1998] for Japan, show that firms with a strong relationship with banks (*main bank* system in Japan) have limited access to alternative financing sources. Consequently, a raise in their cost of capital follows. Similarly, Hoshi *et al.* [1990] find that once the Japanese bond market was liberalized, firms increased their bargaining power in front of banks as they began to use this alternative mechanism to obtain funds. In Diamond [1991], another aspect is introduced: The quality of the issuing firms. It is shown, in a context with adverse selection problems, that only those bank-financed firms that have proved to be of good quality have the possibility to obtain funds through the market. Obviously, in that case we may speculate that banks will react to try to recover these good-quality firms by offering them a reduction in the financing costs. This is, precisely, the point of the paper. Booth [1992] for USA finds that those debt-issuing firms bear a cost of capital for their bank credits lower than that of their counterparts without issued debt.

From the previous studies, a conclusion emerges: There is a positive relationship between the reduction in banks market power, and the reduction in firms' bank financing costs. In our case, firms' debt issue is what triggers the former reduction.

In another line of research, Petersen and Rajan [1995] conclude that it exists a counter veiling effect to that previously described. This effect appears in contexts with high information asymmetries (moral hazard combined with adverse selection). These authors show that short-term credit interest rates are decreasing with bank market power. The reason is that those banks with market power can afford to optimize intertemporally, without restrictions, the rates they charge for their credits. In that case, they do in such a way to reduce informational incentive problems. The strategy is to initially decrease the rates in order to avoid "good" firms to be engaged in risky projects. Afterwards, once the bank has been willing to discriminate firms according to their short-term results, it raises the (long-term) rates proportionally to its market power. This is a way to compensate for the initial losses

carried out by the low short-term rates policy. Finally, we should mention other studies [Covitz, and Heitfield, 1999], which also obtain the results of Petersen and Rajan, but focusing on double moral hazard situations (by banks and firms).

As a synthesis of the previous arguments, it seems that the key to obtain a positive or a negative impact of bank market power on the firm's bank financing costs is the degree of information asymmetries between borrowers and lenders.

*Thus, in such a contexts with high information asymmetries, credit interest rate decreases with bank market power. However, when information asymmetries are less important, the previous decreasing relationship becomes an increasing one.*

As we have mentioned before, bank bargaining power in negotiating with the firm, not only depends on the degree of competition in the credit market, but also on the existence of alternative firm's financing channels like the debt issue. To this respect, there are three effects that emerge once a firm starts issuing debt.

First, an increase in firm's market power due to it exists alternative financing mechanisms to bank credit.
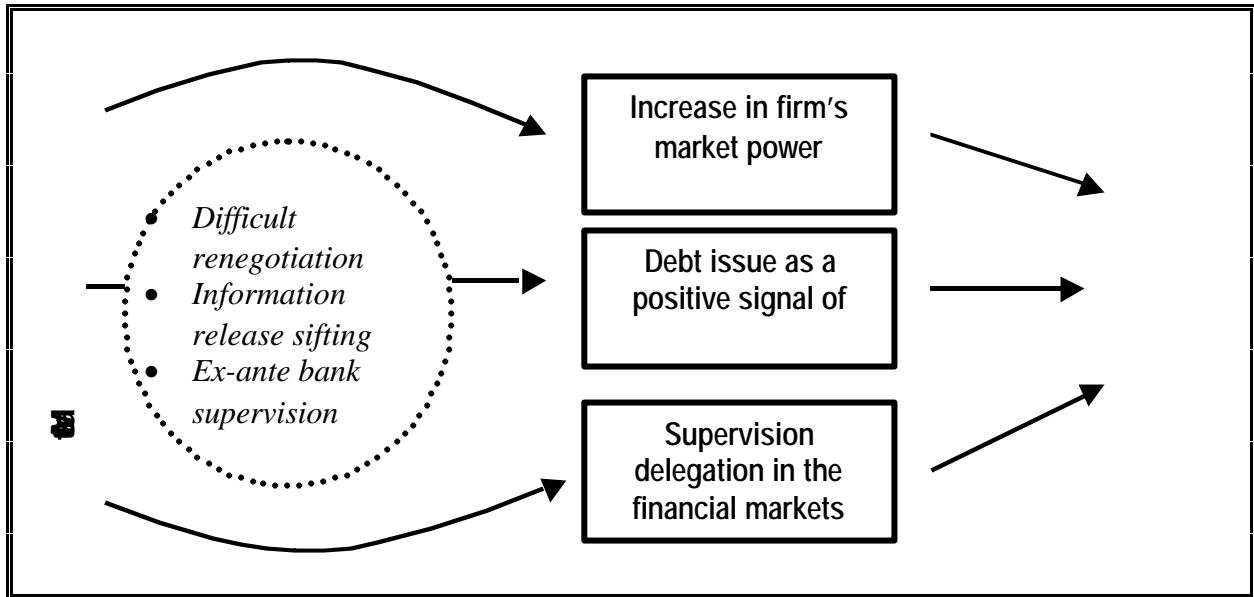
Second, there is an informative signal about firm's quality. The issue of corporate debt is interpreted as a positive signal for those banks without initial information about the firm. This is connected with three points. First, market debt is difficult to be renegotiated. Thus, a firm will only use this instrument if it has a minimum quality to be able to satisfy the corresponding payment obligations; otherwise, it risks to be liquidated [Bolton and Freixas, 2000]. The second reason to interpret debt issues positively is that issuing firms are obliged to release internal information to the markets by the regulatory institution. This feature prevents bad-quality firms to use this mechanism [Yosha 1995]. Finally, the third signalling argument is based on models like Hadlock and James (2002); and Diamond (1991) where only those initially bank-financed firms with good quality are willing to issue debt instruments. In so doing, potential new lenders can interpret debt issues as a good signal. With this behavior, there is a delegation of the supervision task from after-issue lenders to before-issue banks [Johnson, 1997]. These posterior-issue banks consider these firms as good because some initial banks judged them as good. And, precisely this judgment allowed firms to use the market mechanism to raise capital.

As a consequence of the previous arguments, we can conclude that debt issues reduce information asymmetries between borrowers (firms) and lenders (banks), as they can be interpreted as firm's good-quality signals. A reduction in firm's cost of capital should follow.

Finally, there is a third effect, which is a continuity of the previous one. If banks take as good the signal to raise capital through the markets, there is an implicit firm's supervision delegation. This feature undoubtedly will reduce bank's supervision costs, and lately firm's bank financing costs.

We can synthesize the previous arguments in Figure 1.

FIGURE 1
EFFECTS OF A DEBT ISSUE



*Difficult renegotiation*
*Information release sifting*
*Ex-ante bank supervision*

Increase in firm's market power

Debt issue as a positive signal of

Supervision delegation in the financial markets

What is relevant is that by combining the previous effects leads, on the one hand, to a reduction of information asymmetries as well as informational costs, and, on the other hand, to an increase in firm's bargaining power. The conclusion: an unambiguous reduction in bank costs after the issue. This is the central hypothesis to be tested empirically.

*Hypothesis 1*: *Firms that issue debt pay lower interest rates for their bank credits after the issue.*

Furthermore, we should expect that those firms that have issued short-length debt, experience the reduction in their financing costs more immediately than those other firms that raise capital using long-length financial instruments. Once the debt issued vanishes, firms will borrow new capital [Johnson, 1997]. It is in this moment when new credits with improved conditions are asked for. Obviously, the shorter the length of the existing debt, the more immediate will be the emergence of these new credits with a lower interest rate.

*Hypothesis 1b*: *Firms that issue short-term debt experience a reduction in their cost of capital earlier than those other firms that issue long-term debt.*

Diamond [1991] argues that those firms that have proved their quality through their banking relationships can afford to issue debt in a better conditions than those defined in the initial bank credits. If we introduce an additional sequence to the Diamond model by allowing banks to react to these debt issues, a natural reduction in the firm's capital costs should emerge as a way to retain these good-quality firms. Obviously, in so far as banks have the perception that a firm is not eventually "recoverable" (*i.e.* it uses market financing mechanisms frequently), it makes no sense to offer them a reduction in their credit cost. Firms with multiple debt issues are natural candidates to this respect.

There is a second informational argument that is deemed to be relevant in explaining the previous statement: Non-initial debt issues are less informative than the initial ones. In this line, Bayless [1994] study market reaction when a firm issues equity in one case, and debt in the other. He considers two scenarios by distinguishing initial and non-initial debt issues. The result found is a higher differential in market reaction for initial debt issues (4.15% to

2.88% respectively). Following the argument, Chaplinsky and Hansen [1991] show evidence that shares react more vigorously to debt issues that convey non-anticipated information. This empirical finding allows us to interpret the Bayless [1994] result over the lower shares reaction to non-initial debt issues in terms of the lower informational content of these issues in relation to the initial ones. Banks have already inferred the good quality of the issuing firm after the initial issue. Thus, there is barely an increment of information in the following issues. This feature limits the reduction in the credit costs of those firms with multiple issues. This is what configures Hypothesis 2:

*Hypothesis 2*: Those firms with multiple debt issues achieve, on average, a lower reduction in their capital costs than those other firms with a unique debt issue.

To be more precise, the previous result is especially relevant for the case of long-term debt issues, which are far less frequent than short-term ones. This latter debt has to be returned (or refinanced with new issues) in one-year time. This feature, consistently with hypothesis 2, should lead banks to concentrate the reduction of capital expenditures in those firms that use long-term debt to raise funds, independently of the number of occasions that have done so. A different way to get in this statement is based on the higher degree of information carried out by long-term debt in comparison to short-term one. Investors are aware of the superior risks of the former debt, and, in principle, they will be more demanding on the quality of the issuing firm. Conversely, firms anticipate this feature and only those ones with especially good quality may afford to use this financial instrument. Cai, *et al* [1999] show, for Japan, that those firms with a high proportion of debt, the best ones according to Diamond [1991], issue more long-term debt than short-term. This leads us to postulate a more vigorous reaction of banks in reducing firm's credit costs after a succession of different long-term debt issues in comparison to a succession of short-term ones.

*Hypothesis 2b*: *Firms with multiple long-term debt issues, enjoy lower credit expenditures than those other firms that have issued short-term debt in different occasions.*

Obviously, from the previous hypotheses, we may argue that firms that had issued debt in the past, as they have obtained a reduction in their credit costs, are more willing to borrow new capital through this channel [Johnson, 1997]. Moreover, there is a clear preference for new credits with shorter maturities, because this allows firms to ask for a frequently-improving financial conditions. This states the following hypothesis:

*Hypothesis 3*: *Firms that issue debt ask for more bank credits, especially with* short *length, in those periods after debt issues.*


# 3. EMPIRICAL ANALYSIS

## 3.1. SAMPLE DESCRIPTION


We carry out our empirical investigation for the period 1993-1998, making use of a database, SABE (Sistema de Análisis de Balances Españoles), compiled by Bureau Van Dijk. This database surveys balance sheet, income statement and other complementary financial information of more than 200,000 Spanish companies with all sizes, and it is widely

distributed among all economic sectors [3]. To clean our initial sample, we have applied some filters (See Appendix).

We should mention, first of all, that database design problems has obliged to focus on short-term bank credit costs (less than one-year maturity). The particular variable used to measure these costs is the ratio of short-term interests of bank debt divided by short-term bank loans. Besides, and in order to be consistent with this short-term analysis, we have introduced an additional filter: All those observations with the previous ratio equal to 1 are dropped. Two reasons justify this disregard. First, possible accounting mistakes. Second, and most importantly, this unitary ratio may reflect a situation where short-term interests can just be an accounting reclassification of an initial long-term credit interests. In that case, obviously, this interest rates fixed in the past are not modified after current debt issues.

The final sample is an unbalanced panel data composed of 16,020 firms, with 56,484 observations. Table I reports the total amount year-by-year of the capital raised through debt issues. We distinguish between short-term debt issued (STDI=1) and long-term debt issued (LTDI=1). We can observe that this financing mechanism is relatively recent in Spain, until 1995 no company in the sample issued debt.

TABLE I

**ANNUAL AMOUNT OF CAPITAL RAISED WITH SHORT AND LONG-TERM DEBT, 1993-1998.**
(MILLION OF PESETAS)

|          | *1993* | *1994* | *1995*    | *1996*      | *1997*      | *1998*     |
|----------|--------|--------|-----------|-------------|-------------|------------|
| **STDI=1** | 0      | 0      | 5.250565  | 45,278.94   | 50,375.33   | 53,268.85  |
| **LTDI=1** | 0      | 0      | 611.8124  | 100,876.2   | 107,759.5   | 111,370.3  |
| **Total**  |        |        | 617.06297 | 146,155.14  | 158,134.83  | 164,639.15 |

There is an increasing use of this financial instrument, a feature that is consistent with the development of Spanish financial markets during the past decade. Furthermore, there are some macroeconomic events that may help to explain the importance achieved by this financing channel in Spain. First, there is a decreasing evolution of the official rates in Spain to gain qualification for the EMU. This feature, undoubtedly, promoted debt issues. Second, the own creation of a common financial market with a unique currency has also helped the use of this type of financial instrument.

**3.2 VARIABLE DESCRIPTION**

In this section, we define the variables used throughout the paper to study the effect of firm's issue of short and long-term debt on the evolution of their short-term bank costs. Boxes I, II and III below report dependent, explanatory and control variables, respectively.

---

[3] We disregard financial firms.

## Box I
### DEPENDENT VARIABLES

| | |
|---|---|
| *STBC* | *Short-term bank costs.* It is the ratio of short-term debt interests to total short-term bank loans. |
| *VSTBC* | *Short-term variation of bank costs.* It is the difference of STBC between period t+*1 and period t*. |
| *VSTBC1* | *Short-term variation of bank costs in t+1*. It is the former variable one period ahead. |
| *VSTBC_1* | *Short-term variation of bank costs in t-1*. It is the VSTBC variable lagged one period. |

## Box II
### EXPLANATORY VARIABLES

| | |
|---|---|
| *LTDI* | *Long-term debt issued*: Binary variable that it is equal to one (zero) if the company has (not) issued long-term debt in period *t*. |
| *STDI* | *Short-term debt issued:* Binary variable that it is equal to one (zero) if the company has (not) issued short-term debt in period *t*. |
| *DLTDI* | It is equal to one when a company has issued long-term debt in period t, and has also done in the past. It is zero otherwise. |
| *DSTDI* | It is equal to one when a company has issued short-term debt in period t, and has also done it in the past. It is zero otherwise. |

## Box III
### CONTROL VARIABLES

| | |
|---|---|
| *BDCD* | *Bank loans to costly debt ratio*. It is the ratio of the overall amount of bank credits to the total costly debt. |
| *CDM* | *Costly debt maturity.* It is the ratio of short-term to long-term costly debt. |
| *MIBOR* | It is the Spanish interbanking three-months rate. |
| *LEV* | *Leverage Ratio*. It is composed by the external funds (total debt) of the company divided by firm's capital. |
| *NSTBD* | *New short-term bank loans*. It is the new bank credits of a firm in period t. |
| *NSTBD1* | *New short-term bank loans in t+1.* |
| *NSTBD2* | *New short-term bank loans in t+2.* |
| *NLTBD* | *New long-term bank loans.* It is the new bank credits of a firm in period t. |
| *NLTBD1* | *New long-term bank loans in t+1.* |
| *NLTBD2* | *New long-term bank loans in t+2.* |
| *TANG* | *Tangible Assets.* Fixed assets to total assets. |
| *SALES* | *Total sales* is used as a proxy for firm`s size. |
| *ROA* | *Return on Assets.* It is the ratio of earnings before interests and taxes to total assets. |

## 3. 3. DESCRIPTIVE ANALYSIS

We divide this descriptive study into two parts. First, we carry out a mean test analysis of the differences between the new bank loans obtained by issuing and non-issuing companies (Table II). Second, we address the question of variations in the short-term bank costs (VSTBC) after debt issues (Table III).

### TABLE II
### MEAN TESTS DIFFERENCES OF NEW SHORT AND LONG-TERM BANK LOANS

| | STDI= 0 Mean[2] | STDI= 1 Mean[2] | P-value [1] | LTDI= 0 Mean[2] | LTDI= 1 Mean[2] | P-value [1] |
|---|---|---|---|---|---|---|
| NSTBD | 15,356 | 3,592,594 | 0.00 | 21,573 | 1,756,320 | 0.00 |
| NSTBD1 | 21,132 | 2,346,664 | 0.00 | 24,986 | 640,269 | 0.018 |
| NSTBD2 | 14,651 | 2,655,020 | 0.00 | 13,959 | 3,584,147 | 0.00 |
| NLTBD | 112,530 | 8,600,072 | 0.00 | 112,030 | 1.05e+07 | 0.00 |
| NLTBD1 | 121,392 | 7,561,379 | 0.00 | 121,885 | 8,712,855 | 0.00 |
| NLTBD2 | 63,814 | 74,672 | 0.98 | 64,484 | -382,076 | 0.38 |

[1] All p-values are associated with the mean difference test.
[2] These values are all corrected by year, size and sector. This is made taking differences with the median for each year, sector and size (small, less than 50 employees, median between 50 and 200 and large more than 200 employees).

Table II shows the mean test, corrected by sector, year and size, of the total amount of new bank loans captured by issuing and non-issuing companies. We distinguish two different situations: Short and long-term debt issues. The result is that independently of the debt maturity, issuing firms obtain far more credits than their counterparts. It is interesting to note that the former effect does not take place only in the issuing period, but also in the next period, as well as in some cases two periods later. This is consistent with hypothesis 3 [4].

Two additional comments can be made. First, two periods after the issue, there is no substantial differences in the new long-term bank loans between issuing and non-issuing firms. This is consistent with the clear preference for credits of short maturity by issuing firms as suggested in hypothesis 3. Second, once we focus on issuing firms, those with long-term debt, ask significantly for more bank credits later than those firms issuing short-term debt. In particular, the increase in the new loans two periods after the issue (t+2) and the next period of the issue (t+1) is clearly higher for the former firms than for the latter (459.79% versus 13.44%). This is reversed when we focus on more immediate periods after the issue (period t+1 and period t). We are going to see the consistency of these results with those of the evolution of bank credit costs (Table III). The reduction of bank credit costs after a debt issue (which eventually triggers the demand for new credits), is less immediate after long-term debt issues.

To inspect this feature, Table III reports the difference of short-term bank costs between issuing and non-issuing firms. To use variations costs allows neglecting possible long-term residual incorporated to this measure by accounting reclassification of long-term

---

[4] A more detailed analysis of size effects in this relationship has been undertaken (which is not explicitly reported here). The results suggest that issuing companies are mainly the largest; however, it is no longer true that these companies are those that ask for the higher amount of new bank credits. Therefore, the driving force of the previous correlation is not the size.

interests into short-term as debt approaches its extinction. This would disturb the analysis as these "short-term" interests were contracted before the issuing period [5].

<div align="center">

**TABLE III**
**MEAN TEST OF DIFFERENCES IN THE VARIATIONS OF SHORT-TERM CREDIT COSTS**

</div>

| | STDI= 0 Mean (%) | STDI=1 Mean (%) | P-value [1] | LTDI= 0 Mean (%) | LTDI= 1 Mean (%) | P-value [1] |
|---|---|---|---|---|---|---|
| **VSTBC_1** [2] | 0.33 | 2.09 | 0.00 | 0.33 | 2.97 | 0.00 |
| **VSTBC** [2] | 0.34 | -0.81 | 0.083 | 0.34 | 0.19 | 0.84 |
| VSTBC1 [2] | 0.26 | -1.29 | 0.12 | 0.26 | -2.37 | 0.02 |

[1] These figures correspond to mean tests p-values for each variable corrected by year and sector.
[2] See variable definition in Box II.

Table III shows that in those periods where companies issue debt there is an increase in the credit cost with regard to the pre-issue period (VSTBC_1 variable is higher). We might speculate that debt issues can be motivated by this increase in the credit cost of capital.

However, what is relevant, is that once debt has been issued, independently of its maturity, short-term bank costs decrease with time. To be more precise, when debt issued is short-term (long-term), the reduction takes place one (two) period later. Therefore, we find a persistent effect of debt issues in the credit costs reduction, and a more immediacy effect for short maturities. This is consistent with our Hypothesis *1b*. Moreover, this also conforms to Table II where demand of new credits is concentrated in early periods (t+1) for short-term debt issues, while it is postponed two periods later in case of debt issues of longer maturity.
In order to get robust results, we present an econometric analysis in the next section.

## 3. 4. ECONOMETRIC ANALYSIS. METHODOLOGY

The empirical specification to analyze the variation of short-term credit costs (VSTBC) is given by the following equation:

$$VSTBC_{it} = a + b_1 STDI_{it} + b_2 LTDI_{it} + b_3 MIBOR_{it} + b_4 BDCD_{it} + b_5 CDM_{it} +$$
$$+ b_6 LEV_{it} + b_7 SALES_{it} + b_8 ROA_{it} + b_9 TANG_{it} + y_t + h_i + e_{it}$$

where $e_{it}$ denotes the error coefficient, which is normally distributed with zero mean and $\sigma^2$ variance.

We estimate bank variation costs considering two dummy variables for the short-term debt issues (STDI) as well as for the long-term ones (LTDI). Additionally, some control variables are considered which are quite common in this literature. In this sense, Ocaña *et al* (1994) derive in a partial-equilibrium model an implicit expression of the firm's cost of capital in a competitive credit market environment. Different factors emerge: i) the risk-free interest rate, proxied by the MIBOR variable; ii) the expected firm's economic performance, proxied by the ROA ratio variable; iii) firm´s size, proxied by the total amount of sales (SALES); iv) firm's financial leverage (LEV); v) Firm collateral, proxied by TANG; vi) business economic risk measured by the costly debt maturity (CDM), since the lower the debt length, the higher the risk bore by the company for a given investment return[6]. This feature is

---

[5] This process complement the filters applied in Section 3.1.
[6] Mato (1989) and Segura and Toledo (2001) identified different variables of solvency like maturity as another possible determinant of the cost of capital.

also wrapped up in the size variable (SALES), since large companies have access to a better diversification, which reduces their risk. Because of the specific problem we are studying, we consider a measure of the firm bargaining power. A natural candidate is the proportion of bank debt over total costly debt (BDCD). The higher a company bank debt level, the higher bank capacity to impose its own interests. But, another interpretation can be admitted. A high proportion of bank debt can be a measure of a bank commitment with the firm (Sharpe, 1990). We will find that this last interpretation is the dominant. Finally, we allow for unobservable heterogeneity ($h_i$) and temporal effects ($y_t$).

The estimation will take advantage of the panel structure of the data. This will allow to manage the unobservable firm's heterogeneity as well as its possible correlation with explanatory variables (fixed effects). If this is the case, the estimations will be biased, and the within group estimator should be used. Once we apply the Hausman test to all the specifications, the existence of the previous correlation is confirmed, and the within group estimation is the only consistent one. Additionally, we use the Sargan test to analyze possible endogeneity problems not directly associated with the unobservable heterogeneity ($h_i$). The reason is that a financial decision like to issue debt can perfectly be a consequence of the current bank credit costs. This leads to a second endogeneity problem that would make the within groups estimator inconsistent. In order to tackle this problem, we apply the Sargan test, which rejects this second endogeneity issue. Thus, the within groups estimator can be applied.

Table IV shows estimations of the effect of firms` debt issues with different maturities on the variation of the short-term bank credit costs between period t+1 and period t (VSTBC). In column (1) there is no distinction of debt issues with different maturities, while in column (2), short-term debt issues are separated from long-term ones. Finally, in column (3), two crossed dummies variables (DSTDI and DLTDI) are introduced. This allows distinction firms with multiple debt issues (DSTDI=1 for long-term and DLTPDI=1 for short-term) from those others with a unique issue.

Finally, Table IV shows the corresponding estimations to the variation of bank credit costs between period t+1 and period t+2. Once again, Hausman tests reveal the existence of fixed effects, and, Sargan tests do not provide evidence of the existence of the second endogeneity problem aforementioned, so the fixed-effects estimator can also be applied.

## 4. RESULTS AND DISCUSSION

Table III shows that overall public debt issues have a negative and significant (99%) impact on the increases of short-term credit costs. This is consistent with Hypothesis 1. Once debt issues are separated by their maturity, column (2) shows the driving effect is connected with short-term debt issues. This finding supports the evidence presented in Table III, where bank credit costs decrease the period after the issue only for short-term debt, but not for long-term, where the reduction takes place two periods later. Finally, the information provided in column (3) shows that credit costs are not reduced for firms with multiple short-term debt issues, (the negative coefficient of STDI cancels out with the positive coefficient of DSTDI). This evidence is consistent with Hypothesis 2.

Concerning the control variables, we can extract the following conclusions. First of all, risk-free interest rate, MIBOR, is statistically significant to explain bank variation costs. Increases in period-t MIBOR have a positive impact on the next-period bank credit costs. SALES variable, as a proxy of firm size, suggest that largest companies show a lower increase in their short-term bank costs. So, if credit costs decrease (increase) for all the companies, large companies achieve a superior decrease (lower increase). This result relies on the grounds of a positive correlation between firm size and its bargaining power with respect

to banks. Another possible argument is that large companies are more likely to have banks as shareholders, which, in principle, will be more willing to favor firm's interests (*i.e.* by reducing its credit cost). In a similar way we can justify the negative and significant coefficient associated with bank debt variable (BDCD). Those companies with high levels of bank debt are more likely to have banks in their ownership structure [Zoido (1998)]. Another interesting result is the negative and significant coefficient associated with tangible assets (TANG). These are natural collateral assets to achieve a reduction (or a lower increase, depending on the case) in credit costs. Finally, those companies with high economic performance (high ROA) are compensated with lower financial costs.

In order to analyze credit cost variation between period t+1 and period t+2, we conduct a similar estimation to that of Table IV (period t), but using VSTBC1 as dependent variable. The results are reported in Table V. However, we should mention the existence of a couple of differences with regard to the estimations of Table IV. First, control variables are all leaded one period. This is made to better capture the effect of period-t debt issues on next-period credit variation costs. Second, in columns (2) and (3) STDI (short-term debt issued) variable is leaded one period. This is to test Hypothesis 1b, and inspect whether it exists earlier effects on the variation of credit costs linked to the short maturity of the debt issued. We expect so according to the preliminary evidence shown in Tables II and II.

There are two important results to stress: First, in column (2) there is a negative and significant impact of period-(t+1) short-term debt issues as well as period-t long-term debt ones on bank variation costs between period t+1 and t+2. This finding fully supports Hypothesis 1b. It is also consistent with the evidence reported in Table II over the amount of new bank loans contracted after the issuing period contingent on the maturity of the debt issued.

Second, column (3) shows that those multiple-issuing companies only show a reduction in their credit costs if they issue long-term debt. This supports Hypothesis 2b.

We complement the previous results by reporting evidence of the issuing frequency of short-term and long-term debt issues. As postulated in the theoretical framework, those multiple-issuing companies show a higher frequency of short-term debt issues than of long-term ones. In particular, 2.23 times for companies who issue only short-term debt, versus 2 times for companies who issue only long-term debt. Thus, we should expect that banks give up to "recover" the former companies through a credit bank reduction, as those companies are using the market mechanism very often. By contrast, if the multiple debt issues are long-term, because they take place less often, banks can try to "recover" those companies through the mentioned credit cost reduction. This is precisely what we find in column (3) consistently with Hypothesis 2b.

Notice that, as expected, all control variables effects found in period-t credit cost variation specification also holds in period-(t+1) one. Under this latter estimation all control variables are leaded one period ahead, so they are contemporaneous to the dependent variable like in table IV.

**[INSERT TABLE IV ABOUT HERE]**

**[INSERT TABLE V ABOUT HERE]**

Finally, it is worth to emphasize that by satisfying the results concerning multiple debt issues, our study allows separating informational-type theories from those based on bargaining power relationships. The former type can explain these results but the latter do not. In principle, companies` bargaining power should be increasing with the number of debt issues. As a consequence, a greater bank credit cost reduction should be expected, not a lower

as it is found. Thus, as a concluding statement, we should emphasize the importance of informative considerations to explain the interaction between bank and market debt.

## 5. SUMMARY AND CONCLUSIONS

In this paper we analyze the effect of firm's debt issues, with short and long-term maturity, on the evolution of firm's bank credit costs. We argue over the existence of a positive impact of these issues on the reduction of post-issues firm's credit cost. We base this idea upon three main arguments: i) banks can delegate to investors supervision task, a fact that makes banks supervision costs cheaper; ii) by issuing debt, firms increase their bargaining power with regard to banks, because the former can get funds through alternative financial channels; iii) debt issues are interpreted as a signal of firm's high quality. Additionally, we argue that the shorter the maturity of the debt issued, the earlier the reduction of bank credit costs of the issuing firm. Finally, a result concerning multiple debt issues is stated: Firms that raise capital through frequent short-term debt issues present, on average, a lower reduction in their credit costs than their counterparts with a unique issue. This is no longer true for long-maturity issues. The idea is the existence of an information signaling dilution, especially in case of short-term debt, as frequent issues are undertaken.

In order to test empirically our theoretical hypotheses, we use a sample of non-financial Spanish firms, during the period 1993-1998. The data are gathered from a database (SABE) of more than 200.000 firms. After implementing some filters, an unbalanced panel data sample of 16,020 firms and 56,484 observations came out.

An initial descriptive evidence shows that companies that raise capital with short-term debt get a reduction in their bank credit cost one period later after the issue, while those other that use long-term debt have to wait until two periods later to achieve this reduction. Furthermore, and consistently with this feature, the former firms obtain more new bank loans (with these improved conditions) in the issuing periods and the following ones, while the latter show a superior bank credit activity two periods later.

In the econometric study, once we control for the existence of fixed effects, we find robust evidence that short-term debt issues generate a reduction in firms' short-term bank costs in the period after issuing. But, long-term issues effects do not appear until two periods later. This feature confirms the theoretical discussions.

Additionally, we distinguish companies that carried out only one issue from those others with multiple issues. The results show that credit cost reductions are not relevant for multiple short-term debt issues. But, this is not true for long-term issues, where the cost reduction after an initial issue is as high as that after posterior ones. This evidence is also consistent with the theoretical framework presented.

As a limitation of our paper, there is no data on long-term bank credit costs. However, we expect that the results for these costs would even be stronger than those found for short-term credits. The reason is that long-term credit is a more effective way to lure issuing firms. Thus, banks will be more willing to reduce the costs of these credits for issuing firms in order to try to "recover" these high-quality firms.

The real implications of these findings to Spanish companies are twofold. First, we provide evidence over the existence of additional benefits to issue debt: there is a reduction in the post-issue credit costs. Second, the additional economic efforts to issue long-term debt are compensated by the lasting effect on bank credit costs reductions.

Finally, we should mention that we expect to find empirical evidence in the same direction when companies obtain funds through equity issues instead of debt ones. This is left for future research.

## TABLE IV

### EFFECT OF FIRM DEBT ISSUES ON SHORT‑TERM BANKING VARIATION COSTS BETWEEN PERIOD T AND T+1.

|  | Fixed effects estimation (1) | Fixed effects estimation (2) | Fixed effects estimation (3) |
|---|---|---|---|
| **Explanatory Variables** | | | |
| *PID* | -0,026*** | | |
|  | (2,446) | | |
| *LTDI* | | -0,010 | -0,012 |
|  | | (0,733) | (0,843) |
| *STDI* | | -0,029** | -0,047*** |
|  | | (2,056) | (2,674) |
| *DLTDI* | | | 0,017 |
|  | | | (0,315) |
| *DSTDI* | | | 0,047* |
|  | | | (1,759) |
| **Control Variables** | | | |
| MIBOR | 0,003*** | 0,003*** | 0,003*** |
|  | (6,318) | (6,320) | (6,363) |
| *BDCD* | -0,015*** | -0,015*** | -0,015*** |
|  | (3,819) | (3,820) | (3,838) |
| *LEV (exp-10)* | 87,0 | 87,7 | 89,2 |
|  | (0,045) | (0,045) | (0,046) |
| *CDM* | 0,005 | 0,005 | 0,005 |
|  | (0,772) | (0,749) | (0,744) |
| *SALES (exp-10)* | -2,36* | -2,39* | -2,58* |
|  | (1,556) | (1,580) | (1,697) |
| *ROA* | -0,029*** | -0,030*** | -0,029*** |
|  | (2,708) | (2,694) | (2,685) |
| *TANG* | -0,026** | -0,025** | -0,025** |
|  | (1,784) | (1,781) | (1,782) |
| *CONSTANT* | -0,003 | 0,003 | 0,003 |
|  | (0,388) | (0,374) | (0,377) |
| **Number of observations** | 18082 | 18082 | 18082 |
| **Hausman Test[1]** | 20,34 | 21,99 | 22,10 |
|  | (0,009) | (0,009) | (0,024) |
| **Goodness of Fit[2]** | 10,82 | 9,67 | 8,20 |
|  | (0,000) | (0,000) | (0,000) |
| **Sargan Test[3]** | 2,85 | 5,430 | 9,42 |
|  | (0,828) | (0,607) | (0,399) |

T-Statistics are in parentheses: ***p-value< 0.01, ** p-value<0.05, p-value< 0.10

[1] $X^2$ – Statistics and Hausman test p-value: equality test between fixed and random effects models.

[2] Statistics and p-values of the goodness-of-fit model. In the fixed effects case corresponds to *F-Statistics*.

[3] $X^2$ –Statistics and Sargan endogeneity test p-value: equality test between ordinary least squares and instrumental variable models. Because the fixed-effect model is the resulting one, we apply Sargan test to the model with first differences.

TABLE V

**EFFECT OF FIRM DEBT ISSUES ON SHORT-TERM**
**BANKING VARIATION COSTS BETWEEN PERIOD T+2 AND T+1.**

| | Fixed effects estimation (1) | Fixed effects estimation (2) | Fixed effects estimation (3) |
|---|---|---|---|
| **Explanatory Variables** | | | |
| *LTDI* | -0,024 | -0,026* | -0,034** |
| | (1,371) | (1,611) | (2,021) |
| *STDI* | -0,004 | | |
| | (0,243) | | |
| *STDI1* | | -0,031*** | -0,054*** |
| | | (2,390) | (3,141) |
| *DLTDI* | | | 0,041 |
| | | | (0,670) |
| *DSTDI1* | | | 0,055** |
| | | | (2,042) |
| **Control Variables** | | | |
| *MIBOR1* | 0,003*** | 0,003*** | 0,003*** |
| | (6,265) | (6,220) | (6,248) |
| *BDCD1* | -0,015*** | -0,015*** | -0,015*** |
| | (3,832) | (3,817) | (3,845) |
| *LEV1 (exp-10)* | 85,1 | 85,1 | 86,2 |
| | (0,044) | (0,044) | (0,044) |
| *CDM1* | 0,005 | 0,005 | 0,005 |
| | (0,764) | (0,757) | (0,751) |
| *SALES1 (exp-10)* | -2,22 | -2,15 | -2,29 |
| | (1,463) | (1,417) | (1,505) |
| *ROA1* | -0,030*** | -0,030*** | -0,030*** |
| | (2,745) | (2,711) | (2,702) |
| *TANG1* | -0,026** | -0,026** | -0,026** |
| | (1,816) | (1,797) | (1,805) |
| *CONSTANT* | -0,003 | -0,003 | -0,003 |
| | (0,370) | (0,349) | (0,340) |
| **Number of observations** | 18077 | 18077 | 18077 |
| **Hausman Test[1]** | 16,72 | 21,76 | 22,08 |
| | (0,053) | (0,01) | (0,02) |
| **Goodness of Fit[2]** | 9,27 | 9,90 | 8,51 |
| | (0,000) | (0,000) | (0,000) |
| **Sargan Test[3]** | | 2,90 | 5,41 |
| | | (0,89) | (0,79) |

T-Statistics are in parentheses: ***p-value< 0.01, ** p-value<0.05, p-value< 0.10

[1] $X^2$ – Statistics and Hausman test p-value: equality test between fixed and random effects models.

[2] Statistics and p-values of the goodness-of-fit model. In the fixed effects case corresponds to *F-Statistics*.

[3] $X^2$ –Statistics and Sargan endogeneity test p-value: equality test between ordinary least squares and instrumental variable models. Because the fixed-effect model is the resulting one, we apply Sargan test to the model with first differences.

*Investigaciones Económicas,* vol 14, núm 1*,* pp. 3-45.

BAYLESS, M. [1994]: *«*The Infkuence of Predictability on Differences in the Market Reaction to Debt and Equity Issue Announcements*». Journal of Financial Research*, vol 17 (1), pp. 117-132.

BOLTON, P AND FREIXAS, X. [2000]: «Equity, Bonds and Bank Debt: Capital Structure and Financial Market Equilibrium under Asymmetric Information*». Journal of Political Economy*, vol 108 (2), pp. 324-351.

BOOTH, J. R. [1992]: «Contract Costs, Bank Loans, and the Cross-Monitoring Hypothesis». *Journal of Financial Economics*, vol 31(1), pp. 25-41.

CAI, J; CHEUNG, L.Y. AND GOYAL, V.K.,(1.999): «Bank monitoring and the maturity structure of Japanese corporate debt issues*». Pacific Basic Finance Journal*, vol. 7 (3-4), pp. 229-250...

CHAPLINSKY, S. AND HANSEN, R. [1991]: «Partial Anticipation, the Flow of Information and the Economic Impact of Corporate Debt Sales*». Review of Financial Studies*, vol 6(3) pp. 709-732.

COVITZ, D. M. AND HEITFIELD, E. [1999]: «Monitoring, Moral Hazard, and Market Power: A Model of Bank Lending». Board of Governors of the Federal Reserve System; Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series: vol 99/37, July 1999

DATTA, S. ; ISKANDAR-DATTA, M. AND PATEL, A. [1999]: «Bank Monitoring and the Pricing of Corporate Public Debt*». Journal of Financial Economics,* vol 51, pp. 435-449.

DIAMOND, D. [1984]: «Financial Intermediation and Delegated Monitoring». *Review of Economic Studies*. núm 51, pp. 393-414.

DIAMOND, D. (1.991): «Monitoring and Reputation: The choice between bank loans and directly placed debt*». Journal of Political Economy*, 99, pp 688-721..

GONZÁLEZ, V. [1997]: «La valoración por el mercado de capitales español de la financiación bancaria y las emisiones de obligaciones*». Investigaciones Económicas,* vol 21(1), January, pp. -111-128.

HADLOCK, C.AND JAMES, C.M. [2002]: «Do banks provide financial slack?*». Journal of Finance, forthcoming.*

.

*Moneda y Crédito,* 188, pp. 177-201.

OCAÑA, C.; SALAS, V. AND VALLÉS, J. [1994]: «Un análisis empírico de la financiaicón de la pequeña y mediana empresa manufacturera española: 1983-1989 . *Moneda y Crédito, 199*, pp 57-96.

PETERSEN, M. A. AND RAJAN, R. G. [1995]: «The Effect of Credit Market Competition on Lending Relationships». *Quarterly Journal of Economics,* vol 110 (2), pp 407-443

RAJAN, R.G.. (1.992): «Insiders and Outsiders: The choice between informed and arms`-length debt». *Journal of Finance*, 47, pp. 1367-1400.

SAURINA-SALAS, J. [1997]: «Desregulacion, poder de mercado y solvencia en la banca espanola». *Investigaciones-Economicas,* vol 21, núm 1, Enero pp. 3-27.

SEGURA, J AND TOLEDO, L. [2001]: «Tamaño, estructura y coste de financiación de las empresas manufactureras españolas I Encuentro de Economía Industrial, Barcelona, September.

SHARPE, S. [1990]: «Asymmetric Information, Bank Lending and Implicit Contracts: A Stylized Model of Customer Relationships». *Journal of Finance.* vol 45(4).

WEINSTEIN, D. AND YAFEH, Y. [1998]: «On the costs of a bank centered financial system: Evidenca from the changing Main bank relations in Japan ». *Journal of Finance,* vol 53(2), April, pp 635-672. .

YOSHA, O., [1995]: «Information Disclosure Costs and and the Choice of Financingsources". *Journal of Financial Intermediation 4(1), pp. 3-20.*

ZOIDO, M. E. [1998]: «Un estudio de las participaciones accionariales de los bancos en las empresas españolas». *Investigaciones Económicas,* vol 22(3), September, pp. 427-467.