# THE EFFECTS OF BANK DEBT ON FINANCIAL STRUCTURE OF SMALL AND MEDIUM FIRMS IN SOME EUROPEAN COUNTRIES

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**The Effects of Bank Debt on Financial Structure of Small and Medium Firms in some European Countries**[*]

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## 1. - Introduction.

The competitive position of a firm could be explained by the net margin between the return on its investments and the cost of capital, which depends on its level of leverage. Therefore, the financial structure and the cost of capital are relevant, and in contrast to Modigliani and Millers' (1958) separability theorem, the financing decisions are interrelationship with the investment decisions when we assume certain imperfections in financial markets. In such imperfect markets, financial restrictions suffered by some companies could determine their investment decisions and the type of their financing.

So the competitiveness of the firms is closely interrelationship with their capital structure: A firm with financing restrictions will have difficulties to invest in profitable projects and therefore will be less competitive.

This paper analyses in depth the financial structure and the cost of debt for the companies in several EU countries, on the basis of firms' accounting information. Market imperfections, such as information asymmetries, agency relations, corporate governance mechanisms and institutional and idiosyncratic factors, could restrict the financing sources of the companies and rise their cost of debt. Moreover, the financial literature shows some differences of capital structure between small and medium-sized enterprises (SMEs) and large-scale companies. Small companies are specially affected by imperfections in financial markets, and therefore have more difficulties to obtain external funds -debt or equity- than large companies do. Given the importance of small companies in the economies, and their social value in creating jobs, it is worthwhile studying the reasons for their financial behaviour.

The capital structure and the cost of debt for the companies also differ among the countries because each country presents its own characteristics in its financial markets. Consequently, the aim of this paper is double: 1$^{st}$) to identify the financial

structure's differences by firm's size and test the variables that determine the gearing of non-financial firms in several countries, analysing the relevance of the companies' size factor in determining the total debt and the bank debt of the companies and studying the differences among the European countries, and 2nd) to test the effect of firms' size on their cost of debt in some European countries, studying the relationship between the cost of debt and some measures of business's risk. To reach both objectives we estimate three linear regression models using the **B**ank for the **A**ccounts of **C**ompanies **H**armonised (BACH) bankdata managed by the Directorate-General for Economic and Financial Affairs (ECFIN) of the European Commission.

The paper is organised as follows. Section 2 describes the theoretical framework of the investigation and makes reference to relevant previous studies. Section 3 presents an empirical approach to the financial structure of SMEs in some EU countries compared with larger companies. In particular, the third Section exposes the hypotheses to test, analyses the statistical information used, specifies the methodology applied, defines the relevant variables and then presents the econometric results about the explanatory factors determining the total debt, the bank debt and the cost of debt for the firms in several European countries. Finally, Section 4 summarises the main conclusions.

## 2. - Theory of Capital Structure of SMEs and Credit Rationing.

The traditional concept regarding the financial behaviour of companies revolved the optimal financial structure of the company and its investment decisions (Modigliani and Miller, 1958). Indeed, if all firms have equal access to capital markets firms' responses to changes in the cost of capital or tax-based investment incentives differ only because of differences in investment demand. A firm's financial structure is irrelevant to investment because external funds provide a perfect substitute for internal capital. In general, with perfect capital markets, firm's investment decisions are independent of its financial condition.

Nevertheless, certain imperfections in financial markets -such as transaction costs, bankruptcy costs, taxes, information asymmetry among various agents, and limited resources- weaken the hypothesis underlying Modigliani and Miller's theory. Investigations since the late 80's emphasise the prevalence of imperfect information in financial markets and as a direct consequence, show that some companies suffer financial restrictions (Fazzari and Athey, 1987; Fazzari et al., 1988; Mato, 1989; Estrada and Valles, 1998). According to this view, investment may depend on financial factors, such as the availability of internal funds, access to new debt or equity finance, or the functioning of particular credit market.

In particular, one of the most common imperfections in the credit market is the information asymmetry between lenders and borrowers. Generally the borrower is better informed than the lender about the future value of the project that will be undertaken. This means that the lender may restrict the borrower's use of debt because they do not know the real value of investment projects (adverse selection or pre-contractual opportunism problems, Milgrom and Roberts, 1993) and cannot be sure how the proposed funds will be applied (moral hazard or post-contractual opportunism problems, Jaffee and Russell, 1976 and Stiglitz and Weiss, 1981).

This happens especially with smaller companies, mainly because the poor quality of financial information produced by these companies. The prediction made by the theory is that an increase in uncertainty about future profit flows exacerbates informational asymmetries, and hence makes lenders reduce the flow of credit; this in turn lowers investment in credit-constrained firms (Ghosal and Loungani, 1996). In practice, the lack of confidence on the part of credit institutions results in requirements of high levels of collateral, even these guarantees are often greater than the assets available. Moreover, as in financial intermediation the price of credit may have sorting and incentive effects, banks may include higher risk premiums in the loan price that could not correctly reflect the creditworthiness of the undertaken investment (due to the asymmetric information). And higher risk premiums may increase the cost of debt for healthy borrowers and could in turn attract riskier projects. In this way, the final profitability for credit institutions of lending to smaller companies is undermined. As a

result, lenders often ration the funds available at given interest rates and only finance those projects which offer sufficient guarantees (Stiglitz and Weiss, 1981).

In addition to this, Myers and Majluf (1984) and Greenwald et al. (1984) showed that equity markets could have rationing too due to asymmetric information between external shareholders and those handling the information internally, and which can lead the market to under-value a company. This raised the issue of whether theories of credit and equity rationing could be made compatible. DeMeza and Webb (1987) integrated the various approaches and showed the following result: if there is asymmetric information about expected returns, then investors prefer debt over equity and there cannot be any credit rationing. But if there is asymmetric information about the risk, then investors prefer equity over debt and there cannot be any equity rationing. The analysis of Hellmann and Stiglitz (2000) allow for asymmetric information about both expected returns and risk: when entrepreneurs have private information about both expected returns and the risk of their projects, credit and equity rationing may occur individually or simultaneously. Moreover competition between the two markets may generate the adverse selection that leads to rationing outcomes.

Following these arguments, Myers (1984) and Myers and Majluf (1984) proposed the *pecking order theory* or financing hierarchy when choosing between funds sources to explain firm's financial structure. Because of the limited access to external finance and the greater flexibility enjoyed by firms financed by internal sources in timing their investments, firms prefer internal funds to external. And due to transaction and bankruptcy costs, asymmetric information and managerial agency considerations, debt may be more expensive than internal sources. So, when internal funds are not enough, firms prefer debt instead of equity as a source of incremental funding for their investment projects (Fazzari et al., 1988, and Myers and Majluf, 1984).

This *pecking order theory* has been specifically applied to small companies in several studies such as van-der-Wijst (1989), van-der-Wijst and Thurik (1993), Scherr et al. (1990), Holmes and Kent (1991), Ang (1991, 1992), Gibson (1992), Hernando and Valles (1992), Cosh and Hughes (1993, 1994), Berger and Udell (1995), Martín-

Rodríguez (1995), Maroto (1996), Chittenden et al. (1996), Cressy and Olofsson (1997), Johnson (1997), Hamilton and Fox (1998), Jordan et al. (1998), Winker (1999), López-Gracia and Aybar-Arias (2000). Small firms provide less and worse information to capital and credit markets about both expected returns and the risk of their projects than large firms. So the literature shows that smaller firms suffer more the financial restrictions and have less access to external capital and credit markets and, thus, should be more affected by the availability of internal funds. Moreover, smaller firms are often managed by only one director, who owns all the shares. Small firm owners prefer financing sources that minimise intrusion into their business (López-Gracia and Aybar-Arias, 2000): they finance their investment projects firstly, with personal savings and resources generated internally; secondly, with short-term debt; and thirdly, with new share issues that dilute control. Empirical evidence from panel dataset of German enterprises also suggests that the cash flow sensitivity of investment in small firms is likely to reflect financial constraints (Harhoff, 1998).

However the overall picture about the financial pecking order and about the effect of firm's cash flows on its bank debt is far from clear. Firms' cash flows can be interpreted as an accurate measure of its access to capital markets (as do Kaplan and Zingales, 1997). In these cases, signal theory justifies the bank debt of profitable firms and the positive relationship between firm's cash flows and its bank debt. Cash flows could also represent a collateral o guarantee, and it could justify the positive relationship between bank debt and cash flows. While other studies, such as Constand et al. (1991), found firm's bank debt negatively related to its profitability, suggesting again that high-retained earnings are used to lower gearing and supporting the views that there is a financial pecking order.

Moreover, following this *pecking-order theory*, firms prefer external financial sources without explicit cost (such as trade creditors), and if these funds are not enough, they use external financial sources with explicit cost (such as bank debt). The empirical literature shows that firms may be financed by their suppliers rather than by financial institutions, so bank debt and trade credits may be used as substitutes (Walker, 1991; Cosh and Hughes, 1993; Petersen and Rajan, 1994, 1996, 1997; Melle, 1997). The

differences in characteristic of firms that use bank debt and firms that use private non-bank debt suggest that, among firms lacking access to public debt markets, some may be able to substitute away from bank debt to other private debt, while others may not have this option (Johnson, 1997). Trade credit could alleviate the problem of asymmetric information between banks and firms by incorporating in the lending relation the private information held by suppliers about their customers. The empirical findings of Petersen and Rajan (1994) and Biais and Gollier (1997) evidence firms without relationships with banks resort more to trade credit, and sellers with greater ability to generate cash flows provide more trade credit. Petersen and Rajan (1997) focus on small firms whose access to capital markets may be limited and find evidence suggesting that firms use more trade credit when credit from financial institutions is unavailable. Suppliers lend to constrained firms because they have a comparative advantage in getting information about buyers, they can liquidate assets more efficiently, and they have an implicit equity stake in the firms. Finally, firms with better access to credit offer more trade credit; it suggests that firms may intermediate between institutional creditors and other firms. Moreover, the literature shows that small firms react to monetary contractions by using trade credit (Nilsen, 1994 and Hernández de Cos and Hernando, 1998).

## 3. An Empirical Approach to the Financial Structure of SMEs in some EU Countries.

### 3.1. Hypotheses to test

After this brief description of the capital structure determinants in the present theory of optimal financial structure and the theoretical aspects of the bank debt financing decision, we investigate empirically with data on European companies the determinants of their bank debt and their cost of debt. To do so, we propose and estimate three models of financial behaviour of firms: 1) a first model to identify the financial structure's differences by firm's size, using the 'ratio' total debt over total liabilities; 2) explanatory model of bank debt and 3) explanatory model of the cost of debt. Firm's size would appear to be an important factor determining all these models because size may influence debt and equity in external markets and smaller firms may suffer more financial restrictions. Smaller firms cannot access to external equity and debt market and they have to request funds to credit institutions. So in practice, banks may go on lending funds to SMEs, but may include higher risk premiums in the loan price, and therefore may increase the cost of debt for smaller borrowers. In the same sense, recent studies in monetary economics literature find small firm investment is more sensitive to fluctuations in the credit supply than is large firm investment because small firms rely more on bank debt (Johnson, 1997).

In addition to this, as it has been presented above, some studies find cash flows as one of the important factors that determines the ease with which firms can access external credit. Finally, SMEs may use trade credits as substitutive financing to bank debt.

Following these arguments, the hypotheses to test can be summarised as following:

*H1: SMEs have, in general, a higher percentage of total debt over total liabilities than large-scale companies in the European countries. However, there are some differences by countries.*

*H2: SMEs have a higher percentage of bank debt over total debt than large-scale companies in the European countries.*

*H3: The percentage of bank debt over total debt of European firms by size is different across country.*

*H4: In general, the relationship between cash flows and bank debt is positively signed for the European companies.*

*H5: There is a 'trade-off' between trade credit and bank debt for the European companies. The pecking-order theory predicts that smaller firms prefer funds without explicit cost, such as trade credit, rather than external financing.*

*H6: Banks include a high risk premium in the loan price for European SMEs, whose cost of debt is higher than the large firms is.*

*H7: The cost of debt for European firms by firm's size is different across country.*

We test these hypotheses by estimating three multiple regression models determining bank debt and the cost of debt using annual business data of European non-financial firms from 1990 to 1997. The first model allows us to contrast the first hypothesis, the second one the four following hypotheses and the last model the sixth and the seventh hypotheses.

### 3.2. Data base and sample.

The database applied has been the companies' data available in the **B**ank for the **A**ccounts of **C**ompanies **H**armonised (BACH). The Directorate-General for Economic and Financial Affairs (ECFIN) of the European Commission began in 1985 to build up a databank for the annual accounts (database BACH), aggregated at various sectoral levels, of a number of Community countries and of Japan and the United States. The aim was to analyse the structures and performances of the non-financial companies in those various countries.

The European file BACH is the result of a close co-operation between both the European Commission that manages the file and the members of the European Committee of Central Balance-sheet data offices who deliver aggregated data. The work carried out by the commission's departments was therefore concerned mainly with the harmonisation of the data made available by the different national bodies in a variety of forms. However, it has not been possible to harmonise the data fully owing to the special characteristics of the national accounting methodologies and the difficulty of drawing up accounting documents a *posteriori* using a common layout.

The BACH databank currently provides comparable data on the annual accounts of non-financial companies in thirteen countries (Germany, Finland, France, Italy, Spain, Belgium, the Netherlands, Portugal, Austria, Denmark, Sweden, the United States and Japan), broken down by major activity sector and by size, for the period from 1980 to 1998[1]. These data can be used as a basis for a whole series of comparative analyses of the financial structures of companies by country, sector, size or year.

The activity groups (industry sectors) are the result of the aggregation of the sectoral data supplied by each country and compiled on the basis of the old or the new NACE nomenclature. While some countries are still using the old European

[1] However, there is a huge heterogeneity among the available series in each country, as well as among economic sectors and company sizes (for instance, Denmark's data are only until 1992 and referred to large companies, and Finnish data could only be broken down by size for 1995-1997 period).

nomenclature, others have already adopted the new classification. The existence in BACH of sectoral data compiled on the basis of one or the other nomenclature therefore limits the available groupings to the few major sectors that are identically defined in both classifications. This list of sectors included in BACH and their definition are set out in a table in the Annex 1.

In general a distinction by size is made between three categories of companies except the US where only two size classes are available. For European countries, the size breaks down as following:

1. small companies with a turnover of less than 7 million Euro,
2. medium-size companies with a turnover between 7 million Euro and 40 million Euro, and
3. large companies with turnover in excess of Euro 40 million.

The main goal of the mutual harmonisation work of Working Group II of the European Committee of Central Balance Sheet Data Offices and ECFIN is therefore to eliminate differences as far as possible and to identify remaining differences and to provide tools for their appropriate interpretation in financial analysis. However, harmonisation of BACH data is not complete; the observed differences in the comparison of different national data sets result from methodological, economic or institutional inhomogenities. In contrast to most other statistical databases, BACH provides the information necessary to analyse the remaining methodological differences and to decide whether an item could be compared or not. On the other hand, the differences in the general business context and conditions of enterprises cannot be excluded from the data, but must be controlled for by interpretation of the results.

Because these harmonisation's difficulties, only eight European countries could be included in the models and with a different number of observations (firms' groupings by sector and size) in each country. These countries are Italy, Spain, Germany, Belgium, France, Austria, Portugal and Denmark. In some countries, for each year up to 66 observations could be considered (23 firms' groupings by sector plus 3 firms' groupings by size). But in others there are only available data for 18 groupings by sector (such as

Germany). In other countries, such as the Netherlands, Sweden and Finland, data from some groupings by firms' size (mainly small-sized and large-scale ones), industry sector or year are lacking.

The financial and economic magnitudes of firms' balance sheets in each country also confirm the BACH heterogeneity. Firms from some countries present balance sheet structures with complete and broken down accounting data, but firms from others countries inform with a lower level of data detail. This lack of relevant information reduces also the number of analysed countries in our empirical study.

To sum up, Table 1 includes detailed information about the available samples of each country: time period, number of firms, industry sectors and the business-sized groupings. To avoid substantial comparison problems the study has been restricted to those countries where the observed inconsistencies are less important.

TABLE 1
CHARACTERISTICS OF THE COUNTRIES' SAMPLES

| **SAMPLES** | **Period** | **Num. of firms (Year)** | **Sectors** | **Firms' groupings by business size** |
|---|---|---|---|---|
| AUSTRIA | 1980-1998 | 6,890 (1992) | 23 (Not for all aggregates) | 3 (Except for some sectors) |
| BELGIUM | 1989-1998 | 175,150 (1997) | 23 | 3 |
| DENMARK | 1995-1998 (Since 1983 manufacturing industries) | 5,000 (1997) | 15 | 3 |
| FRANCE | 1984-1998 | 33,132 (1995) | 23 | 3 |
| GERMANY | 1987-1997 | 47,612 (1996) | 18 | 3 |
| ITALY | 1982-1998 | 40,000 (1998) 34,991 (1991) | 23 | 3 |
| NETHERLANDS | 1983-1998 | 160,500 | 20 or 21 According to business size | 3 (Except for some sectors) |
| PORTUGAL | 1990-1998 | 25,085 (1998) | 18 | 3 |
| SPAIN | 1983-1997 | 7,500 (1997) | 23 | 3 |
| SWEDEN | 1991-1996 | 265,800 (1996) | 23 | 3 |

*Source*: BACH (European Commission, 2000), with additional remarks.

### 3.3. Methodology applied and definition of the variables

The methodology used to contrast the proposed hypothesis consists of the estimation of three multiple linear regression models to explain the financial behaviour of SMEs in several countries of Europe. Models have been estimated by the Ordinary Least Squares (OLS) method.

1) The first model tries to determine the effects of firm's size on the percentage of total debt over total liabilities in some European companies. The dependent variable is measured by 'total debt over total liabilities of firms grouping i in year t' ($y_{it}$). The independent variables are the followings:

(i) Three sizes' dummy variables: SIZEONE, SIZETWO and SIZETHREE.

SIZEONE is equal to one if the firms' grouping is composed by small-sized firms and equal to zero otherwise.

SIZETWO is equal to one if the firms' grouping is composed by medium-sized firms and equal to zero otherwise.

SIZETHREE is equal to one if the firms' grouping is composed by large-scale firms and equal to zero otherwise.

(ii) Ten countries' dummy variables: DENMARK, NETHERLANDS, PORTUGAL, SWEDEN, ITALY, SPAIN, GERMANY, BELGIUM, FRANCE and AUSTRIA. Each variable is equal to one if the firms' grouping is from this country and equal to zero otherwise.

(iii) Nineteen year's dummy variables ($z_t$) reflect temporal effects for the time period considered in each case. Each time variable is equal to one if the data belong to this year and equal to zero otherwise.

Therefore the estimated model for the data pooling is defined as following:

$$y_{it} = c_i + \beta_1 SIZEONE_{it} + \beta_2 SIZETWO_{it} + \beta_3 SIZETHREE_{it} + \beta_4 DENMARK_{it} +$$
$$+ \beta_5 NETHERLAND_{it} + \beta_6 ITALY_{it} + \beta_7 SPAIN_{it} + \beta_8 GERMANY_{it} + \beta_9 BELGIUM_{it} +$$
$$+ \beta_{10} FRANCE_{it} + \beta_{11} AUSTRIA_{it} + \beta_{12} PORTUGAL_{it} + \beta_{13} SWEDEN_{it} +$$
$$+ \lambda_1 z_1 + \lambda_2 z_2 + ... + \lambda_T z_t + \varepsilon_{it} \qquad i = 1,...,n \qquad t = 1,...,T$$

where n is the number of firms' groupings and T is the number of years. To prevent perfect multicolinearity in the estimations of $\beta$ coefficients, there are only introduced two size's dummy variables, nine country's variables and T-1 year's dummy variables. Later, the model is 'reconstructed' with the calculation of the structural coefficients assuming the following restrictions:

$$\beta_1 + \beta_2 + \beta_3 = 0$$
$$\beta_4 + \beta_5 + \beta_6 + \beta_7 + \beta_8 + \beta_9 + \beta_{10} + \beta_{11} + \beta_{12} + \beta_{13} = 0$$
$$\lambda_1 + \lambda_2 + ... + \lambda_{T-1} + \lambda_T = 0$$

2) The second model determines the explanatory factors of firms' bank debt, and includes firm's size as independent variable. The dependent variable 'total bank debt over total debt of firms grouping i in year t' ($y_{it}$) is determined by the following independent variables[2]:

(i) Three size's dummy variables: SIZEONE , SIZETWO and SIZETHREE, defined as in the first model.

(ii) CASHFLOW: (Net operating profit + Depreciation on fixed assets)/Total assets.

(iii) TRADECRED: Trade creditors/Total liabilities

(iv) Six country's dummy variables: ITALY, SPAIN, GERMANY, BELGIUM, FRANCE and AUSTRIA. Each variable is equal to one if the firms grouping is from this country and equal to zero otherwise.

(v) T year's dummy variables ($z_t$) reflect temporal effects for the time period considered. Each time variable is equal to one if the data belong to this year and equal to zero otherwise.

According to the independent variables defined above, the model to estimate is:

$$y_{it} = c_i + \beta_1 SIZEONE_{it} + \beta_2 SIZETWO_{it} + \beta_3 SIZETHREE_{it} + \beta_4 CASHFLOW_{it} -$$
$$- \beta_5 TRADECRED_{it} + \beta_6 ITALY_{it} + \beta_7 SPAIN_{it} + \beta_8 GERMANY_{it} + \beta_9 BELGIUM_{it} +$$
$$+ \beta_{10} FRANCE_{it} + \beta_{11} AUSTRIA_{it} + \lambda_1 z_1 + \lambda_2 z_2 + ... + \lambda_T z_t + \varepsilon_{it}$$
$$i = 1,...,n \qquad t = 1,...,T$$

where n is the number of firms' groupings and T is the number of years (seven in this case). Firstly, to prevent perfect multicolinearity in the estimations of $\beta$ coefficients, there are only introduced two size' dummy variables, five country's dummy variables and T-1 year's dummy variables. Later, the model is 'reconstructed' with the calculation of the structural coefficients assuming the following restrictions:

$$\beta_1 + \beta_2 + \beta_3 = 0$$
$$\beta_6 + \beta_7 + \beta_8 + \beta_9 + \beta_{10} + \beta_{11} = 0$$
$$\lambda_1 + \lambda_2 + ... + \lambda_{T-1} + \lambda_T = 0$$

The estimation of this model for each year (suppressing the year's dummies) allow us to know the evolution of bank debt of European firms by firm's size and country, through the evolution of the structural coefficients of both dummy variables (SIZE and COUNTRY). The $\beta$ coefficients of CASHFLOW and TRADECRED estimated in the model for each year show the evolution of the effects of both variables on bank debt of European firms.

On the other hand, the estimation of this model for each country (suppressing the country's dummies) allow us to demonstrate the differences of bank debt among the European firms by firm's size, through the structural coefficients of size's dummies

[2] To eliminate substantial comparison problems among countries the variables are defined by alternative

estimated in the model for each country. The coefficients of CASHFLOW and TRADECRED estimated in the model for each country show the different effects of both variables on bank debt across countries.

3) The third model investigates the size's effect on the cost of debt for the European companies. Across countries, firms have a different financial behaviour according to the firm's size. Therefore this model is estimated for each country. It shows the different size's effect on the cost of debt across the following countries analysed: Italy, Spain, Austria, Portugal, Belgium, France and Denmark.

The dependent variable is defined as: 'Interest and similar charges over total debt with explicit cost of firms grouping i in year t' ($y_{it}$). The independent variables included in this model are:

(iv) Three size's dummy variables: SIZEONE , SIZETWO and SIZETHREE, defined as in the first model.

(v) T year's dummy variables ($z_t$) reflect temporal effects for the time period considered. Each time variable is equal to one if the data belong to this year and equal to zero otherwise.

Therefore the estimated model for each country is defined as following:

$$y_{it} = c_i + \beta_1 SIZEONE_{it} + \beta_2 SIZETWO_{it} + \beta_3 SIZETHREE_{it} + \lambda_1 z_1 + \lambda_2 z_2 + \\ + ... + \lambda_T z_t + \varepsilon_{it} \qquad i = 1,...,n \qquad t = 1,...,T$$

where n is the number of firms' groupings and T is the number of years. To prevent perfect multicolinearity in the estimations of $\beta$ coefficients, there are only introduced two size's dummy variables and T-1 year's dummy variables. Later, the structural

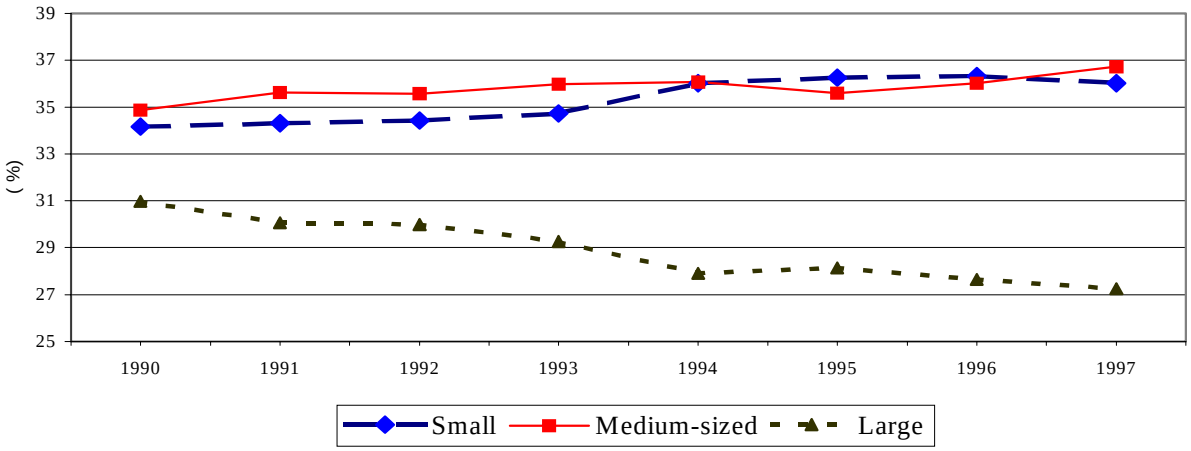
ratios, which are less affected by inhomogenities.

coefficients of the size's dummies are calculated assuming the restriction $\beta_1 + \beta_2 + \beta_3 = 0$.

### 3.4. Explanatory factors determining the bank debt of European companies.

A first descriptive analysis for all European companies -from Germany, Austria, Spain, France, Italy and Belgium- shows the evolution of the weight of the bank debt over total debt (measured by medium values) of each firms' grouping by size regarding the total. As Graph 1 presents, in general, the European SMEs finance their investments using more bank debt than the European large-scale firms. Bank debt of the European SMEs has been slightly increased since 1990, and both firms' groupings by size present a very similar financial behaviour. Bank debt over total debt of the European large companies regarding to all sizes of companies is minor and tends to decrease over the time.

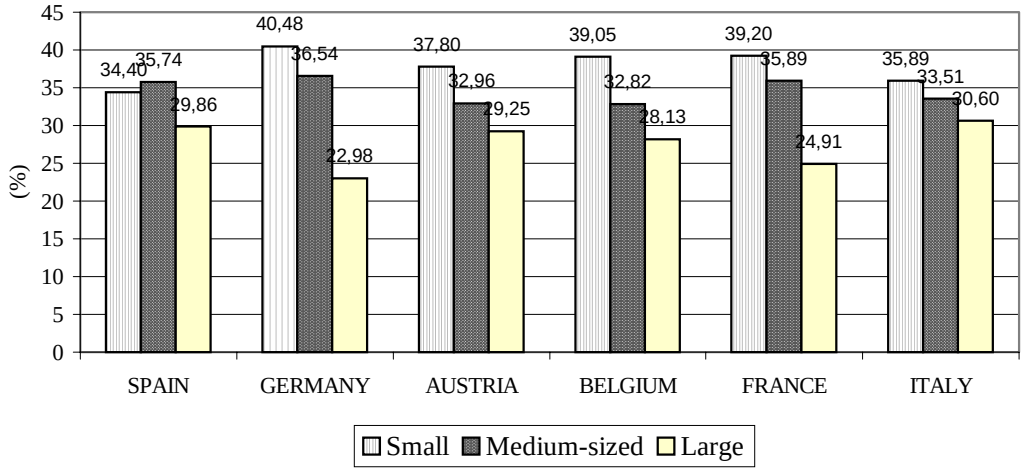
GRAPH 1: Evolution of the weight of bank debt over total debt for European companies by firm's size (medium values)




*Source*: Own estimations based on BACH database.

Graph 2 shows the same descriptive analysis by country. The weight of bank debt over total debt (measured by medium values) of SMEs' groupings is higher than the weight of bank debt over total debt of the large firms' groupings in Germany, Austria, Spain, France, Italy and Belgium.

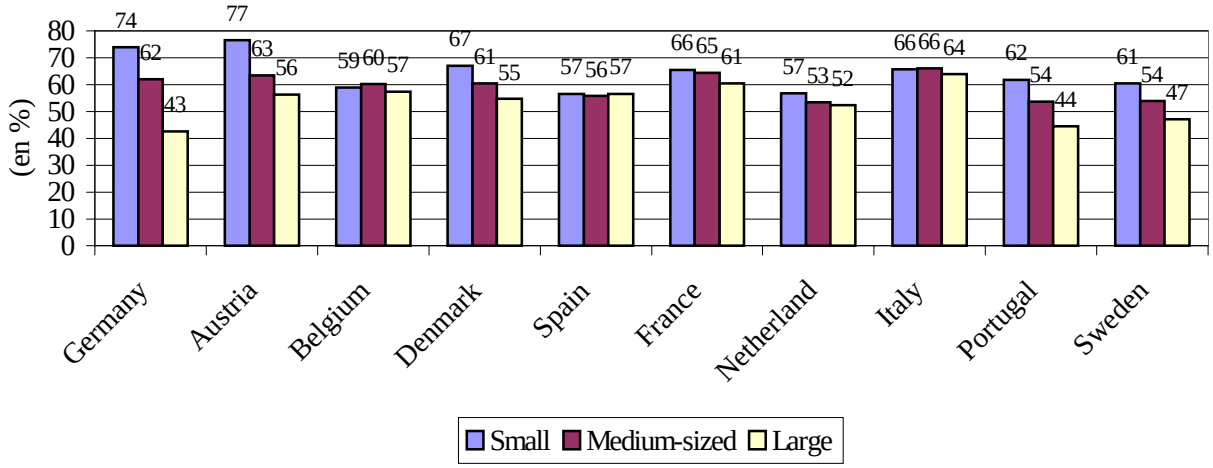
GRAPH 2: Weight of bank debt over total debt for European companies by firm's size (medium values). Information detailed by countries.




*Source*: Own estimations based on BACH database.

Graph 3 presents a descriptive analysis of the total debt over total liabilities, also by country. The medium values of this 'ratio' show that, in general, European SMEs have a higher amount of total debt than the European large companies. However, these differences in the percentages of total debt by the firms' size are not equally significant in every country. For instance, the groupings by sizes of Spanish, Belgium and Italian companies present more or less the same percentages of total debt over total liabilities. The high weight of SMEs in these countries and their common specialisation in services sector could explain it.

GRAPH 3: Evolution of the weight of total debt over total liabilities for European companies by firm's size (medium values)




*Source*: Own estimations based on BACH database.

The regression model to explain the percentage of total debt over total liabilities verifies the hypothesis 1 (H1) about the minor total debt in the European large companies, in general. The country's effects measured by country dummies present significant t-Statistics. So there are relevant differences by countries. Table 2 shows the results of this estimated model using all data pool since 1980 to 1998. The size's dummy variables are statistically significant.

TABLE 2: Regression model determining total debt

| Dependent Variable: TOTAL DEBT/TOTAL LIABILITIES<br>Method: Ordinary Least Squares<br>Included observations: 7376 | | | |
|---|---|---|---|
| **Variable** | **Coefficient** | **t-Statistic** | **Structural Coefficient** |
| **C** | 57.85516 | 89.09434 | 57.85516 |
| **SIZEONE** | 9.617124 | 32.95200 | 4.723959 |
| **SIZETWO** | 5.062370 | 17.49577 | 0.169205 |
| **SIZETHREE** | - | - | -4.893165 |
| **SWEDEN** | -10,77512 | -17.60880 | -5,241656 |
| **DENMARK** | -4,056026 | -7.943630 | 1,477437 |
| **NETERLANDS** | -9,628659 | -15.34709 | -4,095196 |
| **PORTUGAL** | -10,79337 | -17.95308 | -5,259907 |
| **SPAIN** | -8,642343 | -19.14424 | -3,108880 |
| **FRANCE** | -1,314347 | -2.807459 | 4,219116 |
| **ITALY** | 0,459698 | 1.057251 | 5,993161 |
| **BELGIUM** | -5,524544 | -10.65243 | 0,008919 |
| **GERMANY** | -5,05992 | -9.499534 | 0,473543 |
| **AUSTRIA** | - | - | 5,533463 |
| **1980** | 4,835508 | 3,089838 | 2,387581 |
| **1981** | 6,500603 | 4,153971 | 4,052676 |
| **1982** | 2,759498 | 2,532100 | 0,311571 |
| **1983** | 2,732861 | 3,093229 | 0,284934 |
| **1984** | 3,707727 | 4,444191 | 1,259800 |
| **1985** | 3,431408 | 4,125027 | 0,983481 |
| **1986** | 2,150084 | 2,587006 | -0,297843 |
| **1987** | 1,617255 | 2,041739 | -0,830672 |
| **1988** | 1,834129 | 2,320593 | -0,613798 |
| **1989** | 2,741984 | 3,703477 | 0,294057 |
| **1990** | 2,551940 | 3,528509 | 0,104013 |
| **1991** | 2,681163 | 3,803020 | 0,233236 |
| **1992** | 2,232820 | 3,165927 | -0,215107 |
| **1993** | 2,183405 | 3,182069 | -0,264522 |
| **1994** | 1,720382 | 2,511056 | -0,727545 |
| **1995** | 1,532677 | 2,244107 | -0,915250 |
| **1996** | 0,835103 | 1,224738 | -1,612824 |
| **1997** | 0,462068 | 0,661100 | -1,985859 |
| **1998** | - | - | -2,447927 |
| **R-squared** | | 0.253583 | |
| **Adjusted R-squared** | | 0.250636 | |
| **S.E. of regression** | | 10.12168 | |

*Source*: Own estimations based on BACH database.

The regression model of explanatory factors determining the bank debt reaches the same conclusions about the effect of firm's size on bank debt, testing favourably the hypothesis 2 (H2). Table 3 shows the results of the estimated model using all data pool since 1980 to 1998. The size's dummy variables are statistically significant. Trade credits and cash flows are also significant and present the expected sign (negative for

the first variable and positive for the second one) –it tests favourably the hypotheses 4 and 5 (H4 and H5)-.

TABLE 3: Regression model determining bank debt

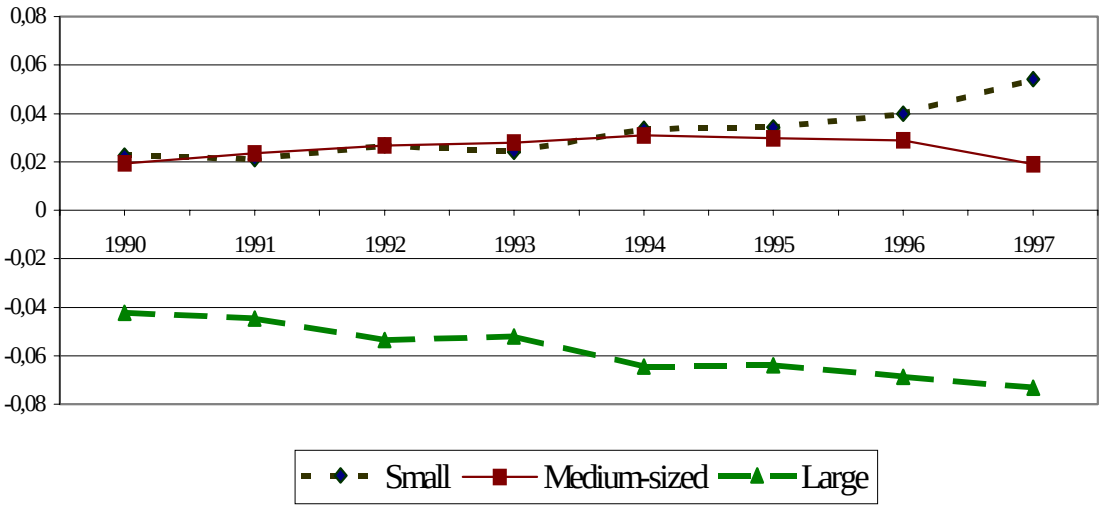
| Dependent Variable: TOTAL BANK DEBT/TOTAL DEBT<br>Method: Ordinary Least Squares<br>Included observations: 5491 | | | |
|---|---|---|---|
| **Variable** | **Coefficient** | **t-Statistic** | **Structural Coefficient** |
| **C** | 0.354608 | 44.75817 | 0.354608 |
| **SIZEONE** | 0.062897 | 20.22508 | 0.017737 |
| **SIZETWO** | 0.072581 | 23.51854 | 0.027422 |
| **SIZETHREE** | - | - | -0.045159 |
| **CASHFLOW** | 0.002062 | 5.455981 | 0.002062 |
| **TRADECRED** | -0.004486 | -28.45452 | -0.004486 |
| **SPAIN** | 0.030795 | 7.366109 | 0.060987 |
| **FRANCE** | -0.113903 | -25.71338 | -0.083711 |
| **ITALY** | 0.034334 | 8.157746 | 0.064526 |
| **BELGIUM** | -0.081942 | -17.23115 | -0.051750 |
| **GERMANY** | -0.050434 | -10.47493 | -0.020242 |
| **AUSTRIA** | - | - | 0.030192 |
| **1980** | 0.040978 | 2.835425 | 0.0224180 |
| **1981** | 0.053056 | 3.674230 | 0.0344960 |
| **1982** | 0.027818 | 2.712072 | 0.0092580 |
| **1983** | 0.037401 | 4.168795 | 0.0188410 |
| **1984** | 0.039651 | 4.712107 | 0.0210910 |
| **1985** | 0.034724 | 4.136697 | 0.0161640 |
| **1986** | 0.014506 | 1.727458 | -0.0040539 |
| **1987** | 0.006029 | 0.754414 | -0.0125309 |
| **1988** | -0.002239 | -0.280551 | -0.0207989 |
| **1989** | 0.014207 | 1.907070 | -0.0043529 |
| **1990** | 0.016926 | 2.277512 | -0.0016339 |
| **1991** | 0.018507 | 2.493584 | -0.0000529 |
| **1992** | 0.027514 | 3.706933 | 0.0089541 |
| **1993** | 0.016776 | 2.257428 | -0.0017839 |
| **1994** | 0.006061 | 0.816524 | -0.0124989 |
| **1995** | 0.004020 | 0.542151 | -0.0145399 |
| **1996** | -0.000177 | -0.023930 | -0.0187369 |
| **1997** | -0.003119 | -0.415866 | -0.0216789 |
| **1998** | - | - | -0.0185599 |
| **R-squared** | | 0.401011 | |
| **Adjusted R-squared** | | 0.398050 | |
| **S.E. of regression** | | 0.091100 | |

*Source*: Own estimations based on BACH database.

Through the estimation of this model for each year (from 1990 to 1997), it is possible to present the evolution of the structural coefficients of both size's and country's dummies (Graphs 4 and 5). The evolution of the $\beta$ coefficients of size's dummies evidences a positive and slightly upward effect of the SMEs' dummies on the

bank debt and a negative and decreasing effect of the large companies on the bank debt (Graph 4). The Annex 2 shows the results of the estimated coefficients for each year.

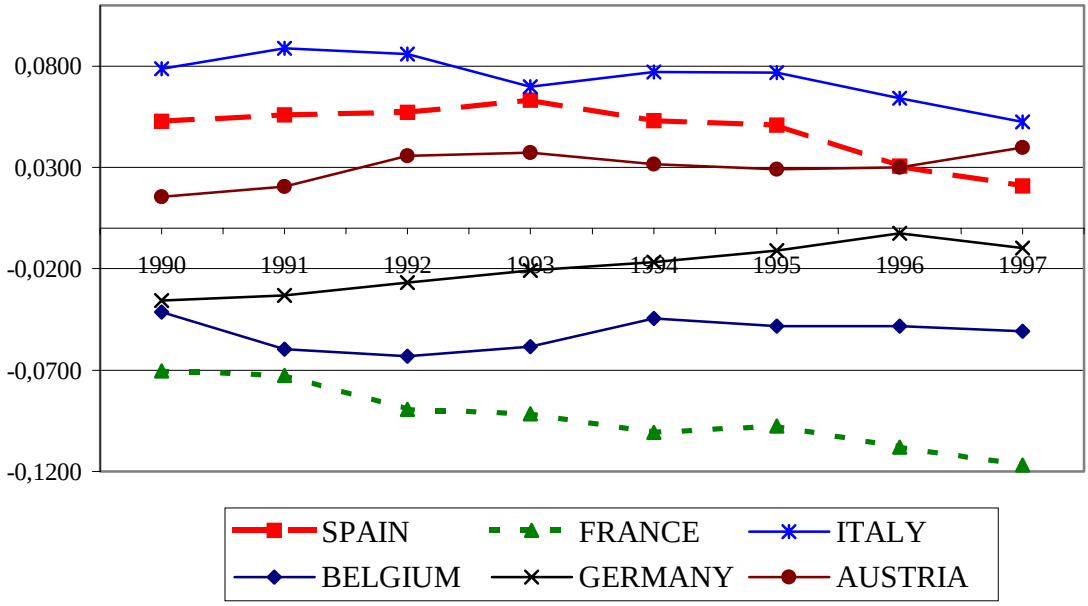
GRAPH 4: Evolution of bank debt for European companies by firm's size
(Evolution of the structural coefficients of size's dummies)




*Source*: Own estimations based on BACH database.

On the other hand, the evolution of the coefficients of country's dummies tests favourably the hypothesis 3 (H3) about the differences among the bank debt of European companies across country. As Graph 5 shows, the Austrian, Spanish and Italian companies have more bank debt than German, Belgian and French companies do. The characteristic industrial structure of each country could explain these differences. In fact, there is a relationship between size and sector factors that could affect to the estimated coefficients and could justify some differences among countries that have their peculiar industrial structure and their characteristic firms.

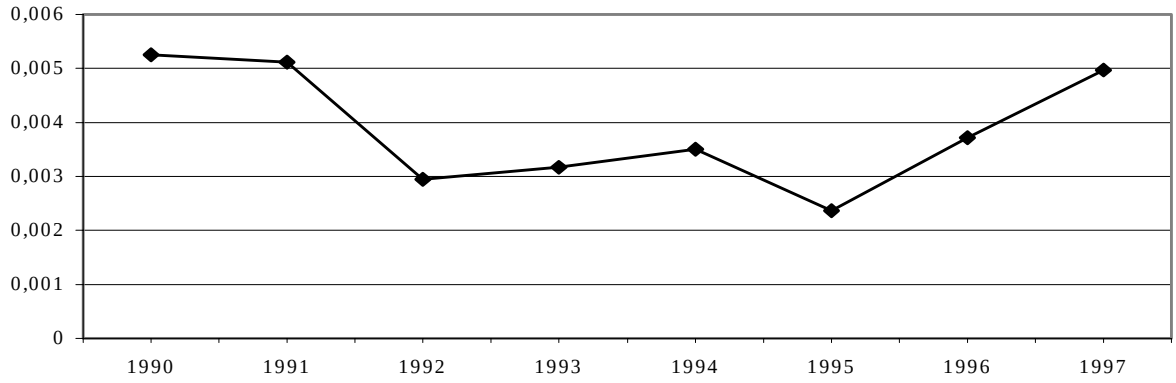
GRAPH 5: Evolution of Bank debt for European companies by country
(Evolution of the structural coefficients of country's dummies)




*Source*: Own estimations based on BACH database.

The coefficients of the variables CASHFLOW and TRADECRED have been also estimated for each year. They show the evolution of the effects of both independent variables on bank debt of European firms. Graph 6 shows the positive effect of 'Cash flows' on bank debt because firms that generate internally cash flows provide more guarantees to credit institutions on the refund of their loans (H4).

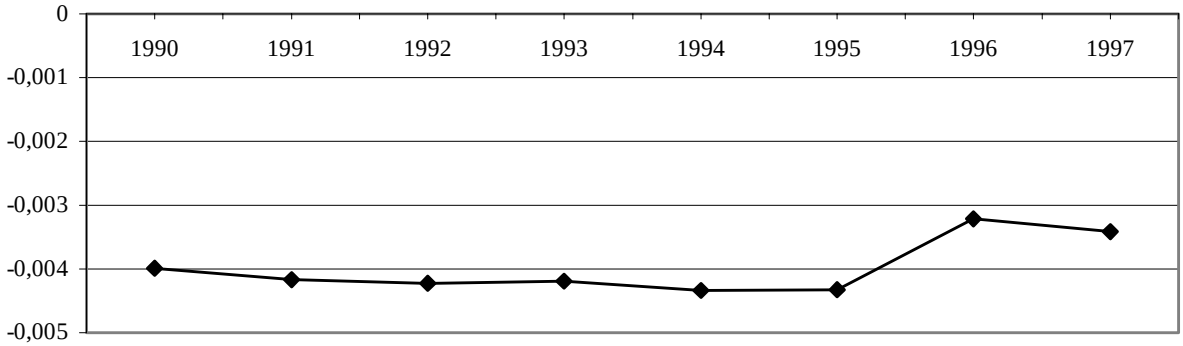
GRAPH 6: Evolution of the effects of 'Cash Flows/Total Assets' on bank debt for European firms (Evolution of the coefficients)




*Source*: Own estimations based on BACH database.

Graph 7 presents the negative effect of 'Trade credits' on bank debt for the European companies. Therefore in general, as the empirical literature shows, European firms may be financed by their suppliers rather than by financial institutions, so bank debt and trade credits may be used as substitutes (H5).

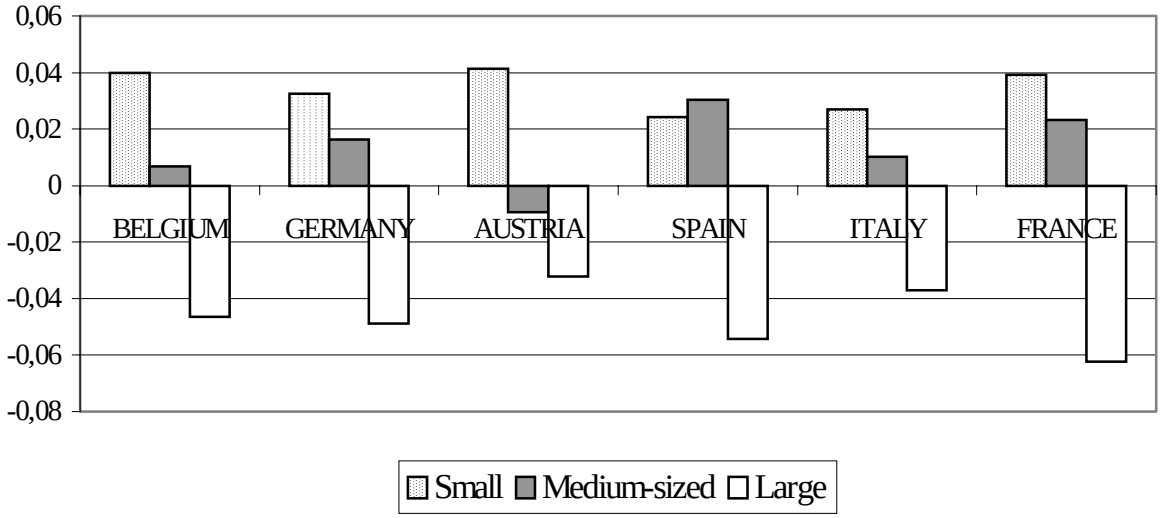
GRAPH 7: Evolution of the effects of 'Trade credits/Total Assets' on bank debt for European firms (Evolution of the coefficients)




*Source*: Own estimations based on BACH database.

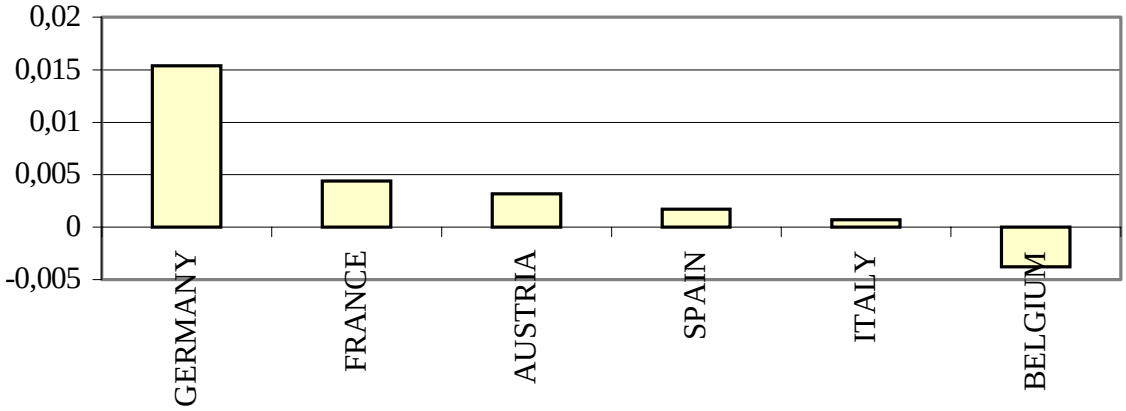
The hypothesis 3 (H3) on the differences among bank debt of European companies across countries can be tested also through the estimation of the model for each country (suppressing the country's dummies). The estimated coefficients of these models by country are detailed in the Annex 3. Graph 8 shows the different coefficients of size's dummies in each country that verifies their different firms' structures. Graph 9 evidences different effect of 'Cash flow' on bank debt across countries. The relationship between both variables is positive for all countries except for Belgium, where the cash flow generated by firms is used as substitute financing to bank debt and not as collateral. The high weights of the institutional investors, former public and specialised banks in this country maybe justify, at least in part, this different behaviour. Finally, Graph 10 demonstrates also different effect of 'Trade credits' on bank debt in each European country. In fact, German companies use trade credits as complementary funds to bank debt. In Germany, banks hold a strong relationship with some industrial sectors and firms, financing them, participating in their capital and even actively in their management. So banks value positively firms that keep stable relationships with their suppliers, and could increase the loans to these companies.

GRAPH 8. Bank debt of European companies by firm's size. Information detailed by countries (coefficients of size's dummies in each country)



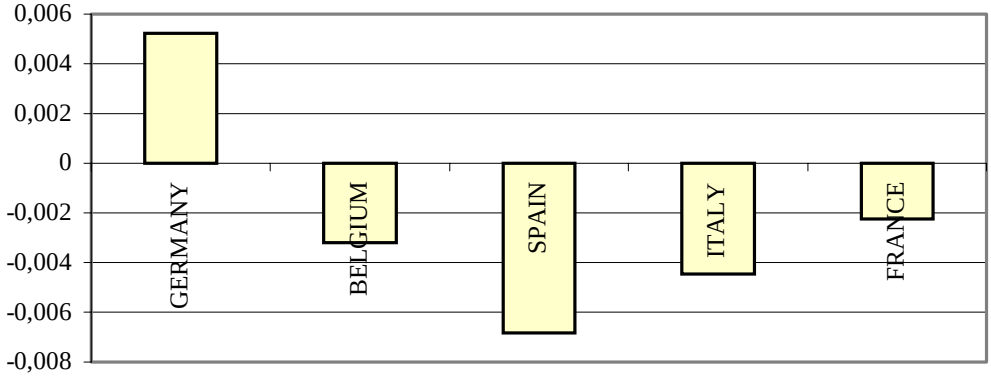

*Source*: Own estimations based on BACH database.

GRAPH 9: Effect of 'Cash flows/Total Assets' on bank debt across countries ($\beta$ coefficient of this variable in each model)




*Source*: Own estimations based on BACH database.

GRAPH 10: Effect of 'Trade credits/Total Assets' on bank debt across countries ($\beta$ coefficient of this variable in each model)




*Source*: Own estimations based on BACH database.

### 3.5. Explanatory factors determining the cost of debt.

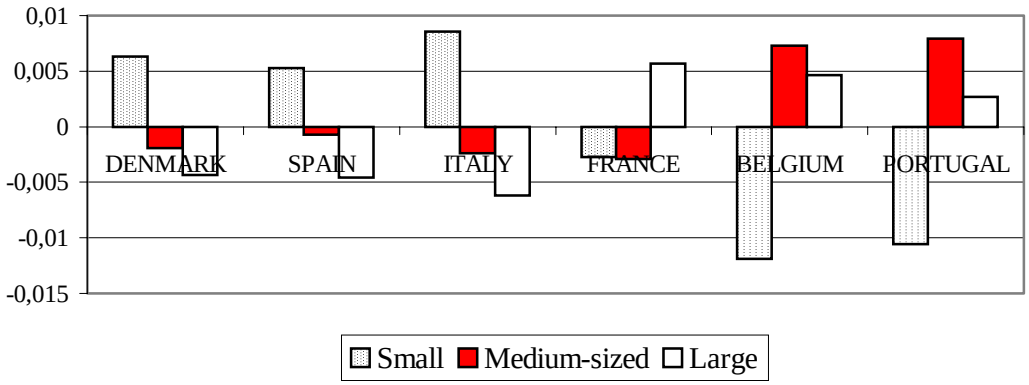
The hypothesis 6 (H6) on the high risk premium included by banks in the loan price for the European SMEs is tested favourably in some European countries and negatively in others. It confirms the different financial systems that still exist in the EU and the different cost of debt for European firms by firm's size across country (H6). In Spain, Italy and Denmark the hypothesis 6 is verified because the firms' cost of debt is positively relationship with the small-sized dummy (Graph 11 shows the different coefficients of size's dummies in each country and the Annex 4 details the estimated coefficients for each country's model). So some financial intermediaries use to charge high risk premiums to smaller firms. It could be because they do not have enough information about the creditworthiness of the undertaken investment and they believe that their business-risk will be higher. This happens especially in Spain and Italy where banks include a 'risk premium' in the loan price that does not correctly reflect the creditworthiness of the undertaken investment. While in Denmark the higher cost of debt for smaller firms is accordance to their higher leverages and economic risks.

Both the adequacy of the supply of debt finance to small firms and the contractual conditions attaching to it could be seen as a major constraint on the development of the small firm sector in these countries. In this regard, the main banks from these countries could be identified as the main culprits and could be criticized for being too 'risk-adverse', particularly in relation to the financial needs of rapidly growing small firms.

Although the traditional wisdom about the cost of borrowed funds by firm scale has been that the cost of such funds is much greater for small firms than for large, Beason (1992) accounts for the impact of compensating balances in calculating effective interest rates paid by firms of different size in Japan and finds that the process determining interest rates for the two sizes of firms does differ, but that there has been much convergence recently. In our empirical analysis, French, Belgian and Portuguese smaller firms have a lower cost of debt than the large firms do. It could be also

explained because the database used for these countries is biased to large-scale companies. On the other hand, their financial systems try to benefit and support their industrial sectors, so they try also to charge a premium on the cost of external funds according to the 'real' business-risk of the firm rather than to the firm's size. In this sense, the theoretical and empirical literature suggests that the perception of a finance gap and other contractual conflicts between banks and small firms can be more adequately explained in terms of the differences in the economic functions, relative risks, payoffs and, therefore, the economic interests of the suppliers of equity and debt finance (Keasey and Watson, 1994).

GRAPH 11: Cost of debt for European firms by firm's size across country (coefficients of size's dummies in each country




*Source*: Own estimations based on BACH database.

As a first approach to this question, Table 4 shows the values of some variables that indicate the economic and financial risks of European companies and their average cost of debt by firm's size. The economic risk is measured by the standard deviation of the return on investments and the financial risk is measured by the medium value of the leverage –it is debt over equity-. In Spain and Italy, SMEs' groupings present less economic and financial risks than larger firms' groupings do, and however the average cost of debt is higher for SMEs than for large firms. Therefore, in both countries, probably due to informational asymmetries, banks may not consider the capacity of the

firms to generate cash flows neither their level of leverage as indicator of their financial solvency, when they decide about lending funds to companies.

On the other hand, Danish SMEs have higher economic and financial risks than Danish large firms, as well as higher average cost of debt. So the higher cost of debt for smaller firms is accordance to their higher leverages and economic risks.

TABLE 4: Economic and financial risks and cost of debt

| | **Economic Risk σ (ROI)** | **Financial Risk Leverage=D/S** | **Cost of debt (Medium values)** |
|---|---|---|---|
| **ITALY** | | | |
| Small firms | 2.416491 | 2.625884 | 0.125568 |
| Medium-size firms | 2.028789 | 2.720093 | 0.111451 |
| Large firms | 2.919177 | 3.330380 | 0.104072 |
| **SPAIN** | | | |
| Small firms | 2.68148 | 1.417206 | 0.118685 |
| Medium-size firms | 3.128956 | 1.566400 | 0.115986 |
| Large firms | 4.916454 | 1.793727 | 0.115357 |
| **DENMARK** | | | |
| Small firms | 4.701362 | 2.433320 | 0.068139 |
| Medium-size firms | 2.84379 | 1.887592 | 0.060042 |
| Large firms | 3.51268 | 1.715204 | 0.057783 |
| **FRANCE** | | | |
| Small firms | 2.360933 | 2.292487 | 0.083347 |
| Medium-size firms | 2.487272 | 2.484186 | 0.081954 |
| Large firms | 2.426639 | 2.297366 | 0.083982 |
| **BELGIUM** | | | |
| Small firms | 1.999157 | 1.763696 | 0.080603 |
| Medium-size firms | 1.970388 | 1.871138 | 0.099960 |
| Large firms | 1.978688 | 1.795951 | 0.097979 |
| **PORTUGAL** | | | |
| Small firms | 4.274112 | 2.150510 | 0.123141 |
| Medium-size firms | 2.75556 | 1.457291 | 0.141307 |
| Large firms | 4.111066 | 1.079163 | 0.134367 |

ROI: Return On Investments. D: Debt. S: Stocks.
Cost of debt = Interest charges paid on financial debts/Debt

*Source*: Own estimations based on BACH database.

In France, the medium-size firms have lower average cost of debt than the large and small firms do, but they have, however, the highest economic and financial risks. The average cost of debt for Belgian companies is positive relationship with their

financial risk. Finally, Portuguese small companies have the highest economic and financial risks but however the lowest average cost of debt. So definitely it is difficult to find a general relationship between business-risk and cost of debt by firm's size for European companies. Anyway there are informational asymmetries in the credit market that make difficult for banks to know exactly the business-risk and charge the correct risk premium.

## 4. Conclusions.

This study analyses in depth the financial structure and the cost of debt for the companies in several EU countries, on the basis of firms' accounting information. So the aim of this paper consists of: 1st) testing the variables that determine the total debt and the bank debt of non-financial firms in several European countries, analysing the relevance of the size factor and the differences across country, and 2nd) testing the effect of firms' size on their cost of debt in some European countries, studying the relationship between the cost of debt and some measures of business-risk.

The main conclusions of this study can be summarised as the following:

i) European large companies present, in general, minor percentages of total debt over total liabilities. However there are relevant differences by countries.

ii) The firm's size affects to the bank debt of the European companies. The relationship between size and bank debt is negatively signed: Smaller firms have more bank debt in their financial structure than large firms do.

iii) The weight of bank debt over total debt for the European companies analysed in this study is different by country: Austrian, Spanish and Italian companies, in general, have more bank debt in their financial structure than German, Belgium and French companies do.

iv) For the BACH database, it is verified a positive effect of 'Cash flows' on bank debt of European firms because firms that generate internally cash

flows provide more guarantees to credit institutions on the refund of their loans. And also it is verified the negative effect of trade credits on bank debt because both financing resources may be used as substitutes by European firms. However, the effects of these independent variables on bank debt are different in each European country.

v) The cost of debt is positively relationship with the small-sized dummy for Spanish, Italian, Danes, and slightly French companies. While, Belgian and Portuguese smaller firms have a lower cost of debt than the large firms do. However, European SMEs do not always present the highest economic and financial risks. The results suggests the perception that in Spain, Italy and Portugal there is a finance gap and other contractual conflicts of adverse selection between banks and small firms. However, in other countries, such as Denmark, France and Belgium, banks include a 'risk premium' in the loan price that reflect more appropriately the creditworthiness of the undertaken investment.

vi) Finally, it is difficult to find a general relationship between economic and financial risks and cost of debt by firm's size for the European companies. So the differences among the economic functions, relative risks, payoffs and, therefore, the economic interests of the suppliers of equity and debt finance in the European financial systems could explain better this finance gap.

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## Annexes

### Annex 1: Industry sectors included in the database BACH

| Sector | Former NACE sector codes |
|---|---|
| ENERGY AND WATER | 11+12+13+14+15+16+17 |
| MANUFACTURING INDUSTRY | |
| Intermediate products | |
| Extraction of metalliferous ores and preliminary processing of metal | 21+22 |
| Extraction of non-metalliferous ores and manufacture of non-metallic mineral products | 23+24 |
| Chemicals and man-made fibres | 25+26 |
| Investment goods and consumer durables | |
| Manufacture of metal articles, mechanical and instrument engineering | 31+32+37 |
| Electrical and electronic equipment including office and computing equipment | 33+34 |
| Manufacture of transport equipment | 35+36 |
| Non-durable consumption goods | |
| Food, drink and tobacco | 41+42 |
| Textiles, leather and clothing | 43+44+45 |
| Timber and paper manufacture, printing | 46+47 |
| Other manufacturing industries not elsewhere specified (n. e. s.) | 48+49 |
| BUILDING AND CIVIL ENGINEERING | 50 |
| TRADE | |
| Wholesale trade, recovery services | 61+62+63 |
| Sale of motor vehicles, wholesale and retail trade | N/A. |
| Retail trade | 64+65 |
| Hotels-Restaurant | 66 |
| Transport and communication | 71+72+73+74+75+76+77 +79 |
| Other services n. e. s. | 67+(83 to 98) |

233 Wood, paper, printing no longer includes 467 wooden furniture (old NACE). There is no equivalent in the new NACE.

234 Other manufacturing industries no longer includes 493 photographic development (old NACE). This activity is now included in 44 Other Services).

*Source*: BACH (European Commission, 2000).

## Annex 2: Results of the estimated coefficients in the regression models for each year

Dependent Variable: Total bank debt/Total debt
Method: Ordinary Least Squared

| $\beta$ Coefficients | 1990 | | 1991 | | 1992 | | 1993 | | 1994 | | 1995 | | 1996 | | 1997 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Constant** | 0.3130 | (13.97) | 0.3236 | (14.52) | 0.3655 | (18.47) | 0.3562 | (18.66) | 0.3252 | (15.92) | 0.3327 | (16.66) | 0.3254 | (17.69) | 0.3541 | (18.22) |
| **SIZEONE** | 0.0647 | (6.032) | 0.0657 | (5.970) | 0.0802 | (7.382) | 0.0761 | (6.914) | 0.0982 | (9.296) | 0.0980 | (9.363) | 0.1086 | (10.68) | 0.1273 | (11.69) |
| **SIZETWO** | 0.0615 | (5.667) | 0.0682 | (6.137) | 0.0802 | (7.399) | 0.0800 | (7.157) | 0.0957 | (8.927) | 0.0938 | (8.891) | 0.0975 | (9.486) | 0.0920 | (9.027) |
| **CASHFLOW** | 0.0053 | (3.487) | 0.0051 | (3.518) | 0.0029 | (1.981) | 0.0032 | (2.160) | 0.0035 | (2.336) | 0.0024 | (1.686) | 0.0037 | (2.668) | 0.0050 | (3.572) |
| **TRADECRED** | -0.004 | (-6.76) | -0.004 | (-6.80) | -0.004 | (-6.87) | -0.004 | (-6.64) | -0.004 | (-7.33) | -0.004 | (-7.48) | -0.003 | (-5.79) | -0.003 | (-6.07) |
| **SPAIN** | 0.0371 | (2.400) | 0.0353 | (2.206) | 0.0216 | (1.391) | 0.0258 | (1.583) | 0.0215 | (1.391) | 0.0220 | (1.406) | -0.033 | (-2.24) | -0.083 | (-4.74) |
| **FRANCE** | -0.086 | (-5.67) | -0.093 | (-5.94) | -0.125 | (-8.08) | -0.129 | (-8.22) | -0.132 | (-8.51) | -0.127 | (-8.04) | -0.172 | (-11.4) | -0.221 | (-12.5) |
| **ITALY** | 0.0632 | (3.926) | 0.0684 | (4.084) | 0.0503 | (3.104) | 0.0326 | (1.967) | 0.0457 | (2.791) | 0.0479 | (2.926) | 0.0001 | (0.001) | -0.051 | (-2.82) |
| **BELGIUM** | -0.057 | (-3.71) | -0.080 | (-5.06) | -0.099 | (-6.55) | -0.096 | (-6.23) | -0.076 | (-5.04) | -0.077 | (-5.12) | -0.112 | (-7.74) | -0.155 | (-9.21) |
| **GERMANY** | -0.051 | (-3.31) | -0.054 | (-3.37) | -0.063 | (-3.99) | -0.058 | (-3.67) | -0.048 | (-3.11) | -0.040 | (-2.58) | -0.067 | (-4.42) | -0.113 | (-6.60) |
| Num. observations | 394 | | 394 | | 393 | | 394 | | 393 | | 395 | | 396 | | 373 | |
| R-squared | 0.3730 | | 0.4087 | | 0.4681 | | 0.4401 | | 0.4828 | | 0.4852 | | 0.5220 | | 0.5505 | |
| S.E. of regression | 0.0841 | | 0.0866 | | 0.0840 | | 0.0864 | | 0.0840 | | 0.0840 | | 0.0820 | | 0.0818 | |

T-Statistics in parenthesis.

*Source*: Own estimations based on BACH database.

**Annex 3: Results of the estimated coefficients in the regression models for each country**

Dependent Variable: Total bank debt/Total debt
Method: Ordinary Least Squared

| $\beta$ Coefficients | BELGIUM | | GERMANY | | AUSTRIA | | SPAIN | | ITALY | | FRANCE | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Constant** | 0.3361 | (19.820) | -0.0249 | (-1.5581) | 0.1652 | (7.3240) | 0.4884 | (40.233) | 0.4249 | (25.526) | 0.1229 | (8.4086) |
| **SIZEONE** | 0.0863 | (10.794) | 0.0813 | (8.4193) | 0.0735 | (7.4269) | 0.0785 | (12.624) | 0.0641 | (9.8402) | 0.1016 | (16.092) |
| **SIZETWO** | 0.0532 | (6.4926) | 0.0650 | (8.1090) | 0.0227 | (2.6839) | 0.0846 | (13.746) | 0.0472 | (7.4291) | 0.0857 | (13.164) |
| **CASHFLOW** | -0.004 | (-3.415) | 0.0154 | (16.919) | 0.0032 | (2.8434) | 0.0017 | (2.2610) | 0.0007 | (0.6673) | 0.0044 | (4.5922) |
| **TRADECRED** | -0.003 | (-6.438) | 0.0052 | (8.1390) | - | - | -0.0068 | (-25.052) | -0.0045 | (-11.706) | -0.0023 | (-7.2413) |
| **1990** | -0.006 | (-0.399) | -0.0079 | (-0.6924) | 0.0310 | (1.9102) | -0.0638 | (-5.3564) | 0.0134 | (1.2803) | 0.0550 | (5.2485) |
| **1991** | -0.025 | (-1.735) | 0.0117 | (1.0294) | 0.0342 | (2.0902) | -0.0603 | (-5.0982) | 0.0219 | (2.0713) | 0.0558 | (5.3323) |
| **1992** | -0.017 | (-1.170) | 0.0399 | (3.5217) | 0.0629 | (3.7062) | -0.0550 | (-4.6579) | 0.0323 | (3.0296) | 0.0496 | (4.7310) |
| **1993** | -0.024 | (-1.605) | 0.0719 | (6.1937) | 0.0475 | (2.7868) | -0.0432 | (-3.6495) | 0.0052 | (0.4786) | 0.0406 | (3.8480) |
| **1994** | -0.019 | (-1.285) | 0.0484 | (4.2345) | 0.0238 | (1.4074) | -0.0469 | (-3.9358) | 0.0004 | (0.0339) | 0.0163 | (1.5576) |
| **1995** | -0.024 | (-1.644) | 0.0521 | (4.5410) | 0.0224 | (1.3052) | -0.0609 | (-5.1459) | 0.0022 | (0.2086) | 0.0155 | (1.4811) |
| **1996** | -0.030 | (-2.039) | 0.0615 | (5.3192) | 0.0481 | (2.7967) | -0.0890 | (-7.4624) | -0.0122 | (-1.1508) | 0.0089 | (0.8432) |
| **1997** | -0.029 | (-1.974) | 0.0538 | (4.6825) | 0.0330 | (1.7350) | -0.0625 | (-5.2387) | -0.0229 | (-2.1469) | 0.0019 | (0.1769) |
| **1998** | -0.032 | (-2.182) | - | - | 0.0448 | (2.3153) | -0.0850 | (-7.1601) | -0.0205 | (-1.9410) | - | - |
| Num. observations | 669 | | 486 | | 604 | | 758 | | 759 | | 621 | |
| R-squared | 0.2341 | | 0.6967 | | 0.1687 | | 0.5665 | | 0.2878 | | 0.4150 | |
| S.E. of regression | 0.0840 | | 0.0588 | | 0.0841 | | 0.0690 | | 0.0709 | | 0.0615 | |

T-Statistics in parenthesis.

*Source*: Own estimations based on BACH database.

**Annex 4: Results of the estimated coefficients in the regression models for each country**

Dependent Variable: Cost of debt
Method: Ordinary Least Squared

| $\beta$ Coefficients | DENMARK | | SPAIN | | ITALY | | FRANCE | | BELGIUM | | PORTUGAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Constant** | 0.0606 | (77.793) | 0.1383 | 35.26330 | 0.1266 | (41.017) | 0.0669 | (23.010) | 0.100640 | 31.80103 | 0.1759 | (26.777) |
| **SIZEONE** | 0.0106 | (9.9677) | 0.0098 | (3.261041 | 0.0148 | (4.5076) | -0.0084 | (-3.7335) | -0.0166 | (-7.1239) | -0.0132 | (-2.998) |
| **SIZETWO** | 0.0024 | (2.2402) | 0.0039 | (1.286999 | 0.0038 | (1.1734) | -0.0086 | (-3.8159) | 0.0026 | (1.1299) | 0.0052 | (1.1818) |
| **1991** | - | - | -0.0133 | (-2.6903) | -0.0258 | (-5.2783) | 0.0298 | (8.1103) | 0.0079 | (1.9452) | -0.0055 | (-0.6660) |
| **1992** | - | - | -0.0121 | (-2.449) | -0.0121 | (-2.4819) | 0.0314 | (8.5197) | 0.0096 | (2.3635) | -0.0006 | (-0.0747) |
| **1993** | - | - | -0.0025 | (-0.4971) | -0.0181 | (-3.7146) | 0.0289 | (7.8519) | 0.0092 | (2.2744) | -0.0014 | (-0.1681) |
| **1994** | - | - | -0.0341 | (-6.920) | -0.0415 | (-8.5009) | 0.0126 | (3.4221) | 0.0004 | (0.0931) | -0.0356 | (-4.4543) |
| **1995** | - | - | -0.0330 | (-6.6942) | -0.0331 | (-6.7782) | 0.0106 | (2.8747) | -0.0036 | (-0.9055) | -0.0493 | (-6.1985) |
| **1996** | -0.0167 | 0.0016) | -0.0426 | (-8.6397) | -0.0419 | (-8.5771) | 0.0011 | (0.2924) | -0.0167 | (-4.1406) | -0.0664 | (-8.4851) |
| **1997** | -0.0219 | (-13.404) | -0.0598 | (-12.119) | -0.0582 | (-11.916) | 0.0022 | (0.5983) | -0.0163 | (-4.0440) | -0.0769 | (-9.8343) |
| **1998** | - | - | - | - | - | - | - | - | -0.0254 | (-6.3314) | -0.0931 | (-11.951) |
| Num. observations | 657 | | 551 | | 690 | | 552 | | 603 | | 424 | |
| R-squared | 0.3609 | | 0.3308 | | 0.2552 | | 0.2784 | | 0.2913 | | 0.4885 | |
| S.E. of regression | 0.0112 | | 0.0289 | | 0.0351 | | 0.0216 | | 0.0233 | | 0.0368 | |

T-Statistics in parenthesis.

*Source*: Own estimations based on BACH database.

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