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Does family ownership always reduce default risk?

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Abstract

This paper analyses the effect of family ownership on the outcome of the firm's risk-taking activities, measured by the company's default risk. We show that family ownership reduces the probability of default, which is proxied by the Black-Scholes-Merton model (BSM). Our study goes further than the initial approach by taking into account certain factors conditioning the aforementioned relationship. We find that the expected negative relationship between family ownership and default risk modifies when there is a significant participation of institutional investors, whose positive moderating influence intensifies if they are stable and long-term oriented and/or during adverse financial circumstances.

Key Words: Default risk; Black-Scholes-Merton model; family ownership; institutional investors; economic downturn.

JEL classification: G01, G13, G32, G33, M21

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1. Introduction

The recent financial crisis has placed the research focus on firms' indebtedness and resilience in adverse circumstances. As indicators of the economic situation, the literature uses measures, such as default risk, which integrates various firm characteristics, including firm performance, leverage and the capacity to generate future resources. These features are part of the decision-making process, where company ownership structure is a relevant factor (Fama, 1980; Jensen and Meckling, 1976) and therefore plays a decisive role in explaining default risk. However, few papers mention ownership structure, including ownership type, as a determinant of the firms' probability to fail. We focus on the interaction of two different types of shareholders, family and institutional investors. According to research findings for a large set of economies around the world (Morck *et* al., 2005), most companies owned by an ultimate owner are family firms. Even in countries with low ownership concentration, such as the U.S., family owners exercise significant control over listed companies (Villalonga and Amit, 2009), contributing significantly to GDP and employment in the U.S.

One of the most frequently addressed topics in the family business literature, both, theoretically and empirically, is the relationship between family firms and their risk-taking behaviour through their policies on innovation, R&D investments, acquisitions, leverage and internationalization (Chrisman and Patel, 2012; DeAngelo and DeAngelo, 2000; Gomez-Mejia *et* al., 2018; Keasey *et* al., 2015; Miller *et* al., 2008). However, most previous works treat the issue uni-dimensionally, thereby drawing only a partial, albeit specialized, view of the decision-making process. The firm's probability to fail instead enables analysis of the company's global situation; that is, not just its leverage and thereby its insolvency probability, but also its investment and other firm's policies that picture its potential future operational performance. Therefore, we analyse the firms' default risk, which is the final outcome of their risk-taking.

Under the universal approach adopted in the family business literature, there exists the assumption of an inverse relationship between family ownership and default risk, based on the traditional association between family owners and risk aversion. Nevertheless, we find a general absence of papers directly testing this relationship. Our study explores this association and considers some aspects that affect the initial approach and thus condition the findings for the aforementioned relationship. The significant presence of institutional investors might influence, and thus alter predictions for, the behaviour of family owners. The relationship could also be affected by the stability of these institutional shareholders and possible adverse financial events. We test our hypotheses on a sample of publicly-traded U.S. firms over a period of 15 years, finding, as anticipated, that family ownership reduces default risk, albeit to a lesser degree in the presence of high institutional ownership, which can result in conflict between family and non-family members, thereby increasing the firm's probability of failure. This moderating effect further intensifies with greater stability of institutional holdings and in times of an economic downturn.

The study contributes to the literature in different ways. First, we include the family ownership structure as a relevant factor in the decision-making process involved in funding and investment choices (Fama, 1980; Jensen and Meckling, 1976) which ultimately determine their default risk. As emphasized by Hoskisson *et* al. (2017), the consequences of managerial risk-taking still attract less research attention than its antecedents. Despite the predominance of the family businesses and their implications for the economy, little attention has been paid to the relationship between family firms and default risk, which is the result of several corporate decisions. Some papers have considered ownership structure as a key determinant of default risk (Barry *et* al., 2011; Bonsall *et* al., 2017; Chiang *et* al., 2015; Wang *et* al., 2015; Wang *et* al., 2017) but pay no attention to family ownership. One paper that takes into account the effect of family ownership on the probability of failure is the work by Gomez-Mejia *et* al. (2007). However, these authors apply their study to a particular framework of private family firms. Our paper considers a wider context of public companies from different sectors.

The second contribution of this paper is to consider the role in default risk played by family owners of firms in shared ownership with investors entirely focused on financial goals, when the family's also include non-financial objectives. While previous studies have analysed the relationship among different types of shareholders and its effect on firm value, to the best of our knowledge, previous literature has not studied changes in risk attitude among family investors in the presence of other shareholders, such as institutional investors. Furthermore, we consider two conditioning factors of the moderating role of institutional investors. One is investor type, i.e., long- or short-term oriented; the other is adverse circumstances, such as an economic downturn. To offer a wider picture of the effect of family ownership on default risk, we draw on the Socioemotional Wealth (SEW) perspective, to expand on the Agency Theory (AT). The findings suggest that, ceteris paribus, family ownership reduces firm's default risk. However, as predicted by SEW perspective, the attitude of family owners towards risk changes with the frame of reference. When family shareholders see their non-economic goals threatened by the presence of institutional investors, they may be led towards decisions that could increase the firm's probability of failure.

Third, as mentioned above, the consequences of the company's risk-taking decisions are reconciled into a single measure. This is an explicit analysis of the probability of default, in contrast to previous studies which consider only one of its explanatory variables, such as return volatility (Gürsoy and Aydoğan, 2002), performance volatility (Boubaker *et* al., 2016), investment in risky projects (R&D) (Boubaker *et* al., 2016), or leverage (DeAngelo and DeAngelo, 2000). As a proxy of default risk we use the Black-Scholes-Merton measure (hereafter referred to as BSM), which estimates the probability of default using the market prices of the company's shares and leverage. With respect to the choice of default risk measure, when compared with the accounting-based indicators, such as the Altman's (1968) Z-score used in Barry *et* al. (2011), the BSM measure has the advantage of incorporating, not only past information, but also investors' expectations for future asset performance, by using the market prices of shares. The BSM also takes into account stock-return volatility. In comparison with the debt-related instruments, such as bond spreads, Credit Default Swaps spreads or credit ratings, used in Bhojraj and Sengupta (2003), the BSM measure affords the further advantage of widespread availability. Finally, compared to hazard rates obtained with Cox (1972) regression, used in Gomez-Mejia *et* al. (2007), the BSM measure does not depend on the availability of default events, nor on the variables chosen to explain the waiting time until default. As already mentioned, this measure takes as inputs the market value of the stocks of the company and the volatility of their returns and its leverage. Thus, this default risk proxy considers the two types of risks explained by Kempers *et* al. (2017), variability, usually measured as firm's volatility on performance or returns, and vulnerability, typically measured by financial and accounting ratios. We must remark that other measures such as the Altman Z-score or the Ohlson's (1980) O-score only consider vulnerability risk.

The remainder of the paper is structured as follows. The next section presents the theoretical arguments and hypotheses to be tested. Section 3 describes the database and the default risk measure. Section 4 includes the methodology and results and Section 5 presents some robustness checks and extensions. Finally, Section 6 highlights the main conclusions of the work as well as its main practical implications.

2. Literature Review and Hypotheses

Family ownership is one of the corporate governance mechanisms examined in the AT literature for its role in controlling risk-taking by top-level executives (Hoskisson *et* al., 2017). In a risk-taking context, non-alignment between shareholders' and managers' interests (Jensen and Meckling, 1976) translates into different predispositions towards risk. Shareholders with a significant stake in the business can prevent the “free-rider problem” (Shleifer and Vishny, 1986) and have the capability and motivation to monitor management. Information asymmetries are characteristically lower in family firms since shareholders have better access to private information. This increases their capacity to monitor managers (DeAngelo and DeAngelo, 2000; Barry *et* al., 2011), and hence, influence risk-taking. This is consistent with the “efficient monitoring” hypothesis presented by Pound (1988), which states that better-informed shareholders have more capacity to monitor their target companies.

According to the AT, firms controlled by less diversified shareholders have a strong concern for firm survival, which is especially relevant for family businesses (Boubaker *et* al., 2016) that put their personal wealth on the firm and have a long-term orientation (Miller *et* al., 2008). Therefore, family firms are more risk averse than non-family firms.

As well as from the traditional AT approach, risk-taking has been studied from a behavioural perspective, being the SEW perspective a reference in the family business literature. Gomez-Mejia *et* al. (2007) define SEW as the “non-financial aspects of the firm that meet the family’s affective needs, such as identity, the ability to exercise family influence, and the perpetuation of the family dynasty”. Under this perspective, SEW is considered as the reference point for the firm's risk-taking behaviour based on the judgement of the family owner (Casillas *et* al., 2019) whose aim is to avoid losing any of the above SEW components. Therefore, family firms aim to protect their SEW and are found to be less risk seeking (Chrisman and Patel, 2012).

As already stated, the special characteristics of family owners make them more likely to be conservative, motivated and able to control risk-taking by managers. AT and the SEW perspective, agree that the family firm becomes less risk-seeking when operating in a gain frame, that is, when the firm's expected outcome is above a reference level. Therefore, family members will not promote any action that fosters risk-taking for fear of placing the firm's SEW at risk.

In general terms, we posit that, the high risk-aversion, conservative attitudes and motivation to monitor the actions of managers contribute to lower default risk. Based on these arguments, we propose the following baseline hypothesis:

H1: Family ownership reduces default risk.

2.1. The Moderating Role of Institutional Investors on the Family Ownership – Default Risk Relationship

Certain situations could affect the high risk-aversion and conservative attitudes of family owners; therefore, the inverse relationship between family owners and default risk is not set in stone.

As already stated, family firms characteristically exercise control over their managers thereby avoiding agency costs arising from problems with the alignment of interests. However, the coexistence of family owners with other investors in the firm places these firms in the peculiar context of fractional ownership. According to AT, differences between the various owners of the firm are settled by means of voting rights, assuming board members to act professionally and independently. This is a doubtful assumption in family firms, where managerial entrenchment is high. Schulze *et* al. (2001) state that fractional ownership does not necessarily minimize the problem of agency costs, and can even exacerbate it; and Schulze *et* al. (2003) probe the theme of fractional ownership and the clash of interests between the various owners when one is a family owner intent on maintaining control. A similar problem occurs when there is a combination of family ownership (owner-manager) and institutional ownership (outside owners) with interest in monitoring the managers.

Institutional investors hold highly diversified investment portfolios and thanks to their size and economies of scale, they have easier and cheaper access to professional information services (Salganik-Shoshan, 2016). This privileged position enables them to use more refined investment selection criteria than are available to individual investors (James and Karceski, 2006), and, as a result, they are classed as sophisticated investors (Collins *et* al., 2003). This set of characteristics (diversification, easier access to information and sophistication) makes institutional investors more willing to take greater risk in the hope of obtaining higher returns (Barinov, 2017; Bushee, 2001; Jensen and Meckling, 1976) which may contribute to creating a corporate risk-taking culture (Barry *et* al., 2011). With respect to the possibility of controlling risk-taking, several papers highlight the influence of institutional investors on management decision-making (Collins *et* al., 2003; Chiang *et* al., 2015; Wang *et* al., 2015; Pukthuanthong *et* al., 2017), and their role in monitoring managers (Evans and Fahlenbrach, 2012) to mitigate myopic and opportunistic behaviour and agency costs. Udin *et* al. (2017) and Switzer *et* al. (2018) cite managerial monitoring by owners as having an attenuating effect on the probability of default, as empirically supported by Bhojraj and Sengupta (2003).

Our aim is to determine whether fractional ownership with this type of composition creates agency problems or family firms are able to align the interests of all parties in the ownership structure and reach a consensus on investment criteria. The two types of shareholder (family and institutional owners) have different views on what makes a good investment and how much risk is worth taking. By investing their own wealth in the business, family owners become emotionally attached to the firm (Tilba and McNulty, 2013), whereas institutional investors are more detached and thus able to put their own aims above the firm's interests, and may urge the family to seek higher profit through risk-taking (George *et* al., 2005).

Schulze *et* al. (2003) acknowledge shortcomings in the AT explanation for agency problems in family firms with a degree of outside ownership, emphasizing the need to turn to behavioural economic theory. The SEW perspective shows that firms are not always risk averse, since risk-taking decisions depend on how they are framed. Family firms are more likely to take risks when their actual wealth is under threat, and less likely to do so in the absence of such a threat. In the presence of outside owners focused entirely on economic gain, family owners may see their non-economic goals under threat and move to protect their SEW, even though this could ultimately affect the firm's chances of survival. Combining these arguments, we posit that, in the presence of institutional investors willing to interfere in the management and control of the business, family owners take decisions that conflict with the goals of institutional investors and lead to higher default risk. Thus, our second hypothesis is:

H2a. The effect of family ownership on default risk is positively moderated by the significant presence of institutional owners.

The likelihood of family owners' protection of non-economic goals leading to conflicts with institutional investors can increase under certain conditions. Firstly, as Sakaki and Jory (2019) point out, the involvement of institutional investors depends not only on the proportion but also on the stability of their holdings. Thus, institutional investors can be typified by their degree of portfolio diversification and the depth of their investment horizon. Stable long-term institutional investors have strong incentives and more power to monitor companies internally (Pukthuanthong *et* al., 2017) while short-term, diversified institutional investors are more interested in obtaining short-term profits than in improving management (Jafarinejad *et* al., 2015). When institutional owners are motivated to take control of the firm's management, they are more likely to conflict with family shareholders. Based on the above reasoning, we predict that the conflict will be greater with institutional investors who have a large share of ownership and more permanent, long-term business goals, while the opposite will occur with more diversified, temporary institutional investors. Thus, we propose the following hypothesis:

H2b. The positive moderating influence of the significant presence of institutional owners in the family ownership – default risk relationship is greater in the case of long-term than short-term institutional owners.

Secondly, the SEW perspective suggests that, when business continuity is at risk, family firms will do anything they can to survive and thus preserve the non-economic wealth derived from the business (Gomez-Mejia *et* al., 2007). Under this premise, family firms' priorities and decisions change depending on their point of reference (situational factors) at different moments in time. As noted by Chrisman and Patel (2012), family businesses with large SEW endowments become more pro-active and take riskier decisions when unfavourable circumstances threaten the firm's survival. In order to save their SEW, family firms may avoid more traumatic measures by resorting to retrenchment strategies[2] (Casillas *et* al., 2019). They avoid dismissing personnel (Miller and Le Breton-Miller, 2005) and opt for internal rather than external transfer of ownership (Wennberg

[2] Retrenchment can be defined as the deliberate reduction of assets and/or costs as a means of increasing profits (Lim *et* al., 2013).

et al., 2011). Any alternative, that is, in the form of cut-back measures, may take their toll on relationships between the family and its employees (Miller *et* al., 2008), damage both the firm and the family reputation, convey signals of mismanagement and business failure, which is particularly alarming for family firms (Shepherd *et* al., 2009), or damage customer relationship and shake customer loyalty (Miller *et* al., 2008).

Therefore, we propose that under adverse circumstances, such as economic downturns, which threaten the SEW of family owners, the decisions they take in order to protect their non-economic goals clash more directly with institutional investors than they would under normal circumstances. Thus, we posit the following hypothesis:

H2c. The positive moderating influence of the significant presence of institutional owners in the family ownership – default risk relationship is greater during economic downturns than under normal economic conditions.

3. Database and Default Risk Measure

3.1. Database

The financial and market data for this study, which are drawn from the Thomson Financial database, refer to all stocks listed in the New York Stock Exchange (NYSE) for the period 2002-2016. After screening to remove banks, finance and insurance companies because of the peculiarities of their capital structure, which might skew the desired default risk data, the sample is limited to firms that checked YES in the "Primary quote" field and listings with Type not equal to Equity. The availability of data needed to calculate the BSM measure also had an impact, reducing the final sample to 1,132 companies.

The ownership data was taken from the Bureau Van Dijk Osiris database, which includes the number of voting rights per shareholder with more than 0.01% of the shares.

As well as the percentage of shares held, it also gives the type of investor for every year of the sample period.

Firms with no available data on the variables of interest (described in the methodology section) and outliers above and below the 99th and 1st percentiles, respectively, were removed. The selection is also restricted to companies with at least four years consecutive data, so as to enable computation of the m_2 statistic, as explained below. The final dataset comprises 541 companies and has a total of 4,271 observations for a 15-year study period.

3.2. Measuring Default Risk

As we have mentioned before, we are proxying default risk by using the so-called Black-Scholes-Merton measure, that has also been used by Vassalou and Xing (2004), Byström *et* al. (2005) and Byström (2006), among others. Thus, it starts from Merton's (1974) proposal, which is to consider the firm's own equity value as a European call option on its assets value, and then use the Black and Scholes (1973) formula to calculate the value.

The default probability is calculated as the probability that the firm's assets will be less than the book value of the firm's liabilities at debt's maturity. If the theoretical distribution implied by Merton's model is assumed, which is the Normal distribution, the theoretical probability of default is given by the following expression (see Vassalou and Xing, 2004):

$$P_{def,t} = N\left(-\frac{\ln \frac{V_{A,t}}{D_t} + \left(\mu_t - \frac{\sigma_{A,t}^2}{2} \right)(T-t)}{\sigma_{A,t}\sqrt{T-t}} \right) \tag{1}$$

where $V_{A,t}$ is the value of the firm's assets at time *t*, μ_t is the expected immediate rate of return on $V_{A,t}$, $\sigma_{A,t}$ is asset return volatility, D_t is the debt's face value, *T* is the maturity period and *N(·)* is the cumulative probability of the Normal distribution. Due to its derivational origin, this measure is also known as the Black-Scholes Merton or BSM measure.

To find the values of $V_{A,t}$ and $\sigma_{A,t}$ we use an iterative process starting from the market price of the firm's shares and its stock-return volatility, as one used by Abinzano *et* al. (2014). Furthermore, in line with other studies, we calculate the book value of debt as short-term debt plus 50% of long-term debt[3] and the time to maturity is set to one year[4]. Furthermore, we use the risk-free rate to obtain the implied asset value. Since we are considering default probability over the course of one year, we take the market yield on U.S. Treasury securities at one-year constant maturity for the whole of the study period. In keeping with the nature of the study, we use monthly data for the different variables. Following Vassalou and Xing (2004), we overcome the problem of reporting delays, by not using the book value of accounting variables for the new fiscal year until 4 months have elapsed.

Thus, the advantage of the BSM measure over accounting-based models is that, as well as considering past data it uses the market price of the shares, thereby incorporating investors' expectations for future share performance. It also takes into account asset return volatility. Hillegeist *et* al. (2004) compare it in this respect with Altman's (1968) Z and Ohlson's (1980) O-score, finding that the BSM measure provides significantly more

[3] Short-term debt is the Datastream variable "Short term debt & current portion of long term debt", which represents that portion of debt payable within one year including current portion of long term debt and sinking fund requirements of preferred stock or debentures, while long-term debt is Datastream's "Long term debt", which includes all interest bearing financial obligations, excluding amounts due within one year.

[4] See, for example, Crouhy *et* al. (2000), Vassalou and Xing (2004) and Gharghori *et* al. (2006).

information about the firm's default risk than either of the others. Consequently, they recommend the use of the BSM measure instead of traditional accounting-based measures as a default probability proxy. In addition to the advantages already explained in the introduction, with respect to the debt-related indicators, such as bond spreads or Credit Default Swaps spreads, and to credit rating, BSM requires only a minimum amount of information and are thus available for all firms, not just those that are credit-rated or have a CDS issued on them.

4. Methodology and Results

4.1. Estimation Method

In view of the lack of studies modelling the relationship between family ownership and default risk, this paper examines this association following Wang *et* al.'s (2015) proposal together with some of the control variables used in Chiang *et* al. (2015) and Wang *et* al. (2017). The model is estimated using panel data methodology.

Our benchmark model is given by the following equation:

$$DefaultRisk_{it} = \beta_0 + \beta_1 DefaultRisk_{i,t-1} + \beta_2 FamOwn_{i,t} + \beta_3 FamOwn_{i,t} * InstitOwn_{i,t} + \beta_4 InstitOwn_{i,t} + \varphi Control\ variables_{i,t} + Industry_j + \eta_{i,t} + u_{i,t} + \varepsilon_{i,t} \quad (2)$$

The dependent variable, $DefaultRisk_{i,t}$, is the default risk of firm *i* in year *t* proxied by the BSM measure (expression 1). $FamOwn_{i,t}$ is a continuous variable which captures the actual percentage of family voting rights in the firm[5]. The variable $InstitOwn_{i,t}$ is a

[5] *FamOwn* is measured as the percentage of voting rights owned by those shareholders catalogued in the database as "family" owners. Due to the database limitation, it is possible that the percentages of members pertaining to different families are summed together. Future research could start from an extended database which allows us to include the coexistence between family owners and another family group with a significant percentage in the business.

dummy variable which takes a value of one when the level of institutional ownership is high, i.e., above the mean; and zero otherwise. The interaction term is not included in Hypothesis 1, and the benchmark model is used to test Hypothesis 2a. In order to test Hypothesis 2b, following Bushee (2001) we substitute the variable $InstitOwn_{i,t}$ with two types of institutional investors, contrasting in terms of their portfolio diversification and stability. One is *bank trusts* (BT) and the other is *institutional advisors* (IA) including investment funds, private equity, venture capital and hedge funds. BT and IA are dummy variables that take the value 1 if the participation of bank trusts or that of institutional advisors, respectively, are above the mean, and zero otherwise. Finally, finding the financial crisis of 2008 to provide an interesting context for analysing the effect of an economic downturn placing firms in difficult circumstances, we introduce a dummy variable, $Crisis_t$, which takes a value of 1 for the years 2008 and 2009, and zero otherwise, enabling us to test Hypothesis 2c.

The model also includes a set of control variables based on what the literature has considered the determinants of default risk (Blume *et* al., 1998; Kaplan and Urwitz, 1979). The first of these control variables, *SIZE*, measured as the natural logarithm of total assets in thousands, represents firm size, which is expected to be positively related to default risk. The second is, *ROA*, the return on assets, which represents firm profitability. Firms drawing higher revenue from their operating activities will generate higher profits and therefore present less default risk. *LEV* represents firm leverage measured as the ratio of debt to total assets, with higher debt ratios generating higher levels of default risk. *VOLAT is* the variability of returns measured as the standard deviation of the stock returns for the past twelve months. Since higher variability will lead to higher risk, the relationship with default risk is expected to be positive. *CAPEX,* capital expenditure, is the variable used to represent the costs of funds, measured by the ratio of interest expenses and cash dividends to total asset. Higher values of *CAPEX* are expected to be associated with higher default risk. The model includes the lagged value of the dependent variable, as in previous papers on default risk (Hsu *et* al., 2015; Wang *et* al., 2015; Wang *et* al., 2017) because it is persistent over time. Industry dummies are also included.

The use of panel data methodology enables controlling for individual heterogeneity (individual effect, $\eta_{i,t}$) and for time heterogeneity ($u_{i,t}$), measured by the time dummy variables. The model also includes a random disturbance term, $\varepsilon_{i,t}$. The dynamic model is estimated using the Generalized Method of Moments (GMM); more specifically, the system GMM, which provides a consistent, and efficient estimator (Arellano and Bond, 1991) using instrumental variables and a two-step estimator with robust standard errors. This provides a means to address potential endogeneity of the explanatory variables in the model, controlling two possible sources (Wooldridge, 2010), omitted variables and reverse causality. In addition, the third source of endogeneity, measurement error, may be solved by using the best proxies to quantify the model variables. The recognized advantages of the BSM default-risk measure help to minimize this problem. The choice of instruments in this case is based on the need to comply with two conflicting requirements: exogeneity and strength (Wintoki *et* al., 2012). In order to decide how many lags to use as instruments, we take into account these two requirements. If the lags are longer, the instruments will be more exogenous but also weaker. Therefore, we choose conservative instruments, using the lags from *t-2* to *t-5*, and from *t-1* to *t-4* for the dependent and the explanatory variables, respectively, in the equations in differences. For the equations in levels we use the lag in *t-2* and *t-1* for the dependent and explanatory variables, respectively.

Some specification tests are also included. One is the Hansen statistic, which is used to detect over-identifying restrictions by testing for the absence of correlation between the instruments and the random disturbance and is asymptotically distributed as χ^2. First- and second-order serial correlation tests, m_1 and m_2, respectively, indicate the absence of correlation between the residuals in first differences. The tests are asymptotically distributed as N (0,1) under the null of no serial correlation. The m_2 statistic is calculated following Arellano and Bond (1991).

The analysis also includes Wald tests of the joint significance of the explanatory variables (z_1), the time dummy variables (z_2), and industry dummy variables (z_3), respectively. These statistics are asymptotically distributed as a χ^2 under the null hypothesis of no joint significance.

4.2. Results

Table 1 contains the mean, standard deviations and correlations, for the variables used throughout the study. With respect to our main variable of interest, *FamOwn*, it can be seen that, on average, families hold 11% of the firm's voting rights, while institutional investors hold 66%. According to results reported by Jafarinejad *et* al. (2015), the proportion of institutional ownership in the U.S. market ranges from 60% in the 2000s to 66% by the end of 2010, which is in line with our data. Furthermore, the percentage of shares held by bank trusts (38%) is higher on average than that held by institutional advisors (21%). The correlation matrix shows that family ownership is negatively correlated with both default risk and institutional holdings. Overall, the correlations among the explanatory variables are not too high and the variance inflation factor is less than 5 for all the variables included in each model, thus ruling out multicollinearity.

[Insert Table 1 about here]

Panel A in Table 2 gives the differences in the mean values of the variables between companies with significant (5% threshold) vs. low family ownership. One noteworthy observation is that default risk is lower in firms with significant levels of family ownership, as is the level of institutional ownership. Family-owned firms are also smaller, less indebted, less volatile and less burdened with capital expenditures. Panel B in Table 2 compares the mean values of the variables between companies with high vs. low (i.e., above- vs. below-average) institutional ownership percentages. Lower default risk is observed in firms with high institutional presence, although the difference is not statistically significant. The results show that, on average, companies with higher institutional ownership are larger, more volatile, and less burdened with capital expenditures, and also have lower family ownership percentages.

[Insert Table 2 about here]

Table 3 shows the results from the estimation of the model (equation 2), which analyses the relationship between default risk, and family ownership. The first column shows the results without institutional investor effects, while column two shows those obtained when institutional ownership is considered. The negative coefficient of family ownership found in the reported estimations supports Hypothesis 1 by confirming the predicted role of family owners in reducing default risk.

[Insert Table 3 about here]

Column 3 presents the results for the moderating effect of institutional ownership. The coefficients of family ownership (-0.0185) and the institutional ownership dummy (-0.0131) are negative and significant. The results also show that institutional ownership positively moderates the effect of family ownership on default risk (0.0287). Thus, the effect of the presence of family shareholders is to increase default risk in firms where the level of institutional ownership is high (0.0102) and reduce default risk in those where it is low (-0.0185). The coefficients on the effect of family ownership on default risk for each group is summarised in the Appendix. This result supports Hypothesis 2a that ownership by institutional investors moderates the default risk-reducing effect of family ownership, as conflicts caused by fractional ownership and the family's SEW lead family owners to the undue appropriation of funds.

As already stated, in testing Hypothesis 2b, we consider two types of institutional investors with contrasting degrees of investment stability: bank trusts and institutional advisors. Table 4 shows the results of the estimation of the model when the variable $InstitOwn_{i,t}$ is replaced with two dummies, BT and IA. Columns 1 and 2 show the positive moderating role of bank trusts and institutional advisors, respectively. In other words, higher levels of institutional ownership lead family owners towards higher levels of default risk. To check for differences between the two investor types, Column 3 shows the results of the estimation including both types and their interactions with family ownership. The default risk-intensifying effect of family ownership is found to be greatest when both types of shareholdings are high (0.033) and to be at its lowest when both are low (-0.0204). Furthermore, in support of Hypothesis 2b, it is found to increase more when a significant share is held by bank trusts (0.0210) than when institutional advisors play a prominent role (-0.0085). Significantly, therefore, it emerges that, whereas, in the presence of bank trusts, family ownership is positively related to default risk, in the presence of institutional advisors, the relationship remains negative. This result suggests, overall, that investors are predisposed to participate in firm management and that family owners come into greater conflict for control of the business with stable than with short-term institutional investors.

[Insert Table 4 about here]

Finally, Table 5 shows the findings for Hypothesis 2c. The results shown in column 1 indicate that a more significant presence of institutional investors intensifies the family ownership effect on default risk to a greater extent during the financial crisis (0.0455) than during the rest of the period (0.0133). This provides support for Hypothesis 2c, which predicts that, under economic downturns, family owners' action to protect their SEW conflicts with the purely economic goals of institutional investors, and default risk thus increases. These results are in line with previous studies reporting a positive association between family firms and economic downturns. For instance, Alonso-Dos Santos and Llanos-Contreras (2019) document that a major shock can provoke family firms to make riskier decisions. Lins *et* al. (2013) and Zhou *et* al. (2017) observe that family-controlled firms underperform significantly during the 2008-2009 financial crisis. Lins *et* al. (2013) show that, in times of financial shocks, family firms are driven by their survival instinct to reduce asset expenditure and invest in ailing businesses belonging to the family, thereby diluting the equity value of outside shareholders. Zhou *et* al. (2017) also find evidence of disinvestment by family firms during times of crisis, claiming that unqualified family members lead to unqualified management, the consequences of which emerge in adverse economic conditions.

[Insert Table 5 about here]

Our results also show that, although, during the financial crisis, the family ownership effect on default risk was at its highest in firms with high proportions of institutional shareholders (0.0455), it was at its lowest in those without (-0.0213). This suggests that family owners' action to protect their SEW does not increase the firm's default risk unless it creates conflict with other significant investors. This is in line with previous arguments regarding the resilience of family owners when faced with adversities. According to AT, companies with family ownership typically obtain better terms in debt-contracts (Anderson *et* al., 2003) thereby easing solvency pressures and financial flexibility, as observed by Crespi and Martin-Oliver (2015). Therefore, the predicted reaction of family-owned firms to adverse circumstances varies with the presence/absence of potential conflict in family firms with large institutional holdings.

Column 2 in Table 5 gives the combined results for Hypotheses 2b and 2c which relate to possible variation in the effect of family ownership on default risk between the crisis and non-crisis periods in firms with a significant presence of both types of institutional investors. The results show that, whereas during the financial crisis the default risk-intensifying effect of family ownership is greater (0.038) in firms with a significant presence of institutional advisors than those with significant levels of bank-trust ownership (0.007), the reverse effect occurs during the non-crisis period, when the coefficients are 0.032 for bank trust ownership and -0.012 for the presence of institutional advisors. This is in line with the findings of Switzer and Wang (2017) who find that during the financial crisis the positive effect of long-term institutional investors on CDS spreads, is reduced, while the effect of short-term institutional investors is increased. They suggest that stable institutional investors have fewer risk-shifting incentives during the crisis, when their greatest concern is for the firm's survival. Thus, it is during the crisis period that family owners and bank trusts align their interests, thereby reducing their conflicts and, consequently, default risk (0.007 vs. 0.032). The opposite occurs with institutional advisors, whose short-term orientation and lack of other business ties to preserve (Sakaki and Jory, 2019) lead them into greater conflict with family owners during the crisis, thereby increasing default risk (0.038 vs. -0.012).

5. Robustness Checks and Extensions

5.1. Endogeneity Issues

Although the system GMM has been proved to deal both with omitted variables and reverse causality issues, the reverse causality between family ownership and default risk is a major source of endogeneity requiring special attention. We address this issue using instrumental variables two-stage least square (IV-2SLS) estimation as in Lee *et* al. (2018) or Anderson and Reeb (2003a), among others. Following Faccio *et* al. (2011), Nguyen (2011) and Lee *et* al. (2018), we use two instrumental variables for family ownership: average family ownership across all other firms in the same industry, and the natural logarithm of the firm's age. As explained in the cited works, these instruments are exogenous and closely related to the firm's family ownership. We present the results of the estimation in Table 6. As can be observed, the results are, overall, consistent with and similar to our prior results. The effect of family ownership is significant and positively moderated by the significant presence of institutional investors. We also find that the moderating influence of institutional ownership is greater in the case of long-term institutional owners and during economic downturns.

[Insert Table 6 about here]

5.2. Alternative Measures of Default Risk

5.2.1. BSM specifications

When applying expression (1) to estimate the probability of default, notice that we need to know debt maturity, *T*, and face value of debt, *D*. Given that most companies have various debts with different maturities, it is necessary to aggregate all debts into a single zero-coupon bond, to enable application of the Black and Scholes (1973) option pricing model.

With respect to the first selected variable, debt maturity, as far as we know, all papers using the BSM model use T = 1 year (see among others Crouhy *et* al., 2000; Crosbie and Bohn, 2003; Hillegeist *et* al., 2004; Vassalou and Xing, 2004 and Gharghori *et* al., 2006). Moreover, Gharghori *et* al. (2006) indicate that a maturity of more than one year is difficult to justify. In addition, KMV shows a sharp increase in the slope of the probability of default only between 1 and 2 years prior to default (see Crouhy *et* al., 2000). Thus, we select T=1 in our main analysis.

With respect to the default point, Vassalou and Xing (2004) follow KMV by using 50 percent of long-term debt. Another reason for their decision, as pointed out by Crouhy *et* al. (2000), is that Moody's KMV sets the default point at the par value of short-term debt plus half the long-term debt, having observed, in a sample of several hundred companies, that firms default when their asset value reaches a point somewhere between the value of their total liabilities and that of their short-term debt. Following these ideas, we also take, in our main analysis, default point as short-term debt plus half the long-term debt.

However, Vassalou and Xing (2004) noted that the amount of long-term debt to be entered is arbitrary. Therefore, we examine whether the choice of default point affects the estimation of our hypotheses. Panels A and B in Table 7 offer a summary of the different estimations when considering T = 1 default probability and two different default point alternatives, specifically taking into account half of the short-term debt plus the whole of the long-term debt, as in Chiang *et* al. (2015), and with the default point as the whole of the debt, as in Crosbie and Bond (2003) and Hillegeist *et* al. (2004). The results can be seen to hold with respect to those obtained when proxying the default point with short-term debt plus half the long-term debt.

[Insert Table 7 about here]

5.2.2. Alternatives to BSM: Shortfall

As an alternative to the BSM measure, we can consider other measures of credit risk. Specifically, in order to consider the tail risk, we use the firm's shortfall, measured as the logarithm of the firm's default point divided by the market value of its assets, in order to quantify the difference between the due outstanding liabilities and the asset value. The default point, as in the main analysis, is calculated as the short-term debt plus half of the long-term debt, and the total assets market value is proxied by the variable $V_{A,t}$ obtained by applying the Black-Scholes-Merton model, and also used in expression (1). As can be inferred, larger shortfalls are associated with greater default severity. The results obtained using shortfall as the dependent variable, which are summarised in Panel C in Table 7, are consistent with those obtained with the BSM default probability, for all four hypotheses.

5.2.3. Alternatives to BSM: Distance to Default

Another alternative to using the probability of default given by expression (1) is to proxy default risk with the distance to default, given by the opposite of the inverse Normal distribution of default probability, obtaining in this way an unbounded credit risk measure. Given that the interpretation of the distance to default measure is the opposite of that of default probability, that is, the greater the distance to default, the lower the default risk, we have taken its opposite. We have repeated the analysis using distance to default instead of default probability and Panel D in Table 7 summarises the results. The sign and coefficients of the principal variables of the analysis remain unchanged.

5.3. Giant Companies Led by a Strong Leader

The leadership skills of some managers and/or shareholders is a distinctive firm characteristic that relates to the subject of this paper, which is family ownership (and its management control capacity) in coexistence with institutional ownership. The level of leadership skills could possibly affect the coexistence of different types of investors. In order to consider this aspect, we have selected a subgroup of companies fulfilling the condition of being giant companies led by a leader. Companies led by a strong leader are identified on the basis of information contained in Forbes' article "Most innovative leaders"[6]. Next, status as a giant company is determined based on their inclusion in the S&P 500 index. This provided us with a subgroup of 15 companies with which to repeat the main analyses using a pooled data least squares regression.

As can be seen in Panel A of Table 8, the main results hold for the subgroup of giant companies led by a strong leader. Family ownership clearly reduces default risk and, this effect is moderated by the coexistence of family and institutional investors. With respect to the results for the individual influence of different types of institutional investors, there is no significant interaction with the most stable institutional investors (BT). This may be related to the fact that, due to their strong charisma, the leaders of these companies encounter only short-term institutional investors (IA). The results for the model including the crisis effect show that, while default risk is reduced both by family and institutional ownership during the crisis, their coexistence has no significant impact. Again, this lack of significance may be due to the leader's ability to prevail at critical moments[7]. Note that certain characteristics of this subgroup are closely associated with board behaviour. Specific aspects of board characteristics, not closely examined here, would provide an interesting topic for future research using more detailed and widely sourced data.

[Insert Table 8 about here]

To check for the potential influence of this subgroup on our initial results, we repeat the analysis excluding giant companies led by a strong leader. Panel B of Table 8 also summarises the results obtained, and they are like those for the whole sample. Thus, we can confirm that our main results are not biased by that set of companies.

[6] https://www.forbes.com/lists/innovative-leaders/#4fbd06426aa9

[7] The number of coefficients to be estimated in the last two models increases considerably. Therefore, caution is required when interpreting the results from few observations.

5.4. Family Ownership, Risk-Taking and Default Risk Relationships

In our main analysis we first assume a link between family ownership and risk-taking, and then with default risk. However, the paths of this relationship are likely to be complex. In this section we try to develop these aspects more fully.

According to Hiebl (2012), the propensity of the family to assume risk is not clear since it seems to depend on several factors that may have counteracting effects. Some of them may be the family's involvement, goals and behaviours, family manager characteristics, firm characteristics or the environment (La Porta *et* al., 1999) and competition (legal protection of minority shareholders, Burkart *et* al., 2003, or their loss aversion, rather than on their risk aversion, Gomez-Mejia *et* al., 2007).

Firstly, in his meta-analysis Hiebl (2012) indicates that most papers show family firms to be more risk-averse than non-family firms. This risk-aversion is explained by the high degree of family involvement in the business (Memili *et* al., 2011; Le Breton-Miller *et* al., 2011; Anderson *et* al., 2012), the family's long-term orientation aimed at achieving the firm's survival (Lumpkin *et* al., 2010; Bianco *et* al., 2013) and the undiversified portfolio of family owners (Morck and Yeung, 2003; Zellweger and Sieger, 2012). However, some studies find that family firms are willing to accept the risk involved in their strategies in order to achieve competitive advantages, which bring performance gains but also higher risk (Anderson and Reeb, 2003a; Maury, 2006; Villalonga and Amit, 2006; Nguyen, 2011). In answer to this controversy, some studies suggest that the relationship between risk-taking and family ownership might not be linear, assuming instead that higher levels of risk are a feature of higher levels of ownership (Anderson and Reeb, 2003b, or Lee *et* al., 2018).

Secondly, the relationship between risk-taking and default risk, that is, how risk-taking translates into default risk, is not obvious. The family's risk aversion measured by its risk-taking activities leads to several firm outcomes, such as capital structure, business strategy (kind and time of investments) or performance, as explained by Hiebl (2012). Indeed, Hoskisson *et* al., (2017) show that some risk-taking measures can alternatively identify the same factor either as a driver or as an inhibitor of firm risk.

Default risk includes operational and financial risks arising from two areas of firm risk-taking decisions closely linked to default risk: namely, financing (capital structure) and investment (business strategy). With respect to financing decisions, there are two opposing perspectives; some papers find that family firms are risk-averse, and thus present lower indebtedness (De Angelo and De Angelo, 2000), while others find a positive relationship between family ownership and leverage (Croci *et* al., 2011 or Keasey *et* al., 2015), which they interpret as a preference of public family businesses for debt versus equity financing. When it comes to investment decisions, family shareholders are likely to favour projects that will enable the continuity of the company, avoid high-risk investments and pursue long-term plans (Miller *et* al., 2008; Anderson *et* al., 2012). Family firms are generally less inclined to invest in risky projects such as R&D (Croci *et* al., 2011; Anderson *et* al., 2012; Su and Lee, 2013) or to engage in internationalization plans (George *et* al., 2005) and they also have higher levels of capital expenditures (Le Breton-Miller *et* al., 2011 or Anderson *et* al., 2012). In general, riskier investment policies increase the probability of business failure (Kuang and Qin, 2013), but even cautious investment decisions can have a negative impact on performance, since they might result in missed opportunities for firm growth. There is also a lack of consensus in the literature as to the nature of the relationship between investment horizons and risk, long-term projects being associated with uncertainty and increased risk (Rottke and Thiele, 2018).

Our selected measure of default risk captures the effect of risk-taking on different firm outcomes, namely, capital structure, performance and investment expectations, by taking firm's leverage, expected rate of return and market value of assets as inputs. Given the lack of papers directly analysing firms' credit risk, the possibility of a relationship between family ownership, risk-taking and default risk is an empirical question.

Following previous papers (Lee *et* al., 2018; Nguyen, 2011 and 2012), we measure the firm's business risk or risk-taking using total risk (measured as the annualized standard deviation of daily stock returns during the past twelve months), and idiosyncratic risk (measured as the annualized standard deviation of the residuals of Fama-French 3-factor model and of the CAPM model). We first analyse the effects of family ownership on risk-taking, and then the effect of risk-taking on default risk. In unreported analyses, available from the authors upon request, we find that, in line with our main arguments and results, one way by which family ownership reduces the firm's credit risk is by reducing risk-taking. However, default risk is a wider concept, which also encompasses the capacity to generate future resources. Future research might therefore attempt further elaboration of the concept by using various alternative measures of risk-taking and taking into account the various potential effects of the particularities of family-owned firms, such as multi-generational ownership, the presence of non-family managers, the age and tenure of family managers or family ownership concentration, among others.

5.5. Family Ownership and Default Risk: Non-Linear Relationship

The coexistence of family and institutional owners and its effect on default risk is a form of non-linear relationship between family ownership and default risk based on the proportion of institutional ownership. However, there may exist another non-linear relationship between family ownership and default risk based on the proportion owned by the family.

We study the possibility of a non-linear relationship between family ownership and default risk following Lee *et* al. (2018)[8]. Table 9 shows the results of the estimations. We find a non-linear relationship between family ownership and default risk using the two alternatives applied by Lee *at* al. (2018). With the quadratic alternative, the inflexion point is 63.08%. That is, credit risk decreases with family ownership stakes below 63.08%, but starts to increase with stakes beyond that level. These results support a non-linear relationship between family ownership and default risk similar to that indicated by other relationships between family ownership and risk-taking, (Lee *et* al., 2018); performance (Anderson and Reeb, 2003a); or managerial control (Burkart *et* al., 2003). Thus, our results indicate that the dampening effect of family ownership on default risk disappears with the family's entrenchment. This is in line with the seminal work of Shleifer and Vishny (1997) which describes the entrenchment of major shareholders having obtained almost full control of the company and acquired the power to expropriate minority shareholders by pursuing their own private benefits. The maximization of private benefits, rather than firm value, will then increase the probability of business failure.

[Insert Table 9 about here]

These results suggest that the effect of family ownership on default risk is not uniform since it varies with the size of the family's stake in total ownership. This analysis may provide an opportunity for future in-depth research of the non-linear relationship between the proportion of shares owned by the family and the firm's credit risk. Additional possibilities would be to study this effect based on the generation effect (first

[8] We test this relationship in two different ways. The first is to include the square of family ownership in the regression. The second is to include two variables, *Fam0_to_50*, which equals FamOwn if FamOwn is lower than 50.1%, and 50.1% otherwise; and *Fam_over_50*, which equals FamOwn – 50.1%, if family ownership is larger than 50.1% and 0 otherwise.

versus second) or the family's relationship with other investors, such as another family group with a significant percentage in the business, or foreign investors.

6. Conclusions

Default risk involves various facets of a firm, including firm performance, leverage and the capacity to generate future resources, all of which shape the firm's situation and contribute to the construction of a corporate risk estimate. Thus, rather than studying the risk-taking decisions of family owners themselves, through their policies on innovation, R&D investment, leverage, etc., this paper analyses the outcome of the risk-taking activities, measured by the company's default risk, that is, the probability of the business to fail. The central issue of this paper is to explain how the role of family owners in default risk is influenced by co-ownership with institutional investors, since conflict can arise between these two groups of investors, who have different aims for the firm. In investigating this relationship, we also take into account the type of institutional investors and the effect of an economic downturn.

Based on a sample of 541 public U.S. firms for a 15-year period and proxying default risk with the Black-Scholes-Merton model, this paper confirms the expected negative relationship between family ownership and default risk. This first finding is consistent with the AT and the SEW perspective that predict family owners to have a greater capacity to monitor managers and the firm's choices, a risk-averse profile, a long-term goal horizon, an emotional attachment to the business, and a deep concern for firm survival.

The results further indicate that this inverse relationship is not immutable. The presence of institutional investors makes family shareholders more protective of their SEW and prone to take decisions in misalignment with their co-owners, thereby increasing the firm's default risk. The conflict intensifies in the presence of stable institutional investors who are more motivated to control management; and when adverse financial circumstances increase the disparity of interests between the two groups of investors.

Overall, this analysis extends previous evidence on default risk, taking into account the role played by ownership structure, particularly with respect to family shareholders, which appear to be important determinants. We also highlight the danger of relying on simplistic classifications, given that factors which pose a threat to the family's non-economic goals appear to play a decisive role in the analysis.

This paper has various implications. From the academic perspective, the results suggest that, as well as the traditional variables, measures of default risk should also include some relating to investor behaviour. This is especially relevant for firms with significant family ownership, where risk-taking decisions with repercussions for default risk are driven not only by financial factors but also by non-economic goals. Regulatory and policy implications can also be drawn, since rules and policies encouraging specific ownership structures would help to reduce default costs and financial costs in the global economy. To the extent that they can be adopted in other contexts, some family-firm characteristics might help to control default risk both in the corporate sector and in the economy as a whole.

Appendix. Summary of the effect of family ownership on default risk

Table A1. The Effect of Family Ownership on Default Risk for Different Levels of Institutional Ownership

Institutional Ownership	
High	Low
0.0102 (1+2)	-0.018 (1)

This table presents the effect of family ownership on default risk for high and low levels of institutional ownership. The coefficients, shown in parentheses, are obtained from Table 3, column 3.

Table A2. The Moderating Effect of Institutional Ownership on the Family Ownership-Default Risk Relationship for Different Types of Institutional Investors

		Bank Trusts	
		High	Low
Institutional Advisors	High	0.0333 (1+2+3+4)	-0.0085 (1+3)
	Low	0.021 (1+2)	-0.0204 (1)

This table presents the effect of family ownership on default risk for high and low ownership by different types of institutional investors. The coefficients, shown in parentheses are obtained from Table 4, column 3.

Table A3. The Moderating Effect of Institutional Ownership on the Family Ownership-Default Risk Relationship for Crisis and Non-crisis period

		Financial Crisis	
		Yes	No
Institutional Ownership	High	0.0455 (1+2+5+6)	0.0133 (1+2)
	Low	-0.0213 (1+5)	0 (1)

This table presents the effect of family ownership on default risk for high and low levels of institutional ownership for the crisis and non-crisis period. The coefficients, shown in parentheses, are obtained from Table 5, column 1.

Table A4. The Moderating Effect of a Significant Level of Institutional Ownership on the Family Ownership-Default Risk Relationship for Different Types of Institutional Investors and for the Crisis and Non-crisis period

		Financial Crisis	
		Yes	No
Type of Institutional Investor	Bank Trusts	0.007 (1+3+5+7)	0.032 (1+3)
	Institutional Advisors	0.038 (1+4+5+8)	-0.012 (1+4)

This table presents the effect of family ownership on default risk for high levels of different types of institutional ownership during the crisis and non-crisis period. The coefficients, shown in parentheses, are obtained from Table 5, column 2.

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Table 1. Summary Statistics and Correlation Matrix

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Default risk	0.01	0.08									
2. FamOwn	0.11	0.17	-0.04***								
3. InstitOwn	0.66	0.31	0.02	-0.34***							
4. Bank Trust	0.38	0.18	-0.03**	-0.24***	0.83***						
5. Institutional Advisors	0.21	0.17	0.08***	-0.29***	0.76***	0.34***					
6. Size	14.60	1.24	0.00	-0.18***	0.08***	0.11***	-0.03**				
7. Roa	0.03	0.06	-0.26***	0.02*	-0.04***	0.02*	-0.14***	-0.05***			
8. Leverage	0.29	0.19	0.17***	-0.07***	-0.01	-0.01	-0.00	0.30***	-0.27***		
9. Volatility	0.34	0.17	0.40***	-0.03**	0.11***	0.00	0.18***	-0.21***	-0.27***	-0.03**	
10. Capex	0.03	0.02	0.05***	-0.07***	-0.14***	-0.09***	-0.18***	0.12***	-0.02	0.54***	-0.14***

This table displays mean, standard deviation (SD) of the variables and their correlation. ***, ** and * denote coefficients that are significant at the 1, 5 and 10 per cent level, respectively.

Table 2. Differences of Means Tests

Panel A. High versus Low Family Ownership (5% threshold)			
	High	**Low**	**t-statistic**
$Default\ Risk_{it}$	0.0128	0.0189	2.3051**
$SIZE_{it}$	14.3424	14.7812	11.4357***
ROA_{it}	0.0417	0.0387	-1.4929
LEV_{it}	0.2714	0.3030	5.1012***
$VOLAT_{it}$	0.3324	0.3508	3.3273***
$CAPEX_{it}$	0.0319	0.0363	4.8327***
$InstitOwn_{it}$	0.5237	0.7534	24.5509***
Panel B. High versus Low Institutional Ownership			
	High	**Low**	**t-statistic**
$Default\ Risk_{it}$	0.0157	0.0175	0.6873
$SIZE_{it}$	14.7239	14.4589	-6.9434***
ROA_{it}	0.0404	0.0393	-0.5723
LEV_{it}	0.2870	0.29530	1.3450
$VOLAT_{it}$	0.3526	0.3317	-3.8296***
$CAPEX_{it}$	0.0311	0.0391	9.0468***
$FamOwn_{it}$	0.0585	0.1799	23.3140***

Panel A contains the differences on the model's variables between firms with more than 5% family ownership (39.19 % observations), and firms with lower family ownership (60.81%). Panel B contains the differences on the model's variables between firms with high institutional ownership (56.73 % observations), and firms with low institutional ownership (43.27%). The *t*-statistic is the difference of means test under the null hypothesis H_0: $mean_{high}$ - $mean_{low}$ = 0. *** and ** denote coefficients that are significant at the 1 and 5 per cent levels, respectively.

Table 3. Default Risk, Family Ownership and Institutional Ownership

Dep. var.: Default Risk$_{i,t}$	**1**	**2**	**3**
Default Risk$_{i,t-1}$	0.1795***	0.1750***	0.1719***
	(0.0032)	(0.0025)	(0.0018)
FamOwn (1)	-0.0057***	-0.0113***	-0.0185***
	(0.0013)	(0.0010)	(0.0007)
FamOwn*InstitOwn (2)			0.0287***
			(0.0009)
InstitOwn		-0.0072***	-0.0131***
		(0.0005)	(0.0004)
SIZE	0.0061***	0.0040***	0.0022***
	(0.0005)	(0.0003)	(0.0002)
ROA	-0.1485***	-0.1467***	-0.1445***
	(0.0051)	(0.0032)	(0.0023)
LEV	0.0375***	0.0395***	0.0486***
	(0.0029)	(0.0021)	(0.0015)
VOLAT	0.1682***	0.1686***	0.1700***
	(0.0033)	(0.0025)	(0.0020)
CAPEX	0.2644***	0.2229***	0.2460***
	(0.0130)	(0.0090)	(0.0071)
Const.	-0.1455***	-0.1134***	-0.0908***
	(0.0075)	(0.0052)	(0.0037)
Wald tests			
w_1			155.69***
z_1 (p-value)	(0.000)	(0.000)	(0.000)
z_2 (p-value)	(0.000)	(0.000)	(0.000)
z_3 (p-value)	(0.000)	(0.000)	(0.000)
Specification tests			
m_1 (p-value)	(0.039)	(0.041)	(0.029)
m_2 (p-value)	(0.606)	(0.651)	(0.520)
Hansen (p-value)	(0.025)	(0.309)	(0.463)

This table presents the coefficients of the estimation with the system GMM. The dependent variable is the probability of default given by the Black-Scholes-Merton model. Time and sector dummies are included but not reported. Robust standard errors are in parenthesis. W_1 is a Wald lineal restriction test, where the null hypothesis states that the sum of the coefficients of family ownership and its interaction with institutional ownership is equal to zero. z_1, z_2 and z_3 are Wald tests of the joint significance of the explanatory variables, the time, and sector dummies, respectively. m_i is an i^{th} order serial correlation test using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation. Hansen is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of no correlation between the instruments and the error term. *** denotes coefficients that are significant at the 1 per cent level.

Table 4. Default Risk, Family Ownership and Type of Institutional Investor

Dep. var.: Default Risk$_{i,t}$	**1**	**2**	**3**
Default Risk$_{i,t-1}$	0.1721***	0.1673***	0.1762***
	(0.0013)	(0.0019)	(0.0021)
FamOwn (1)	-0.0100***	-0.0191***	-0.0204***
	(0.0004)	(0.0007)	(0.0011)
FamOwn*Bank Trust (2)	0.0397***		0.0415***
	(0.0006)		(0.0019)
FamOwn*Institutional Advisor (3)		0.0345***	0.0119***
		(0.0011)	(0.0021)
FamOwn*Bank Trust* Institutional Advisor (4)			-0.0035
			(0.0032)
Bank Trust	-0.0098***		0.0109***
	(0.0002)		(0.0009)
Institutional Advisor		-0.0130***	-0.0168***
		(0.0004)	(0.0008)
Bank Trust * Institutional Advisor			-0.0129***
			(0.0006)
SIZE	0.0025***	0.0044***	0.0013***
	(0.0001)	(0.0002)	(0.0003)
ROA	-0.1535***	-0.1554***	-0.1511***
	(0.0019)	(0.0025)	(0.0037)
LEV	0.0467***	0.0340***	0.0252***
	(0.0010)	(0.0016)	(0.0016)
VOLAT	0.1834***	0.1767***	0.1747***
	(0.0010)	(0.0017)	(0.0027)
CAPEX	0.2118***	0.2437***	0.2884***
	(0.0050)	(0.0069)	(0.0102)
Const.	-0.0994***	-0.1195***	-0.0721***
	(0.0024)	(0.0031)	(0.0043)
Wald tests			
w_1	3,432.75***		167.58***
w_2		305.62***	21.02***
w_3			146.81***
z_1 (p-value)	(0.000)	(0.000)	(0.000)
z_2 (p-value)	(0.000)	(0.000)	(0.000)
z_3 (p-value)	(0.000)	(0.000)	(0.000)
Specification tests			
m_1 (p-value)	(0.033)	(0.034)	(0.041)
m_2 (p-value)	(0.469)	(0.558)	(0.523)
Hansen (p-value)	(0.416)	(0.490)	(0.440)

The dependent variable, estimation method and specification tests are explained in Table 3. w_i are Wald lineal restriction tests. The null hypothesis of w_1 states that the sum of the coefficients of family ownership and its interaction with bank trust is equal to zero. The null hypothesis of w_2 states that the sum of the coefficients of family ownership and its interaction with institutional advisors is equal to zero. The null hypothesis of w_3 states that the interaction of family ownership with bank trust minus the interaction of family ownership with institutional advisors is equal to zero. *** denotes coefficients that are significant at the 1 per cent level.

Table 5. Default Risk, Family Ownership, Institutional Investors and Financial Crisis

Dep. var.: Default Risk$_{i,t}$	1	2
Default Risk$_{i,t-1}$	0.1315***	0.1483***
	(0.0015)	(0.0033)
FamOwn (1)	0.0001	0.0095***
	(0.0006)	(0.0010)
FamOwn*InstitOwn (2)	0.0133***	
	(0.0010)	
FamOwn*Bank Trust (3)		0.0232***
		(0.0019)
FamOwn*Institutional Advisors (4)		-0.0221***
		(0.0022)
FamOwn*Crisis (5)	-0.0213***	-0.0627***
	(0.0034)	(0.0046)
FamOwn*InstitOwn*Crisis (6)	0.0535***	
	(0.0045)	
FamOwn*Bank Trust*Crisis (7)		0.0373***
		(0.0059)
FamOwn*Institutional Advisors*Crisis (8)		0.1136***
		(0.0078)
InstitOwn*Crisis	-0.0278***	
	(0.0016)	
Bank Trust * Crisis		-0.0133***
		(0.0022)
Institutional Advisors * Crisis		0.0012
		(0.0020)
InstitOwn	-0.0036***	
	(0.0003)	
Bank Trust		-0.0037***
		(0.0006)
Institutional Advisors		-0.0047***
		(0.0006)
Crisis	0.0199***	0.0062***
	(0.0014)	(0.0022)
SIZE	0.0040***	0.0033***
	(0.0002)	(0.0003)
ROA	-0.1418***	-0.1561***
	(0.0025)	(0.0051)
LEV	0.0569***	0.0412***
	(0.0015)	(0.0025)
VOLAT	0.1777***	0.1807***
	(0.0018)	(0.0025)
CAPEX	0.2403***	0.2880***
	(0.0072)	(0.0139)
Const.	-0.1284***	-0.1208***
	(0.0041)	(0.0044)
w_1	316.61***	
w_2		31.38***
z_1 (p-value)	(0.000)	(0.000)
z_2 (p-value)	(0.000)	(0.000)
m_1 (p-value)	(0.009)	(0.016)
m_2 (p-value)	(0.349)	(0.421)
Hansen (p-value)	(0.364)	(0.265)

The dependent variable, estimation method and specification tests are explained in Table 3. Sector dummies are included but not reported. W_i are Wald lineal restriction tests. The null hypothesis of w_1 states that the sum of the coefficients of the interaction of family ownership with institutional ownership, the interaction of family ownership with crisis and the interaction of family ownership with institutional ownership and crisis is equal to zero. The null hypothesis of w_2 states that the sum of the coefficients of family ownership and its interaction with institutional advisors is equal to zero. z_1 and z_2 are Wald tests of the joint significance of the explanatory variables, and sector dummies, respectively. *** denotes coefficients that are significant at the 1 per cent level.

Table 6. Estimations using IV-2SLS Method

Dep. var.: Default Risk$_{i,t}$	H1	H2a	H2b	H2c
FamOwn	-0.0623	-0.0839**	-0.1104**	0.0010
	(0.0425)	(0.0424)	(0.0435)	(0.0230)
FamOwn*InstitOwn		0.0826***		0.0611*
		(0.0317)		(0.0325)
FamOwn*Bank Trust			0.1355***	
			(0.0341)	
FamOwn*Institutional Advisors			0.0582	
			(0.0710)	
FamOwn*Bank Trust * Institutional Advisors			0.1048	
			(0.1293)	
FamOwn*Crisis				-0.7478***
				(0.1906)
FamOwn*InstitOwn*Crisis				1.1428***
				(0.2615)
InstitOwn*Crisis				-0.1001***
				(0.0183)
InstitOwn	-0.0124***	-0.0198***		-0.0074
	(0.0036)	(0.0046)		(0.0053)
Bank Trust			-0.0237***	
			(0.0058)	
Institutional Advisors			-0.0164*	
			(0.0092)	
Bank Trust * Institutional Advisor			0.0105	
			(0.0105)	
Crisis				0.0825***
				(0.0163)
SIZE	0.0024*	0.0026**	0.0029**	0.0043***
	(0.0012)	(0.0012)	(0.0013)	(0.0012)
ROA	-0.1609***	-0.1574***	-0.1562***	-0.1593***
	(0.0203)	(0.0204)	(0.0208)	(0.0220)
LEV	0.0424***	0.0451***	0.0466***	0.0449***
	(0.0079)	(0.0080)	(0.0084)	(0.0087)
VOLAT	0.1969***	0.1962***	0.1981***	0.1916***
	(0.0083)	(0.0083)	(0.0085)	(0.0089)
CAPEX	0.0550	0.0269	-0.0004	-0.0212
	(0.0534)	(0.0545)	(0.0576)	(0.0604)
Const.	-0.0757***	-0.0706**	-0.0708**	-0.1169***
	(0.0302)	(0.0299)	(0.0310)	(0.0250)
Year fixed effect	Yes	Yes	Yes	No
Industry fixed effect	Yes	Yes	Yes	Yes
No. of observations	4,271	4,271	4,271	4,271
R-square	0.2239	0.2222	0.2054	0.0836

This table presents the two-stage least square estimation using two instrumental variables for family ownership: the average family ownership across all other firms in the same industry, and the natural logarithm of the firm's age. The dependent variable is the probability of default given by the Black-Scholes-Merton model. Columns H1, H2a, H2b and H2c show the results for Hypotheses H1, H2a, H2b and H2c, respectively. Sector and year dummies are included but not reported. ***, ** and *denote coefficients significant at the 1, 5 and 10 per cent level, respectively.

Table 7. Estimations with Different Dependent Variables

	H1	H2a	H2b	H2c
Panel A. Dependent variable: BSM with the default point as half of short-term debt plus long-term debt				
	H1	**H2a**	**H2b**	**H2c**
FamOwn	-0.0043***	-0.0137***	-0.0184***	0.0142***
FamOwn*InstitOwn		0.0279***		0.0113***
FamOwn*Bank Trust			0.0406***	
FamOwn*Institutional Advisors			0.0272***	
FamOwn*Bank Trust * Institutional Advisors			-0.0175***	
FamOwn*Crisis				-0.0547***
FamOwn*InstitOwn*Crisis				0.0846***
Panel B. Dependent variable: BSM with the default point as total debt				
	H1	**H2a**	**H2b**	**H2c**
FamOwn	-0.0090***	-0.0144***	-0.0133***	0.0166***
FamOwn*InstitOwn		0.0181***		0.0034**
FamOwn*Bank Trust			0.0387***	
FamOwn*Institutional Advisors			0.0188***	
FamOwn*Bank Trust * Institutional Advisors			-0.0111**	
FamOwn*Crisis				-0.0368***
FamOwn*InstitOwn*Crisis				0.0605***
Panel C. Dependent variable: Shortfall				
	H1	**H2a**	**H2b**	**H2c**
FamOwn	-0.1758***	-0.0672***	-0.1870***	-0.4039***
FamOwn*InstitOwn		0.3098***		0.6589***
FamOwn*Bank Trust			0.5005***	
FamOwn*Institutional Advisors			0.3384***	
FamOwn*Bank Trust * Institutional Advisors			-0.5322***	
FamOwn*Crisis				-1.5623***
FamOwn*InstitOwn*Crisis				1.5781**
Panel D. Dependent variable: Distance to default				
	H1	**H2a**	**H2b**	**H2c**
FamOwn	-0.0026***	-0.0011*	-0.0068***	-0.0123***
FamOwn*InstitOwn		0.0047***		0.0134***
FamOwn*Bank Trust			0.0163***	
FamOwn*Institutional Advisors			0.0046**	
FamOwn*Bank Trust * Institutional Advisors			0.0121***	
FamOwn*Crisis				-0.0276**
FamOwn*InstitOwn*Crisis				0.0320**

This table contains a summary with the coefficients and statistical significance of the variable of interest to test the hypotheses with different measures of default risk. Columns H1, H2a, H2b and H2c show the results for Hypotheses H1, H2a, H2b and H2c, respectively. The estimation method is explained in Table 3. In Panel A, the dependent variable is the probability of default given by the Black-Scholes-Merton model taking half of short-term debt plus long-term debt as the default point. In Panel B, the dependent variable is the probability of default given by the Black-Scholes-Merton model with total debt as the default point. In Panel C, the dependent variable is the shortfall in case of default, measured by the logarithm of the default point to market value of assets ratio. In Panel D, the dependent variable is the opposite of the distance to default given by the Black-Scholes-Merton model. Robust standard errors are in parentheses. ***, ** and * denote coefficients significant at the 1, 5 and 10 per cent level, respectively.

Table 8. Estimations with Different Subsamples

Panel A. Subsample of giant companies led by a strong leader				
	H1	**H2a**	**H2b**	**H**
FamOwn	-0.0312**	-0.0728***	-0.0026**	0.0001
FamOwn*InstitOwn		0.0808**		-0.0002
FamOwn*Bank Trust			0.0023	
FamOwn*Institutional Advisors			0.0030*	
FamOwn*Bank Trust * Institutional Advisors			-0.0015	
FamOwn*Crisis				-0.0049***
FamOwn*InstitOwn*Crisis				0.0060
Panel B. SubSample excluding giant companies led by a strong leader				
	H1	**H2a**	**H2b**	**H2c**
FamOwn	-0.0137***	-0.0214***	-0.0257***	0.0001
FamOwn*InstitOwn		0.0322***		0.0134***
FamOwn*Bank Trust			0.0452***	
FamOwn*Institutional Advisors			0.0200***	
FamOwn*Bank Trust * Institutional Advisors			-0.0068**	
FamOwn*Crisis				-0.0262***
FamOwn*InstitOwn*Crisis				0.0614***

This table summarises the main coefficients of the models using two different subsamples. The dependent variable is the probability of default given by the Black-Scholes-Merton model. Columns H1, H2a, H2b and H2c show the results for Hypotheses H1, H2a, H2b and H2c, respectively. Panel A shows the PLS coefficients for the subsample of giant companies led by a strong leader. The coefficients of H1 and H2 are multiplied by 10^3 and their standard errors by 10^2. Panel B shows the system GMM coefficients for the subsample excluding giant companies led by a strong leader. Robust standard errors are in parentheses. ***, ** and * denote coefficients significant at the 1, 5 and 10 per cent level, respectively.

Table 9. Non-linear Relationship between Family Ownership and Default risk

Dep. var.: Default Risk$_{i,t}$	1	2
Default Risk$_{i,t-1}$	0.1714***	0.1702***
	(0.0012)	(0.0012)
FamOwn	-0.0188***	
	(0.0016)	
FamOwn^2	0.0149***	
	(0.0020)	
Fam to 50		-0.0237***
		(0.0003)
Fam over 50		0.0134***
		(0.0005)
InstiOwn	-0.0079***	-0.0096***
	(0.0003)	(0.0001)
SIZE	0.0028***	0.0035***
	(0.0001)	(0.0000)
ROA	-0.1348***	-0.1450***
	(0.0014)	(0.0011)
LEV	0.0443***	0.0394***
	(0.0014)	(0.0009)
VOLAT	0.1754***	0.1795***
	(0.0013)	(0.0010)
CAPEX	0.2307***	0.2486***
	(0.0048)	(0.0035)
Const.	-0.1011***	-0.1096***
	(0.0022)	(0.0016)
z_1 (p-value)	(0.000)	(0.000)
z_2 (p-value)	(0.000)	(0.000)
z_3 (p-value)	(0.000)	(0.000)
m_1 (p-value)	(0.038)	(0.036)
m_2 (p-value)	(0.585)	(0.537)
Hansen (p-value)	(0.371)	(0.269)

The estimation method, specification tests and Wald test of joint significance are explained in Table 3. The dependent variable is the probability of default given by the Black-Scholes-Merton model. Fam0_to_50, which equals FamOwn if FamOwn is lower than 50.1%, and 50.1% otherwise; and Fam_over_50, which equals FamOwn– 50.1%, if family ownership is larger than 50.1% and 0 otherwise. Robust standard errors are in parenthesis. ***denotes coefficients significant at the 1 per cent level.