

The agency costs of debt in private family firms

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Abstract

This paper uses a cross sectional sample of 485 lines of credit from the NSSBF database to investigate the significance of the agency costs of debt at private family firms. Contrary to previous studies, we consider the price of the loan as multidimensional: it mainly consists of the interest rate, business collateral and personal collateral requirements. In order to take into account the jointness in debt terms, we *simultaneously* estimate the entire model consisting of an interest rate equation, business collateral equation and personal collateral equation using an instrumental variable technique, 2SLS. The results reveal that private family firms are confronted with higher agency costs of debt, reflected in the pledging of personal collateral. No substitution with other debt terms seems to be possible. Personal collateral seems to be an effective tool to cope with self-control problems reducing any possibility of ex post risk shifting behaviour and free riding. In addition, the results show that the interest rate and business collateral can be considered as substitutes while family ownership has no effect on these loan conditions.

Key words: private family firm, agency costs of debt, collateral, interest rate

1. Introduction

Private family firms have a unique ownership structure in that their founders or descendants are among the largest shareholders, usually manage the firm and have a seat on the board of directors (Anderson and Reeb, 2003). Traditional agency theory predicts that in private family firms, the *shareholder-manager agency conflict* is expected to be minimal. Concentrated ownership and owner-management would lead to a minimum or even zero level of agency costs between owners and managers (Jensen and Meckling, 1976; Fama and Jensen, 1983). Currently, however, there is a debate going on whether private family firms incur higher or lower agency costs (e.g. Schulze et al. 2001; Schulze et al., 2003). These recent studies contested the traditional agency view and argued that agency costs in private family firms could be even higher than in non-family firms due to possible negative effects of self-control and parental altruism.

Besides the increasing attention for the shareholder-manager agency conflict, Jensen and Meckling (1976) also discussed in their seminal study a second agency problem being the *shareholder-debtholder agency conflict* which is far less researched in the context of family firms. The impact of family ownership and/or family members holding powerful positions on the shareholder-debtholder agency conflict, remains a puzzle. On the one hand, the undiversified portfolio of private family firm owners implies a long term view of the owners through which valuable trust can be build between firm and lenders, leading to lower agency costs of debt (Ang, 1992). On the other hand, the family character may exacerbate this agency problem since controlling owners of private family firms are more vulnerable for self-control problems due to the isolation from the disciplining effect of external markets. This increases the probability of risk shifting behaviour, hold up and adverse selection in the labour markets (Lubatkin et al. 2005, Schulze et al., 2001). From the point of view of the bank, these problems could have a negative influence on several financial indicators including repayment

capacity, leading to more stringent lending conditions such as a higher interest rate and more collateral requirements (Voordeckers and Steijvers, 2006). Consequently, agency costs of debt may be higher in private family firms.

Even though there is a growing number of contributions on whether the organization as a family firm would exacerbate or mitigate the shareholder-debtholder agency conflict, the empirical literature on this issue is currently scant and contradicting (Brau, 2002; Anderson et al. 2003; Voordeckers and Steijvers, 2006; Wu et al., 2007; Steijvers et al., 2007). In addition, the few empirical studies conducted in this field of research show seemingly inconsistent results. This may be explained by their research set-up failing to look at both interest rate as well as collateral requirements (e.g. Anderson et al., 2003; Voordeckers and Steijvers, 2006; Steijvers et al., 2007) or ignoring the simultaneity or jointness in debt terms (e.g. Brau, 2002; Wu et al., 2007).

In this study, we investigate whether agency costs of debt in private family firms are higher or lower. If financial institutions deem this shareholder-debtholder agency problem important enough, this would be reflected in their pricing behaviour. This pricing by lenders can be reflected in the explicit price being a higher *interest rate* as well as in the implicit price with higher *collateral requirements* as most important element. Brick and Palia (2007) indicate the necessity to simultaneously consider explicit as well as implicit prices. They find strong evidence for a jointness in the terms of lending: lenders do not determine the interest rate separately from any other loan term e.g. business and personal collateral requirements. In our study, we will avoid both shortcomings by considering simultaneously the interest rate, business collateral and personal collateral requirements. Even though the distinction between business and personal collateral is often neglected, the ‘implicit value’ of personal collateral as a disciplining device that limits the borrower’s risk preference incentives and thus protects the debtholder’s interests is higher (Mann, 1997; Voordeckers and Steijvers, 2006). The

principle of jointness in the terms of lending necessitates the use of simultaneous equation modelling when estimating the effect of different (family) firm characteristics on the agency costs of debt reflected in the interest rate as well as collateral requirements.

Using a cross sectional sample of 485 lines of credit reported in the 1993 National Survey of Small Business Finance (NSSBF), we examine whether small private family firms have higher or lower agency costs of debt, as reflected in the main contractual loan arrangements being the interest rate and collateral requirements. Contrary to Anderson et al. (2003) who focus on publicly traded firms, we would like to concentrate on *small private family firms* because they have to rely mainly on bank debt when looking for external finance. Their financing is to a large extent affected by the agency costs of debt that may be charged to the family firms. They are also more vulnerable for self-control problems due to the isolation from the discipline from external markets. In addition, smaller firms cope with more information asymmetry problems vis-à-vis lenders and higher monitoring costs which may lead to higher collateral requirements instead of higher interest rates due to adverse selection and moral hazard problems (Freixas and Rochet, 1998). This necessitates the use of simultaneous equation modelling in order to estimate the effect on several debt terms.

This paper proceeds as follows. In the next section, agency costs of debt in privately held family firms are discussed and our main hypothesis is derived. In the subsequent section, the data and empirical method are discussed. Finally, we present and discuss our results.

2. Agency costs of debt in the context of small private family firms

2.1. Agency costs of debt

Financial institutions are confronted with three categories of agency costs of debt (Jensen and Meckling, 1976). First, obtaining bank debt may *adversely affect the behaviour* of the owner-manager. The owner-manager may have an incentive to invest in projects which promise high payoffs if successful even if they have a low probability of success. If the project succeeds, the borrower and not the lender captures most of the gains but when the project fails, the creditors bear most of the costs. Hence, there will be a wealth transfer from the 'naïve' debtholder to the equity holder. These incentive effects engender *monitoring and bonding costs*, which are regarded as the second source of debt agency costs. In theory, financial institutions could include debt covenants into their debt contracts which limit the behaviour of the borrower and puts constraints on the management's decisions (Smith and Warner, 1979). However, in order to completely avoid any incentive effects, these covenants would have to be very detailed and cover all aspects of the firm which is almost impossible. All costs associated with these covenants are monitoring costs (Jaffee and Russell, 1976). Lenders will include covenants and monitor the compliance with these covenants to the point where the marginal cost equals the marginal benefits perceived by the lender. Instead of the lender incurring monitoring costs which are imposed on the firm (e.g. producing financial reports), it can be worthwhile for the firm to provide this information to the lender at a lower cost, for example by providing collateral. These costs are considered bonding costs. The third major component of the agency costs of debt is the existence of *bankruptcy and reorganization costs*. When the firm cannot meet a payment on a debt obligation, the firm goes into bankruptcy which is not costless. It involves an adjudication process which consumes a part of the value of the firm's assets. However, Jensen and Meckling (1976) argue that these bankruptcy costs are a rather small part of total agency costs of debt.

2.2. Private family firms and the agency costs of debt

In the context of private family firms, the family dimension may alleviate the agency costs of debt. The large undiversified equity position and control of management and directors places the family in an excellent position to influence and monitor the firm. Furthermore, family shareholders have longer investment horizons (James, 1999; Sirmon and Hitt, 2003) and as such, a higher investment efficiency (Anderson and Reeb, 2003). Family firms with large undiversified ownership stakes are long term investors with substantial wealth at risk and wishing to pass the firm onto their heirs. This long term perspective can be valuable in building trust between firm and financial institution reducing any possibility of adverse behaviour by the family firm. This long term relationship with the lender, characterized by trust, may alleviate monitoring or bonding costs necessary to avoid any behaviour that would negatively affect the repayment of the loan.

However, family ownership seems to have also the potential to exacerbate the debt agency conflict and corresponding agency costs. Once a family has enough ownership for unchallenged control, it can begin to abuse its power by taking resources out of the business (Claessens et al., 2002). In this case, a major owner may use its controlling position in the firm to free ride by using the firm's resources for personal benefits and privileges of family members (Schulze et al., 2003). In addition, family controlled firms have a higher likelihood to be characterized by special dividends payout or excessive compensation (Anderson and Reeb, 2003). Controlling owners may be more vulnerable for self-control problems, increasing the probability of risk shifting behaviour and hold up (Lubatkin et al., 2005). Concentrated ownership may also lead to limiting executive management positions to family members (Anderson and Reeb, 2003; Lubatkin et al. 2005) and managerial entrenchment (Gomez-Mejia et al., 2001). Restricting promotional opportunities and top management

positions to a labour pool of family members can be problematic as the risk of hiring low quality employees increases (Shleifer and Vishny, 1997; Anderson and Reeb, 2003). These agency problems could have a negative effect on operating performance which has to keep a sufficiently high level to cover the interest payments. Moreover, negative performance effects could ultimately lead to bankruptcy. A creditor would reflect these negative effects in the lending conditions such as the interest rate and the collateral requirements. As a consequence, small private family firms may experience higher agency costs of debt than private non-family firms.

2.3. Agency costs of debt and the pricing of loans

If the agency costs of debt in small private family firms are higher and they are important enough for a financial institution, they will be reflected in a higher pricing of debt. This higher price would provide evidence that the agency costs of debt are statistically and economically significant. However, when lending to *small* private family firms, banks may choose not to increase the explicit price being the interest rate due to the existence of informational asymmetries between borrower and lender resulting in adverse selection and moral hazard problems (Leland and Pyle, 1977). The interest rate may influence the borrower in his selection of projects. If the bank increases the interest rate, the borrower will prefer higher risk projects above low risk projects, decreasing the expected return for the bank (moral hazard effect). Higher interest rates will also attract higher risk firms while lower risk firms drop out (adverse selection effect).

So, instead of increasing the interest rate, banks may opt to increase the implicit price of the loan e.g. increasing collateral requirements. According to agency theory, signalling and monitoring are important ways of dealing with the shareholder-debtholder agency conflict

(Jensen and Meckling, 1976). For small firms, bonding by means of collateral provided by the entrepreneur is more widely used rather than the more costly monitoring (Harris and Raviv, 1991). Small firms willing to invest in high risk projects will not agree to the financial institution's high collateral demands varying from business collateral to even personal collateral. The probability increases that the firm will have to liquidate the assets in case of default. After obtaining the loan, higher collateral requirements will also avoid any risk shifting behaviour by the firm. Thus, increasing collateral requirements instead of the interest rate may alleviate any adverse selection or moral hazard effects. In addition, collateral creates a barrier-to-entry for other competing banks. Secured credit limits the family firm's ability to obtain future loans from other lenders and reduces the lender's risk of excessive future borrowing by the firm (Mann, 1997). By increasing collateral requirements instead of the interest rates, the financial institution can attract borrowers from competing banks. The higher collateral requirements may not withhold family firms from lending if they want to invest in projects with a positive net present value.

In addition, business collateral and personal collateral do not have the same value in solving agency problems in small firms. Personal collateral has a higher implicit value as a disciplining device that limits the borrower's risk preference incentives than business collateral (Mann, 1997). The lender receives explicit claims on personal assets and the future wealth of the borrower, which he cannot rely on in the case of business collateral (Ang et al., 1995; Voordeckers and Steijvers, 2006). Furthermore, the likelihood that the borrower will feel any losses personally is higher when granting personal collateral. Previous results by Voordeckers and Steijvers (2006) also suggest that private family firms incur higher personal collateral requirements when obtaining a loan.

Taken together, we hypothesize that small private family firms incur higher agency costs of debt which would be mainly reflected in higher *personal* collateral requirements. As

higher interest rates and business collateral seem to be not sufficient to cope with the specific agency problems in private family firms, we do not expect that financial institutions use them as such. Moreover, given the possible substitution effect between interest rate and collateral requirements (Brick and Palia, 2007), we argue that banks will cope with the general agency problems of debt - not specific to family firms - by choosing a higher level of interest rates *or* a higher business collateral requirements. Hence, we do not expect that private family firms have to provide a higher interest rate or higher business collateral requirements than non-family firms. However, the specific agency problems to private family firms will be priced by higher personal collateral requirements.

Hypothesis 1a : Private family firms incur higher agency costs of debt than non-family firms which will be reflected in higher personal collateral requirements but not in a higher interest rate nor higher business collateral requirements.

Hypothesis 1b : The interest rate and business collateral will be substitutes while personal collateral will show no substitution effect.

3. Methodology

3.1. Data set

Our analysis is based on the data collected by the 1993 'National Survey of Small Business Finance' (NSSBF). This survey, conducted five-yearly by the Federal Reserve Board of Governors and the U.S. Small Business Administration, collects several firm ownership, management and financial characteristics on small businesses (fewer than 500 employees) in the US. This database indicates which firms can be considered as private

family firms. Our dataset will only consist of the most recent loans approved to these firms since only for these loans the interest rate is reported. As suggested by Berger and Udell (1995), we concentrate on lines of credit in order to obtain a rather homogeneous sample of loans. By limiting our study to lines of credit, we exclude those loans that are mainly transaction driven e.g. motor vehicle loans, mortgages and equipment loans, and based on the purchase of a fixed asset which may lead to asset based lending in which especially business collateral is expected to be important. Hence, in order to achieve a more complete understanding of the agency costs of debt and the interplay between the explicit and implicit price of debt, we focus on lines of credit. After eliminating missing values and outliers, we obtain a final sample of 477 lines of credit.

3.2. Regression model

Based on the jointness of the debt terms as argued by Brick and Palia (2007), we opt for a simultaneous system of equations model consisting of three equations with interest rate premium, business collateral and personal collateral as dependent variables. In this study, we take into account that debt agency costs at private family firms can be reflected in these three aspects of the price of the loan. We distinguish between business collateral and personal collateral even though in empirical literature this distinction is often neglected.

In order to control for a potential endogeneity problem, we will use an instrumental variable, two-stage least-squares framework. For each endogenous variable, we will rely on specific instruments. In equation (1), we will rely on instrumental variables to measure ‘business collateral’ and ‘personal collateral’. Analogously, equation (2) and (3) will include instrumental variables for ‘personal collateral’ and ‘interest rate premium’ (equation 2) and for ‘business collateral’ and ‘interest rate premium’ (equation 3). In each equation of the

model, we estimate a vector of independent variables W and a vector of common control variables X . The instruments will satisfy rank and order conditions that identify the system of equations:

$$\begin{aligned} \text{Interest rate premium} = & \alpha_{LR} + \beta_{LR} \text{ business collateral} + \chi_{LR} \text{ personal collateral} + \delta_{LR} W + \\ & \varepsilon_{LR} X + \gamma_{LR} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Business collateral} = & \alpha_{BC} + \beta_{BC} \text{ personal collateral} + \chi_{BC} \text{ interest rate premium} + \delta_{BC} W \\ & + \varepsilon_{BC} X + \gamma_{BC} \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Personal collateral} = & \alpha_{PC} + \beta_{PC} \text{ business collateral} + \chi_{PC} \text{ interest rate premium} + \delta_{PC} W + \\ & \varepsilon_{PC} X + \gamma_{PC} \end{aligned} \quad (3)$$

3.3. Variables

A. Dependent endogenous variables

The interest rate premium (INTPREM) is defined as the difference between the contractual interest rate set for the credit line and the prime rate for the month when the loan was approved (Berger and Udell, 1995, Brick and Palia, 2007). Business collateral (BUSCOLL) is a binary dummy variable with a value ‘1’ if the firm has to pledge the firm’s assets as collateral in order to obtain a loan and is zero otherwise. Personal collateral (PERSCOLL) is a binary dummy variable with a value ‘1’ if the owner has to put his personal assets at stake when obtaining a loan and is zero otherwise.

B. Independent and control variables

In each equation of the model, we incorporate several firm loan and bank relationship characteristics. As firm characteristics, we include firm size, firm risk and a family firm dummy. The NSSBF database allows us to incorporate a binary dummy variable with a value '1' if the firm is a family firm (FAM). A firm is defined as a family firm if more than 50% of the firm is owned by a single family. To incorporate firm risk, the firm's leverage is calculated as total debt divided by total annual sales (LEVERAGE). Firm size is measured by the natural logarithm of total sales (LNSALES). Besides the fitted values for collateral requirements and interest rate premium resulting from the instrumental variable technique (see section C), the natural logarithm of loan maturity in months (LNMATURITY) is included as a loan characteristic of the line of credit. To capture the effect of a relationship with the lender, we include the natural logarithm of the relationship length with the financial institution in months (LNRELATION) and a dummy variable (MAINBANK) with a value '1' if the loan is granted by the firm's principal or main bank and value '0' when the loan is obtained from another bank.

Finally, we also control for industry and organizational form. We include eight dummy variables to account for industry differences. Each dummy variable accounts for a range of 10 two digit SIC codes. We also include four dummy variables to capture possible differences in collateral requirements due to liability differences between family firms organized as proprietorships, partnerships, S corporations and C corporations.

C. Instrumental variables

When using instrumental variable techniques, finding good instruments could be a real challenge. The NSSBF database does only provide a limited choice of possible instrumental variables. Therefore, we selected the same instrumental variables used in the study of Brick and Palia (2007). Brick and Palia (2007) also use the NSSBF 1993 database and find that, based on the Hansen-Sargan statistic, each of their instruments used, in the interest rate equation as well as in the business and personal collateral equation, is valid. So, this result justifies the use of the same instrumental variables in our study.

The instrumental variables used in the *interest rate equation* are the age of the firm in years (FIRMAGE) and a dummy variable as an indicator for the market power of banks (HHI). Based on the NSSBF 1993, this dummy variable obtains a value '1' if the Herfindahl index for deposits in the firms Standard Metropolitan Statistical Area is larger than 1800 and a value '0' otherwise. We expect both variables to have negative sign. Older firms are expected to have more bargaining power and have a proven track record that could lead to lower interest rates. Higher competition between banks is expected to result in lower interest rates. In addition, we include an interaction effect (INTER) between firmage and the HHI index: if banks especially compete for young firms in order to capture them, obtain private information and generate a longlasting profitable relationship, the interaction variable should show a positive sign.

For the *business collateral equation*, the firm's delinquency on business obligations (DELINQ) is used as the instrument to measure business collateral. Since John et al. (2003) indicate that business collateral may reduce the expected bankruptcy costs, the relationship between the use of business collateral and firm risk is expected to be positive. It is assumed that the borrower has a higher probability of pledging business collateral when the firm has

defaulted on a previous loan. DELINQ is a dummy variable with a value '1' if the firm has defaulted during the past three years and '0' otherwise. However, when checking the validity of this instrument for business collateral, the χ^2 test reveals that, contrary to Brick and Palia (2007), we can not reject the hypothesis that the instrument is equal to zero. So, only for business collateral, we need to modify the selection of instrumental variables as used by Brick and Palia (2007). We decide to add a second instrument related to the firm's risk being the profitability of the firm (ROA). The χ^2 test that the instruments are jointly equal to zero is rejected. So, this combination of both variables generates a valid instrument for business collateral.

In the *personal collateral equation*, four instruments are introduced: past defaults by the principal owner of the firm (DEFAULT), age of the entrepreneur (AGE), percentage ownership of the firm held by the largest shareholder (OWNSH) and the number of years experience of the CEO (EXP). Personal collateral acts as a disciplining device that limits the borrower's risk preference incentives and thus protects the debtholder's interests to a larger extent. By pledging personal collateral, the owner of the firm signals his belief in his firm and the ability to repay the loan. It reduces any moral hazard problems: the borrower will be less inclined to engage in risk shifting activities due to the risk of losing any personal assets. The signalling value of personal collateral is expected to decrease for older, more experienced CEO's who own a significant share of the firm.

Table I presents the descriptive statistics on the variables included in our study. The median borrower firm pays an interest rate premium of 2%, and has obtained a line of credit with a maturity of 1 year. The median firm has a relationship with the lender for five years and is twelve years in operation. The median CEO of the firm is 49 years old and has 18 years of experience as a CEO. More than 78% of the loans obtained in our sample are obtained by family firms. Looking at our entire sample of loans, many lines of credit require the pledging

of collateral: for 50.6% of the loans obtained business collateral had to be pledged while for 63.1% of the loans even personal collateral was required. Most of the loans in our sample are obtained from their main bank (78.8% of the firms).

INSERT TABLE I

4. Results

Table III reports the simultaneous system of equation estimation results.¹ In these models, we treat the interest rate as determined simultaneously with the request for business and personal collateral, by implementing an instrumental variable approach. Table III reports the two stage least squares estimations (2SLS). For the interest rate premium regression, we regress in the first stage the variables personal and business collateral on all instrumental variables and control variables (results not reported). The fitted values from this stage are used as independent variables in the interest rate premium equation in table III. The same methodology is used in the business collateral equation and personal collateral equation.

INSERT TABLE III

¹ In the simultaneous system of equation estimation, Brick and Palia (2007) not only include the fitted values of the endogenous variables as independent variables, but also the instrumental variables used to become these fitted values. We do not consider this necessary. However, using the same model would not have any significant effect on our results. (results not reported)

As hypothesized (hypothesis 1b), table III shows a significant substitution effect, on a 1% significance level, between the interest rate premium and the pledging of *business collateral* but not for personal collateral. The significant negative sign of business collateral (BUSCOLL) in the interest rate equation as well as the significant negative sign of the interest rate premium (INTPREM) in the business collateral equation indicate that SME's can offer more business collateral in order to obtain a lower interest rate and vice versa. So, when considering the debt terms, we argue that there is a substitution effect between business collateral and the interest rate premium for the whole population of SME's, consisting of private family and non family firms. SME's may show their belief in their projects by showing willingness to pledge business collateral which reduces the risk for the bank and may lead to lower interest rates. If they lack the necessary business collateral, they can provide the bank with higher interest rates in order to obtain a loan. This simultaneous estimation model may nuance the finding by Anderson et al. (2003) who report that family firms can obtain debt at a lower cost and thus, family ownership better protects the interests of debtholders. They conclude that (public) family firms incur lower debt agency costs by only considering the lower interest rates paid. However, lower interest rates may go hand in hand with higher collateral requirements. The possible substitution effect between both debt terms should be taken into account when studying the agency costs of debt.

Being organized as a private family firm ('FAM') does not have a significant impact on the interest rate. As hypothesized (hypothesis 1a), the results indicate that private family firms cope with higher debt agency costs as reflected in the collateral demand, more specifically in the pledging of *personal collateral*. The variable 'FAM' shows a significant positive sign in the personal collateral equation. Banks may choose not to increase the explicit price being the interest rate due to informational asymmetries between borrower and lender. An increase in the interest rate as a reflection of higher agency costs of debt may result

in adverse selection and moral hazard problems. This result is in line with the empirical study by Voordeckers and Steijvers (2006) who argue that private family firms have a higher probability of pledging personal collateral. Private family firms seem to be obliged to offer more often personal collateral compared to non family firms in order to obtain a bank loan. For personal collateral, we find no significant substitution effect with other researched debt terms. This result, that family firms have a higher probability of having to pledge personal collateral, is also in line with the argumentation by Schulze et al. (2003) that altruism may have a drawback, causing higher agency costs such as 'free riding' by family members entrenchment of ineffective managers or predatory managers (Bruce and Waldman, 1990; Morck et al., 1988; Morck and Yeung, 2003; Chrisman et al., 2004). Schulze et al. (2003) suggest that parents' altruism will lead them to be generous to their children even when these children free ride and lack the competence or intention to sustain the wealth creation potential of the firm. Linking this argument to the credit acquisition process, banks seem to be more cautious by demanding personal collateral when dealing with family firms. Family firms seem to be considered by banks as borrowers with a higher risk which increases the probability of having to pledge personal collateral. Family firms are not allowed to provide more business collateral or pay a higher interest rate in order to safeguard their personal wealth. As indicated by Harris and Raviv (1991), bonding by way of collateral provided by the entrepreneur is more widely used than the more costly monitoring required by business collateral, covenants... Personal collateral seems to be an outstanding tool for financial institutions to cope with self-control problems and the negative effects of altruism in family firms. When an entrepreneur has to put his personal assets at stake, he will be less inclined to engage in free riding, risk shifting behavior and hold up. By demanding personal collateral, the bank guarantees the repayment of the loan.

As far as the other independent variables are concerned, we see that when bank loans are obtained from their main bank, the probability of having to provide personal collateral (even on 5% significance level) increases. The bank seems to be exploiting its power over the firm when being the main bank (Mann, 1997). This result is in line with the results of Voordeckers and Steijvers (2006) and Degryse and Van Cayseele (2000). More indebted firms as well as larger firms seem to pledge more often business collateral. Firm size does not show a significant effect. In addition, relationship length seems to have no significant effect on neither contracting variable researched. This result is consistent with Petersen and Rajan (1994) and Voordeckers and Steijvers (2006) who find no significant relationship between relationship length on the one hand and interest rate and collateral requirements on the other hand. Compared to C corporations, proprietorships less often have to pledge personal collateral while partnerships have to pledge less business collateral and obtain loans at a lower interest rate. C corporations have a legal personality, characterized by a limited liability of the owners. Consequently, it may lead to C corporations having to pledge collateral more often when trying to obtain a loan. Sole proprietorships and partnerships can not enjoy the limitations of liability which increases the probability of repayment of debt to the bank.

5. Conclusion

In their seminal paper, Jensen and Meckling (1976) discuss two types of agency problems: the shareholder-manager agency conflict and the shareholder-debtholder agency conflict. In current academic literature, there is a profound ongoing debate on whether (private) family firms incur higher or lower agency costs due to the separation/overlap of ownership and management (e.g. Schulze et al. 2001; Schulze et al., 2003). However, the

debate about the shareholder-debtholder agency problem in private family firms is still in its infancy.

In order to verify whether (family) firms are confronted with higher or lower debt agency costs as reflected in the main contractual arrangements being interest rate, business and personal collateral, we have to take into account the jointness in debt terms. Brick and Palia (2007) indicate the necessity to simultaneously estimate the entire model consisting of an interest rate equation, business collateral equation and personal collateral equation, using an instrumental variable technique (2SLS). Lenders seem to simultaneously determine the entire price of the loan consisting mainly of interest rate, business and personal collateral requirements.

When taken into account the simultaneous effect, the current study reveals that family firms are confronted with *higher* agency costs of debt instead of lower debt agency costs. The pricing of these agency costs by lenders is reflected in the pledging of personal collateral. Private family firms incur a higher probability of pledging personal collateral and having to put their personal assets at stake. No substitution seems to be possible with the other debt terms researched being business collateral or the interest rate. Therefore, personal collateral seems to be an effective tool to cope with self-control problems and negative effects of altruism. It reduces any possibility of ex post risk shifting behaviour and free riding. Being organized as a private family firms does not seem to have a significant impact on the interest rate or business collateral requirements. Our results reveal that for private family firms (as well as non family firms), there is a substitution effect between the interest rate premium and the pledging of business collateral. SME's can offer business collateral in order to obtain a lower interest rate and vice versa. The conclusion by Anderson et al. (2003) that family firms cope with lower agency costs of debt based on the finding of a lower interest rate may be rash.

Our study reveals that the agency costs of debt are not only reflected in the interest rate, also other debt terms e.g. business and personal collateral have to be taken into consideration.

Further research is needed to verify whether all private family firms cope with higher agency costs of debt. There is a growing consensus that family firms cannot be viewed as a homogeneous entity (Chrisman et al., 2005, Westhead and Howorth, 2007). The distinction can be made between different family firm types depending on ownership structure of the firm or the management by a family manager versus a professional outside manager (Westhead and Howorth, 2007). Villalonga and Amit (2006) point out that whether family firms experience higher agency costs may depend on how ownership is combined with family control and management.

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Table I – Descriptive statistics

| N=477 | | | | | |
|-------------------------------|-------------|---------------|-----------------|------------|-------------|
| <i>Variable</i> | <i>Mean</i> | <i>Median</i> | <i>Std.dev.</i> | <i>Min</i> | <i>Max.</i> |
| Interest premium | 1.908 | 2 | 1.86 | -3.25 | 10.75 |
| Relationship length in months | 94.23 | 60.99 | 93.80 | 1 | 889 |
| Loan maturity in months | 23.42 | 12 | 29.48 | 1 | 240 |
| Debt | 0.473 | 0.188 | 1.61 | 0.001 | 19.71 |
| Firmage in years | 16.718 | 12 | 15.50 | 1 | 129 |
| CEO age in years | 49.52 | 49 | 10.78 | 27 | 83 |
| Largest ownership share in % | 66.96 | 62 | 30.25 | 1 | 100 |
| CEO experience in years | 19.33 | 18 | 10.59 | 0 | 63 |

Table II – Percent distributions in the sample

| <i>Variables</i> | <i>%</i> |
|-----------------------------------|----------|
| Loans with personal collateral | 63.1% |
| Loans with business collateral | 50.6% |
| Loans obtained from the main bank | 78.8% |
| Family firms | 72.01% |
| Proprietaryships | 15.1% |
| Partnerships | 5.5% |
| S corporations | 28.6% |
| C corporations | 50.8% |
| Herfindahl index > 1800 | 48.3% |
| Firm's delinquency = 1 | 3.7% |
| Personal default = 1 | 9.4% |

Table III – Simultaneous system of equation estimation for the interest rate premium, business collateral and personal collateral equation

| <i>Variables</i> | Interest rate premium equation | Business collateral equation | Personal collateral equation |
|----------------------------------|--------------------------------|------------------------------|------------------------------|
| <i>INTPREM (fitted)</i> | - | -1.125 (0.251) *** | 0.273 (0.531) |
| <i>BUSCOLL (fitted)</i> | -2.479 (0.927) *** | - | 0.475 (2.209) |
| <i>PERSCOLL (fitted)</i> | 1.592 (0.992) | 0.544 (1.243) | - |
| FAM | -0.006 (0.216) | 0.239 (0.288) | 0.539 (0.268) ** |
| MAINBANK | -0.335 (0.268) | 0.117 (0.328) | 0.552 (0.274) ** |
| LNRELAT | -0.074 (0.075) | -0.104 (0.103) | -0.087 (0.120) |
| LNMATUR | 0.028 (0.107) | 0.160 (0.143) | 0.045 (0.155) |
| DEBT | 0.042 (0.062) | 0.237 (0.073) *** | -0.077 (0.154) |
| LNSALES | -0.052 (0.074) | 0.004 (0.103) | -0.125 (0.089) |
| PROPR | 0.408 (0.479) | -0.141 (0.514) | -1.313 (0.413) *** |
| PARTNERSH | -0.663 (0.379) * | -1.291 (0.526) ** | -0.354 (0.776) |
| SCORP | -0.243 (0.199) | -0.291 (0.271) | 0.264 (0.278) |
| Constant | 3.420 (1.330) *** | 1.620 (2.262) | 0.962 (2.726) |
| Number of obs. | 470 | 483 | 476 |
| F value or Wald chi ² | 4.33 | 93.10 | 36.06 |
| R ² | 0.15 *** | 0.16 *** | 0.07 ** |

*, **, *** significant at the 10%, 5% and 1% level respectively (two-tailed test). Robust asymptotic standard errors reported in parentheses.

We also controlled for the industry by including 8 dummy variables based on the two digit SIC code. (Results not reported)

Appendix: Variable definitions

| <i>Variables</i> | <i>Abbreviated</i> | <i>Definitions</i> |
|----------------------------------|--------------------|--|
| Dependent variables | | |
| Intrest premium | INTPREM | difference between the contractual interest rate set for the credit line and the prime rate |
| Business collateral | BUSCOLL | equals 1 if the firm has to pledge business collateral; 0 otherwise |
| Personal collateral | PERSCOLL | equals 1 if the firm has to pledge personal collateral; 0 otherwise |
| Independent variables | | |
| Family firm | FAM | equals 1 if the more than 50% of the firm's shares are owned by one single family; 0 otherwise |
| Firm size | LNSALES | Natural logarithm of the firm's annual sales |
| Mainbank | MAINBANK | Equals 1 if the loan is obtained from the bank the firm considers as its main banker; 0 otherwise |
| Relationship length | LNRELAT | Natural logarithm of the relationship length in months with the bank that granted the loan |
| Loan maturity | LNMATUR | Natural logarithm of the loan maturity in months |
| Debt | DEBT | Ratio of total debt outstanding divided by total annual sales |
| Control variables | | |
| Proprietorship | PROPR | Equals 1 if the firm is organized as a proprietorship; 0 otherwise |
| Partnership | PARTN | Equals 1 if the firm is organized as a partnership; 0 otherwise |
| S corporation | SCORP | Equals 1 if the firm is organized as an S corporation; 0 otherwise |
| C corporation | CCORP | Equals 1 if the firm is organized as a C corporation; 0 otherwise |
| Industry_x | IND_X | Equals 1 if the firm belongs to industry x (with x varying from 1 to 8 in order to distinguish between 8 industries) ; 0 otherwise |
| Instrumental variables | | |
| <i>For intrest rate premium:</i> | | |
| Herfindahl index | HHI | Equals 1 if the index for deposits in the MSA of the firm exceeds 1800; 0 otherwise |
| Firmage | FIRMAGE | Age of the firm in years |
| Interaction effect | INTER | Interaction of the Herfindahl index and firm age by multiplying both variables |
| <i>For business collateral:</i> | | |
| Firm's delinquency | DELINQ | Equals 1 if the firm has defaulted during the past three years; 0 otherwise |
| Profitability | ROA | Profitability divided by total assets |
| <i>For personal collateral:</i> | | |
| Personal default | DEFAULT | Equals 1 in case of past default by the principal owner; 0 otherwise |
| CEO age | AGE | Age of the CEO in years |
| Ownership share | OWNSH | Percentage ownership of firm held by the largest shareholder |
| CEO's experience | EXP | experience as CEO in years |