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Ownership concentration, contestability, family firms, and capital structure

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Abstract This study analyses the distribution of power among the several blockholders of a firm and the identity of those blockholders as a determinant of firm leverage. Using a sample of 694 firms from 12 Western European countries, our results support a negative relationship between ownership concentration in the hands of the main blockholder and firm leverage. Moreover, we detect that the presence of a second and third large shareholder (beyond the first blockholder) has a significant positive effect on the leverage ratio. In addition, the results show that contestability in family firms plays a more relevant role. Finally, we show that family firms do have significant impact on firm leverage level, and this impact varies depending on the legal framework and institutional environment. In our main sample the results show family firms negatively affect market leverage, supporting the theory that family firms are more averse to an increase in the debt level due to the risk of bankruptcy and financial distress as a result of having an under-diversified portfolio. In contrast, the opposite effect is found in the sample that excludes the United Kingdom. This last result cannot be explained by agency theory, given that family businesses are those that suffer less from Type I agency problems. This result suggests either some difficulty in financing their investments by issuing new

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equity or the need to use debt as a signal of the quality of its investments. Our results prove to be stable against a battery of robustness tests.

Keywords Ownership concentration · Agency costs · Leverage · Family · Contestability

1 Introduction

Although capital structure has been on the research agendas of financial economists for decades, "there is no universal theory of the debt-equity choice, and no reason to expect one" (Myers 2001: 81). Since Modigliani and Miller's (1958) irrelevance propositions, a number of theories have been developed to show that corporate capital structure does matter in the presence of capital market frictions and imperfections (e.g., corporate and personal taxes, costly financial distress/bankruptcy, agency problems and information asymmetry). The static trade-off theory focuses on two such frictions, namely taxes and financial distress costs, assuming the existence of an optimal capital structure equating the tax benefits of debt with the costs of distress of the firm (Myers 2001). The implication of the trade-off model is that firms have a target leverage level and adjust their leverage toward the target over time.

The pecking order theory (Myers 1984; Myers and Majluf 1984) hypothesizes that the primary determinant of firms' financing decisions is the problem of information asymmetry surrounding firm quality between firm insiders and outsiders. Under this theory, the firm will prefer retained earnings to debt and debt over equity. All of these theories have failed to yield conclusive evidence (Graham 2000; Leary and Roberts 2010). Lemmon et al. (2008) note that traditional leverage determinants explain a minor part of the variation in leverage (at most 30 %), while 60 % remains unexplained.

The agency theory posits that capital structure is determined by agency costs, i.e. costs due to conflicts of interest. The literature in this area has been built on the early work of Fama and Miller (1972) and Jensen and Meckling (1976). Grounded in agency theory, this paper seeks to examine how capital structure is affected by ownership concentration in the hands of the main shareholder, whether family firms differ in terms of the choice of funding sources and highlighting the role of multiple large shareholders in this stream of research.

A careful observation of the extensive research that relates debt decision to corporate governance suggests a clear relationship between capital structure and several variables such as, board size, board composition, management compensation, tenure of directors and managers, and managerial equity proportion (Friend and Lang 1988; Berger et al. 1997). Why then, is the information regarding the relationship between the existence of blockholders and the structure of capital so scarce? This is surprising because recent studies of corporate ownership structure demonstrate that dispersed ownership structure is far from a norm around the world. Stulz (2005) argues that large shareholders may pursue their own interests and their objectives are likely to have important repercussions on firms they invest in, thus influencing firm leverage decisions. Hanousek and Shamshur (2011) found that direct ownership concentration can explain about 9 % of the unexplained firm-level fixed effect.

Leverage and ownership concentration are interrelated through the agency problem, control, and risk. From a corporate governance perspective, ownership structure and debt can be seen as internal control mechanisms aimed at alleviating the agency conflicts that exist between different types of stakeholders inside corporations (D'Mello and Miranda 2010). The impact of blockholders on debt levels and Type I agency problems can be diverse: while, on the one hand, Friend and Lang (1988) show that the existence of blockholders is associated with higher debt ratios, suggesting that the presence of this group of investors might limit the discretion of management in seeking lower debt ratios, on the other hand, Moh'd et al. (1998) find evidence that institutional shareholdings are associated with lower debt ratios, suggesting that the presence of these investors might substitute for the disciplinary role of debt in capital structure. Our results support the evidence of Moh'd et al. (1998).

Following, we provide the first cross-country evidence of the effects of multiple large shareholders on capital structure. By doing so, we complement recent evidence by Jara-Bertin et al. (2008), Laeven and Levine (2008), Attig et al. (2009), Konijn et al. (2011), and Santos et al. (2012), who examine the effects of complex structure on corporate value. Our results suggesting that the contestability of the main blockholder determines an increase in debt, not only complements but, in our opinion, agrees with the work of Attig et al. (2008), presenting evidence that the existence of complex structure determines a reduction in the cost of debt. Moreover, the fact that the second and third blockholders see in debt an effective way to mitigate the possible expropriation behaviors of the main blockholder is undoubtedly a further explanation of our results.

Finally, we explore whether family companies differ in terms of debt. Family firms are common among listed firms worldwide (La Porta et al. 1999; Claessens et al. 2000; Masulis et al. 2011). There is a substantial convergence on results suggesting that family firms, ceteris paribus, tend to issue more debt. The preference of debt financing by family firms is supported by several authors, such as Ellul (2011), King and Santor (2008), and Croci et al. (2011). However, Ampenberger et al. (2011), using a sample of German companies, present evidence that family firms are less indebted than other companies. Our evidence supports one of Ampenberger et al.'s (2011:25) main conclusions: "we offer new evidence that the institutional environment is important in family firm research". Our results suggest that family firms from civil law countries have more debt than non-family firms, the opposite being true for the UK.

The rest of this paper is organized as follows. Section 2 presents the literature review and the formulated hypotheses, Sect. 3 describes the sample selection and the research methodology, and Sect. 4 presents the empirical results. The last section highlights the main conclusions of the paper.

2 Literature review and hypotheses

2.1 External blockholders and capital structure

It is acknowledged that a firm's corporate governance structure has a significant impact on its capital structure (Berkovitch and Israel 1996). It is argued that

effective corporate governance attributes, such as the presence of large shareholders among owners and an effective board of directors, signal a firm's governance quality to its prospective lenders. Consequently, firms with strong corporate governance are expected to have easier access to capital markets and, in general, are subject to lower expected agency costs of debt. This implies that these firms can afford greater leverage (Klock et al. 2005).

Shleifer and Vishny (1986) and Friend and Lang (1988) find that according to the active monitoring hypothesis, large shareholders have strong incentives to monitor and discipline management, resulting in lower direct agency conflicts between management and shareholders. However, a large stake shareholder may exploit minority shareholders (Burkart and Panunzi 2006). When there is no impediment to their so doing, large shareholders might be motivated and able to divert funds for their personal use, making gains from corporate resources at the expense of other shareholders. Large shareholders may also potentially act contrary to minority shareholders' interests, engaging in value-reducing activities whilst pursuing preferences that diverge from company value maximization (Fama and Jensen 1983).

The capital structure is a mechanism of corporate governance additional to the ownership structure (Hanousek and Shamshur 2011). In this study, we attempt to understand the effects of ownership concentration on capital structure in the context of large shareholders' behavior and agency theory. Rajan and Zingales (1995) contend that the effect of ownership concentration on capital structure is far from obvious. On one hand, the presence of large shareholders on the board of directors should reduce the extent of agency costs between managers and shareholders, and facilitate equity issuances. Furthermore, these shareholders would be undiversified, increasing their aversion to debt.

On the other hand, if some of the shareholders are banks, there is a number of reasons that make a higher debt expected: (1) in these circumstances it is easier for the firm to obtain a loan from the bank; (2) additionally, the banks can use their lending activity as an additional instrument to discipline management; (3) finally, once the recovery of credit is assured, these shareholders can harness their power as shareholders to increase turnover from the company. Although relatively unexplored, recent evidence of Barucci and Mattesini (2008) for Italian Firms seem to confirm this possibility.

One other major issue to determine the direction in which the existence of large blockholders influences the level of indebtedness is how its existence affects the cost of debt. According to Dyck and Zingales (2004) the potential for private benefits extraction by the controlling shareholders increases the cost of finance. However, Zeckhauser and Pound (1990) suggested that firms with large shareholders may ensure that management does not shift the firm's investment policies away from those projects preferred by (and expected by) debtholders and thereby should have lower costs of debt. Lin et al. (2011:11), for a sample for 22 Western European and East Asian countries for the period from 1996 to 1999, stress that "for a given firm, the change in the cash-flow rights of a borrower's largest owner is negatively related to the change in the firm's loan spreads, everything else equal!"

Shleifer and Vishny's (1986) active monitoring hypothesis, however, has been challenged by Pound (1988) who argues that large shareholders may be passive

voters who collude with corporate insiders against the best interests of dispersed shareholders. If this hypothesis more accurately describes the organizational role of large blockholders, corporate leverage may be negatively related to the share ownership of such blockholders.

Additionally, Jensen and Meckling (1976) stress that a firm's blockholders may prefer less debt if debt brings more monitoring (Leland and Pyle 1977). Doukas and Pantzalis (2003) defined agency cost of debt as conflict between shareholders and bondholders. Zeckhauser and Pound (1990) argue that the presence of large shareholders may act as a signal to the market, showing that managers are less able to indulge in profit reducing behavior, thus, it may mitigate the need for managers to use debt as a signal. Hence, the presence of large shareholders should be associated with lower debt ratios.

In information-asymmetry models, blockholders play an important role if managers possess information that is not known by outside investors. In general, both debt and blockholders can alleviate this issue by acting as substitutes and narrowing the information gap between inside and outside shareholders. Blockholders mitigate the adverse selection costs of equity by reducing information asymmetry through information-gathering activities and trading patterns. As equity financing becomes comparatively cheaper, firms with a high ownership concentration should have less debt than those with low institutional holdings.

Despite the theoretical link, few empirical works have examined the relationship between blockholders' ownership and leverage. In addition, empirical studies have been unable to reach consensus about the actual relation between blockholders and firm leverage.

Ellul (2011), for a sample of 5,975 firms from 38 countries over the period 1992–2006, and King and Santor (2008), for a sample of Canadian companies, reveal a positive relationship between the concentration of ownership in the hands of the largest blockholder and debt. Brailsford et al. (2002) and Margaritis and Psillaki (2010) also find that more concentrated ownership is generally associated with more debt in the capital structure.

Short et al. (2002) reveal a negative relationship between blockholders' ownership and financial leverage. Croci et al. (2011) and Schmid (2013) also find a negative relationship between the control rights of the ultimate owner and debt. Recently, Michaely and Vincent (2012) find a negative relationship, in US companies, between holdings of institutional investors and indebtedness. Finally, Agrawal and Nasser (2011) conclude that the existence of an independent Director, who is a blockholder, is not related to the level of financial leverage.

Although there is no convergence (theoretical and empirical) on the blockholder effect of capital structure, our conviction is that debt and the existence of large blockholders are internal governance mechanisms that are clearly substitutes in that both have the ability to condition managers' behavior. From this point of view, the capital structure and the ownership structure are substitutive mechanisms of corporate governance, and one should expect a negative relation between them. Moreover, large shareholders are exposed to the firm's specific risk far more than other shareholders. Additionally, debt imposes limits on the behavior of blockholders, and its amount is publicly known by the minority shareholders. This

external limitation will interfere in the process of the appropriation of private earnings. Finally, Jensen and Meckling (1976) stress that a firm's blockholders may prefer less debt if debt brings more monitoring. This set of arguments are tuned with the context of Western European countries, therefore we can anticipate a negative relationship between the existence and extent of the voting rights of the main blockholder and the use of debt. Thus, we formulate the first hypothesis:

H_1 All else equal, higher levels of ownership concentration in the hands of the largest blockholder lead to lower debt levels.

2.2 The importance of contestability on leverage

Sharing of control is a question recently addressed by several theoretical and empirical papers. Relevant studies focus only on the effect of the largest controlling shareholder, not dealing with the incidence of control dilution among two or more blockholders and leverage in controlling minority structures. Therefore, we examine the contestability effect of the largest shareholder's power on leverage.

In this context, several studies report that other blockholders reduce the potential for wealth diversion, either by monitoring (Pagano and Roëll 1998), or by forming a coalition with higher equity stakes, internalizing diversion costs (Maury and Pajuste 2005). Bloch and Hege (2001) demonstrate, in two large shareholder settings, that the higher the control contestability, the lower the private benefits that may be reaped.

Gomes and Novaes (2006) show that when unanimity among controlling shareholders is required to pass decisions, the misuse of the firm's resources is unlikely to occur. Similar conclusions are reached by Bennedsen and Wolfenzon (2000). On the other hand, Zwiebel (1995) argued that when control benefits may be apportioned between moderate-sized blockholders, depending on the relative size of the shareholder's interest, those blockholders may collude to maximize their private benefits from partial control. Therefore, other controlling shareholders may be prone to free ride (Winton 1993) or may become passive voters, preferring collusion with insiders to monitoring (Pound 1988). Academic literature also generally agrees that ownership concentration has a negative impact on price informativeness, reflecting higher levels of private information in firms with concentrated ownership. For instance, Edmans and Manso (2011) argue that the competitive trading behavior of multiple small blockholders improves price informativeness. Maury and Pajuste (2005), Laeven and Levine (2008), Jara-Bertin et al. (2008), Attig et al. (2009) and Santos et al. (2012) find that the contestability of the first largest shareholder positively affects firm value.

From the perspective of blockholders with undiversified portfolios, leverage is an expensive way to maintain autonomy and to determine the firm's policy since higher indebtedness increases bankruptcy risk and financial distress (Mishra and McConaughy 1999). Consequently, if the largest shareholder has already enough voting power it should not be expected that leverage would be used. However, if there are other blockholders the main blockholder may use leverage over the issuing of new capital in the financing of new investments, since this would prevent the increase of the relative position of other blockholders and thus the power to challenge their interests.

If we focus on the second and third largest shareholders, we expect a direct relationship between their ability to challenge the first largest blockholder and the level of indebtedness (Ellul 2011). Three of the main reasons that supports this expectation are: first, the fact that the second and third largest shareholders own fewer shares than the main owner and thus have a risk tolerance between that of the first largest blockholder and the liquidity shareholders; second, these blockholders see in debt a way to avoid expropriation behaviors of the largest shareholder arising from the accumulation of free cash flow (Jensen 1986); and third, as stressed by Attig et al. (2008) and Aslan and Kumar (2012), the presence of a second blockholder is associated with lower loan prices, changing the relative price of funding sources and underpinning the use of debt.

Finally, if we consider the possibility that the two or three of the largest blockholders collude to expropriate minority shareholders, in these circumstances an increase in debt is also expected as this ensures the maintenance of the coalition's ability to enforce their interests. Considering these arguments, we formulate the second hypothesis:

H_2 The more power that exists in the hands of the second and third largest blockholders, the higher levels of debt.

2.3 The impact of the family blockholders on leverage

Family firms are of particular interest due to the unique traits and peculiarities associated with family business models. However, empirical results are far from consensual. Silva and Majluf (2008) suggest that family firms may allocate resources efficiently through the internal capital market, endorsing the positive view of family firms. Claessens et al. (2000) emphasize the conflicts in family firms, indicating that family ownership and control are negative influences. Miller et al. (2007) do not find evidence that family firms outperform their counterparts.

The agency theory predicts that in family firms, the shareholder-manager agency conflict is expected to be minimal. Family blockholders acquire the necessary information, have firm-specific knowledge and incentives to monitor management effectively. In family firms, concentrated ownership and owner-management would lead to low or inexistent agency costs between owners and managers (Jensen and Meckling 1976; Fama and Jensen 1983). Family firms tend to be less indebted for several reasons. First, founding families are usually large and undiversified investors. The combination of undiversified family holdings, and the desire to pass the firm into subsequent generations suggest that family shareholders are more likely to have stronger incentives to reduce firm risk while wanting to maintain control. Lower levels of debt can reduce firm risk because it reduces the probability of bankruptcy (Jensen 1986). Additionally, the primacy of creditor rights increases the risk of losing control of the firm. Thus, an observation that family firms carry less debt than non-family firms can be consistent with families' high risk aversion.

Secondly, family firms are long-term investors. Smith and Warner (1979) state that high levels of debt financing are detrimental to long-term performance because, under these conditions, too much emphasis is placed on meeting short-term goals,

and preventing default risk rather than maximizing long-term firm value. Stein (1989) demonstrates that shareholders with long investment horizons help reduce myopic decision-making by management. If families do not want to be forced to liquidate their firm, then one would expect to see lower leverage for family firms (Anderson and Reeb 2003b).

Thirdly, if controlling families pursue their own personal objectives at the expense of other shareholders, and from a corporate governance perspective, debt can be understood as a monitoring device for managers and blockholders. Thus, we anticipate that family firms use less debt because of the monitoring role and potential constraints imposed by creditors (King and Santor 2008).

Another reason for a lower level of leverage is related to family performance. Some authors find evidence of performance superiority for family businesses. Examples are Anderson and Reeb (2003a) and Villalonga and Amit (2006) for the US, Andres (2008) for Germany and Santos et al. (2012) for Western Europe. Hence, greater aversion to debt on the part of family companies may be a confirmation of pecking order theory.

Finally, the combination of recent evidence concluding that family firms distribute higher levels of results than other companies (Faccio et al. 2001; Setia-Atmaja et al. 2009; Pindado et al. 2012) with a set of studies suggesting a negative relationship between dividends and leverage (Croci et al. 2011; Ampenberger et al. 2011; Pindado et al. 2012; Ellul 2011) constitute another reason that makes us anticipate a lower indebtedness of family businesses[1,2]. Moreover, if dividends are considered to be a signal for future earnings, family firms with high dividend payout ratios face lower cost of equity than non-family firms, reinforcing the expectation of family firms resorting to less debt in financing their investments. In addition to this last argument, Rozeff (1982) elaborated that an increase in dividend can raise the amount of transaction costs of external financing and thus change the relative price of different funding sources to the detriment of the use of debt capital.

However, there are also arguments supporting the position that the peculiarities of these companies lead to higher debt levels. The use of debt financing instead of new equity concentrates the voting power, and avoids the dilution effect (Ellul 2011; King and Santor 2008). In addition, it can reduce the risk of a hostile takeover (King and Santor 2008). If family investors want to signal that expropriation is not their goal, family firms are more likely to carry more debt levels. An increase in debt implies that they are subject to the scrutiny of creditors, which help alleviate agency conflicts. The monitoring benefit will be greater in firms with more concentrated ownership. Thus, we would expect to see higher leverage for family firms than non-family firms. Because of their long term commitments to the firm, family owned firms have stronger incentives to mitigate agency conflicts with debt claimants and as a result they may face lower costs of debt financing (Anderson et al. 2003). Thus family firms may carry more debt in their capital structure.

[1] This relationship between dividends and leverage appears to be robust to different contexts (Michaely and Vincent 2012).

[2] A negative relation between debt and dividends indicates that both are used as substitute monitoring mechanisms (Setia-Atmaja et al. 2009).

According to Ali et al. (2007), lower capital cost for family firms may result from the reduction of information asymmetries by family firms. Moreover, debt financing is easier for family businesses as debtholders see lower risk in them, and so family businesses tend to use more debt (Margaritis and Psillaki 2010).

The research on the impact of family control on leverage has provided mixed results. Mishra and McConaughy (1999) found that family firms in the US employed lower levels of leverage. They argue that founding families are concerned with two negative effects of debt: increasing costs of financial distress and the risk of losing control over their firms. Using a panel data set of 660 industrial companies in Germany, Ampenberger et al. (2011) show that the leverage level is significantly lower in family firms, regardless of the definition of leverage applied, which is in line with Mishra and McConaughy's (1999) conclusion. Schmidt's (2013) results are in line with Ampenberger et al.'s (2011). Margaritis and Psillaki (2010) also find evidence that French family firms use less debt than their non-family counterparts.

Anderson and Reeb (2003b) find no evidence of a systematic difference between family and non-family firms in terms of capital structure. Setia-Atmaja et al. (2009) report that Australian family firms show significantly higher debt ratios than non-family firms. Ellul (2011) reports that family firms tend to have higher leverage than non-family firms. This differential increases in countries with weak legal protection of minority shareholders. He speculates that control considerations may affect this result, as family blockholders are concerned with the loss of control associated with external equity finance. From his perspective, debt offers a solution to receive external financing without diluting control power over the firm's equity stake. Recently, Croci et al. (2011), in the European context, highlights the singularity of family firms in terms of debt and confirmed Ellul's (2011) results for Western Europe. They show not only that family-controlled firms raise more debt than non-family-controlled firms, but also that there is an inverse relationship between blockholder shareholding size and leverage.

Based on the inconclusive findings, we believe that a more detailed analysis on family firm is necessary in order to shed more light on this important issue. We expect family companies to be associated with low levels of debt, for a number of reasons: (1) family firms, as widely evidenced, have better performance than non-family firms and thus our expectation may be the confirmation of pecking order theory; (2) family blockholders are long term investors and, as Smith and Warner (1979) state, high levels of debt financing are detrimental to long-term performance. Additionally, this feature of family businesses reduces their incentives to expropriate the debt providers (Schmid 2013); (3) families as shareholders are usually large and undiversified investors and consequently have a greater aversion to risk than other types of blockholders and, a fortiori, than diversified investors; (4) any private benefit of family shareholders such as high social reputation might be lost in the event of the firm's financial distress. If family owners seek to enjoy the private benefits of control, they will try to avoid using too much debt because of the monitoring role and potential constraints imposed by creditors (King and Santor 2008). Additionally, as Anderson et al. (2003) point out, family monitoring and control may mitigate the owner-manager agency conflicts and hence the need to use debt as a disciplinary device. Hence, we expect lower leverage ratios in family

firms. Finally, as evidenced (Faccio et al. 2001; Setia-Atmaja et al. 2009; Pindado et al. 2012), leverage in family firms plays a small role in solving the problems of free cash flow.

H_3 Family firms present lower levels of debt than their counterparts.

3 Data, methodology and control variables

3.1 Data

To examine the relationship between ownership structure and leverage, we use data on 694 non-financial listed firms across 12 countries in Western Europe (Belgium, Finland, France, Germany, Greece, Italy, Netherlands, Portugal, Spain, Sweden, Switzerland, and the United Kingdom). We thus ensure that different legal systems are represented in our sample. This fact helps us to generalize our research results. The firm-level data was obtained from the AMADEUS[3] database constructed by Bureau Van Dijk. In order to account for differences in ownership and corporate governance structure due to regulation, we excluded financial firms and utilities. For each country, we constructed a panel of non-financial companies based on available financial and ownership information for five consecutive years, between 2002 and 2006. The time period of our study is restricted by the type and quality of information needed to test the formulated hypotheses. Generally, we find that ownership data in AMADEUS before 2002 is of poor quality. On the other hand, our GMM method imposed at least five consecutive years per company. Therefore, our final sample is a balanced panel comprising of 694 companies (3,470 observations) for which information is available in all years between 2002 and 2006. We use total shareholding (percentage of total voting rights[4] held by the shareholder where the path by which ownership is held may be direct or indirect[5]). For each sample firm-year, we search for the largest single owner of voting rights. If this shareholder owns at least 10 % of the firm's voting rights, we identify it as blockholder (for that firm-year). We consider a firm to be widely held (in a given year) if it does not have any shareholder with control rights at or above this threshold level (Aslan and Kumar 2012).

[3] Specifically, "TOP 1.5 million module" of AMADEUS, which comprises the largest 1.5 million corporations that operate in the Eastern and Western European regions. The merits of this database as well as its complementary OSIRIS are measured by their increasing use in research of corporate governance (Lins et al. 2012, Franks et al., 2012, among others).

[4] The Ownership Database (AMADEUS) intends to track control relationships rather than patrimonial relationships. This is why, when there are two categories of shares split into Voting/Non-voting shares, the percentages that are recorded are those attached to the category of voting shares.

[5] The AMADEUS and OSIRIS data report the percentage of direct and/or indirect ownership of each shareholder. A direct link indicates that company 'A' owns a certain percentage of company 'B', while an indirect link means that company 'A' owns company 'B' through company 'C'. AMADEUS traces control by first calculating voting rights but not cash-flow rights. A shareholder is defined as 'large' if direct and indirect voting rights sum to 10 % or more (Maury and Pajuste 2005; Laeven and Levine 2008; Jara-Bertin et al. 2008; Attig et al. 2009).

The AMADEUS database (from 2002 to 2006) did not have information on ultimate owners for all firms. However, this was not the case for 753 (24.41 %) observations (when focusing on companies that are not widely held, 3,085 observations) where we know the ultimate owner (i.e., assuming one of the following types: family and state). Additionally, combining information about the identity of the shareholders with an independence indicator provided by the database, we can say that 40.65 % (1,254 observations) of the firms are actually independent of their blockholders. To be independent, the shareholders of the firm must be considered as unable to exert controlling power over a company (i.e., assuming one of the following types: public; unnamed private shareholders, aggregated; other unnamed shareholders, aggregated) or must be a firm with an independence indicator of A+, A, or A− (i.e., an entity with no shareholder with more than 25 % of voting rights). Finally, for 1,078 observations we do not know if we were dealing with the ultimate owners.[6]

The fact that we do not possess cash flow rights is another limitation of our investigation, as it does not allow us to explore the variable Wedge (control rights—cash flow rights). The *Wedge* variable is intended to gauge the entrenchment effect of excess control rights. The Wedge coefficient estimate (Croci et al. 2011; Ellul 2011) is always negative and statistically significant, confirming that blockholders that keep control through control enhancing mechanisms use lower leverage. We would however stress that the methodology adopted, GMM estimation, which includes the lagged dependent variable and the addition of fixed time and company effects, filters out an unusually high amount of company-specific heterogeneity (Wedge and other aspects of ownership structure, which remain constant over the period) that may influence both voting rights and leverage, which is a key advantage of the present study. Michaely and Vincent (2012) using the same methodology do not use the variable Wedge when investigating the relationship between institutional holdings and capital structure in US public firms.

We exclude firms that have missing data for all control variables needed for our baseline empirical specification. For this reason we excluded Denmark from the sample. We also dropped firms with negative values for several variables: total assets; non-current liabilities; current liabilities; intangible fixed assets and shareholders' funds. We further dropped firms whose ownership information was unlikely (we excluded, for example, companies whose total voting rights of the three major shareholders were greater than 100 %).

After removing firms with missing values pertaining to financial information, the AMADEUS database provides fairly consistent information regarding ownership variables. Still, when confronted with missing values for ownership variables (mostly the voting rights of the third shareholder) we tried first to solve simple cases, such as: (1) when the previous and following value adjacent to the missing value pertained to the same shareholder with the same voting rights, we replaced the missing value by this amount; (2) if for instance the shareholder was the same but

[6] After analyzing the univariate statistics of the voting rights for the latter group of observations we can affirm that there is a very large probability that they are not the ultimate owners (mean = 49.23, median = 47.10; first quartile = 34.10 and the fourth quartile = 62.50 %). Data not reported in any table.

the values were different, we substituted the missing value for the value immediately preceding it (as highlighted in previous studies, the ownership structure of corporations tends to be relatively stable over time); (3) when missing values belonged to the year 2006 or 2002 and we had information that it was the same shareholder, we replaced respectively by the previous or by the following value. In a second step, we double-crossed information we could obtain through Google, which allowed us to solve another set of cases, leaving just 205 missing values unresolved relating exclusively to the third shareholder (5.9 % of observations, i.e. 41 companies). Finally, we created a dummy equal to one when the data is missing to control for the possibility that such firms are discretely different from others and to avoid a significant reduction in sample size (Jiao 2010). This dummy is not reported in the tables and is always statistically insignificant, i.e. the results do not change with the introduction of this dummy variable.

In line with previous capital structure studies, and in order to avoid outliers affecting the results, we winsorized all financial variables at 0.01 and 0.99.

3.2 Methodology

In order to test the relationship between ownership concentration and the firms' leverage, we consider the following model:

$$\begin{aligned} \text{LEVERAGE}_{it} = {} & \alpha_0 + \beta_1 \text{LEVERAGE}_{i,t1} + \beta_2 \text{LSBLOCK1}_{it} + \beta_3 \text{COALITION10}_{it} \\ & + \beta_4 \text{MKTB}_{it} + \beta_5 \text{AGE}_{it} + \beta_6 \text{SIZE}_{it} + \beta_7 \text{ROA}_{it} + \beta_8 \text{TANG}_{it} \\ & + \beta_9 \text{TAX}_{it} + \beta_{10} \text{NDTS}_{it} + \zeta_t + \lambda_i + \theta_p + \varepsilon_{it} \end{aligned} \quad (1)$$

There is no universally used measure for the leverage variable. Some studies rely only on market leverage (de Jong et al. 2008); others rely only on book leverage (Mackay and Phillips 2005) and others still on both (Booth et al. 2001; Lemmon et al. 2008). Furthermore, DeAngelo and Roll (2011) find that book and market leverage measures are highly correlated. The arguments for the use of market or book leverage are numerous. Moreover, there is some controversy regarding which measure is more appropriate. To address this issue, and for robustness reasons, we elect market leverage as the main dependent variable (Elsas and Florysiak 2011), however, we also consider book leverage as a dependent variable (regressions not presented). Market leverage is computed as: (long term debt + debt in current liabilities)/(long term debt + debt in current liabilities + market equity), and book leverage is obtained by replacing market equity with book equity.

Market leverage may provide a more realistic measure of leverage, since market value is closer to the intrinsic firm value. In addition, we argue that market leverage may reflect a more precise perspective of the potential for future leverage. In other words, if book leverage reflects the debt in use to finance assets in place, market leverage may be a reflection of the level of the firm's financial slack.

Our central objective is to investigate whether the presence of large blockholders and the distribution of their voting rights affect the capital structure of companies. First, to test our first hypothesis on the blockholder effect, we created a variable of ownership concentration, LSBLOCK1_{it} (the percentage of voting rights held by the

largest shareholders of the company. The cutoff point is 10 % of voting rights). As discussed in Sect. 2.1 we expect a negative correlation between the concentration of ownership in the hands of the main blockholder and the dependent variable. Additionally, and in order to test the linearity of the blockholder effect, we created the following variables: $OWNER1_{it} = OWN1 * LSBLOCK1_{it}$, $OWNER2_{it} = OWN2 * LSBLOCK1_{it}$ and $OWNER3_{it} = OWN3 * LSBLOCK1_{it}$, where OWN1, OWN2 and OWN3 are dummy variables denoting low, intermediate and high ownership concentration, respectively. Although we defend that companies led by blockholders have a greater aversion to debt than other companies, which is consistent with the arguments of our Hypothesis 1, we recognize that reasons of control may overlap at certain levels concentration of ownership and may result in a reduction of this aversion to debt. Moreover, debt for high levels of ownership concentration in the hands of the main blockholder can also be used to limit excessive exposure to business risk. For these reasons we assume that the relationship cannot be precisely linear.

Finally with the objective of testing the robustness of the blockholder effect we also test another cutoff point. Thus, $LSBLOCK125_{it}$ is the percentage of voting rights held by the largest shareholder of the company with a cutoff point of 25 % of voting rights. Our expectation is that our results are robust to this change in the cutoff point.

To test our second hypothesis we built the variable $COALITION10_{it}$ $[(LSBLOCK2_{it} + LSBLOCK3_{it})/(LSBLOCK1_{it} + LSBLOCK2_{it} + LSBLOCK3_{it})]$ that represents a ratio which is positively associated with the contestability of the first largest blockholder by other blockholders. The larger the value, the more balanced the distribution of voting rights between the three largest shareholders. Under the efficient-monitoring assumption we predict a positive relationship between this variable and leverage.

As in the blockholder effect we also decided to test the robustness of our results here with another cutoff point. The variable $COALITION25_{it}$ is constructed algebraically with the same formula of $COALITION10_{it}$. The cutoff point is 25 % of voting rights. Here again our conviction is that the change of cutoff point does not moderate the results.

To test if the identity of the main blockholder moderates the blockholder effect we tested the variable FD_{it}, which is a dummy variable that equals one if the largest shareholder is an individual or a family with at least 10 % of the voting rights and zero otherwise (Mishra 2011; Pindado et al. 2012). If family businesses present lower levels of debt than their counterparts, consistent with Hypothesis 3, we should find a negative coefficient for this variable.

Finally, we also tested if the contestability effect is different for family firms. In this case, we interact the variable FD_{it} with $COALITION10_{it}$. As family businesses have a particular aversion to debt and therefore a greater potential divergence of interests with other blockholders, our expectation is that contestability exercised by the remaining blockholders is particularly relevant in family businesses.

3.3 Control variables

To define the control variables, we follow the studies of Croci et al. (2011), Ellul (2011), Ampenberger et al. (2011) and Schmid (2013).

3.3.1 Market to book ratio

The expected relation between leverage and growth opportunities is not clear. If there are arguments that suggest a negative relation, namely the theory of agency, the pecking order theory predicts a positive relationship. Firms with high growth opportunities will retain financial flexibility through a low leverage in order to be able to exercise those opportunities in subsequent years (Myers 1977). Several explanations are provided: firstly, a firm with good opportunities for growth would be unlikely to issue debt to finance projects, due to the high financial distress costs this implies, and the fact that intangible assets would be valueless in the case of bankruptcy (Harris and Raviv 1990). Second, firms with a higher market-to-book ratio are likely to show lower agency costs of free cash flow (Jensen 1986). Third, the asset substitution problem is particularly more relevant in firms with greater growth opportunities. This will in turn lead lenders to impose higher costs of financing, which means that firms whose opportunities for growth are high will have less debt.

Nevertheless, growth opportunities can also correlate positively with leverage, according to the pecking order theory. According to Myers (1984), the preferred means of reducing the costs of asymmetric information is by funding resources. In this sense, companies would prefer using retained earnings in first place, then low-risk debt, high-risk debt and, as the last resource, new equity. It follows, then, that when a company is presented with good investment opportunities, but lacks internal cash flow, debt is a first option for funding projects, and high leverage is the result in such companies. Finally, as companies with higher growth opportunities present greater information asymmetries, they find that high-debts are a form of signaling the quality of their investments.

As suggested by Myers (1977), we use the market value of equity to the book value of equity as a *proxy* for growth opportunities. $MKTB_{it} = MVE_{it}/BVE_{it}$, where MVE_{it} is the market value of equity and BVE_{it} is the book value of equity.

3.3.2 Profitability

The relation between the capital structure and the ROA is theoretically and empirically controversial (Harris and Raviv 1991; Rajan and Zingales 1995; Booth et al. 2001). Modigliani and Miller (1963) pointed out that a company may opt for debt in order to take advantage of tax shields. Moreover, there is a positive association between profitability and the existence of free cash flow problems and in these circumstances debt may ensuring that managers do not pursue individual objectives (Jensen 1986).

According the pecking order theory, a more profitable firm is more likely to substitute debt for internal funds. Therefore, by holding the investment level fixed, a negative relationship between debt levels and ROA is expected. However, when there is asymmetric information about the quality of a firm, the more profitable companies may use a higher debt issue to signal their quality to the market. On the other hand, profitable firms prefer not to raise external equity in order to avoid potential dilution of ownership.

The trade-off hypothesis, in turn, states a positive relationship because more profitable firms have a lower probability of bankruptcy (Fama and French 2002). Besides, more-profitable firms prefer debt in order to benefit from the tax shield (Frank and Goyal 2003). In addition, Rajan and Zingales (1995) argue that creditors prefer to give loans to firms with high current cash flow.

Following Titman and Wessels (1988), our empirical model included ROA_{it} defined as $EBITDA_{it}/TA_{it}$, where $EBITDA_{it}$ denotes earnings before interest, taxes, depreciation and amortization and TA_{it} is the book value of total assets.

3.3.3 Size

In previous studies, the size of a firm was found to be an important determinant of leverage (Harris and Raviv 1991; Rajan and Zingales 1995). Larger companies are more likely to use debt than smaller ones, according to the tradeoff theory. This is due to the fact that the larger the firm, the lower the financial distress costs and risk of bankruptcy, and that debt is a less costly option for larger companies. Larger firms may be more diversified, thereby making them less prone to bankruptcy risk (Titman and Wessels 1988) and more transparent for outside investors (Rajan and Zingales 1995), thus benefiting from lower credit spreads. Diamond (1989) also argues that large established firms have better reputations in the debt markets and, hence, can assume more debt.

Rajan and Zingales (1995) suggest that this relationship could also be negative. They state that larger companies are, in general, more transparent than smaller firms, favoring equity financing because the cost of equity financing due to asymmetric information is smaller for them. In this article, we use the logarithm of revenues as a proxy for size ($SIZE_{it}$ = Ln (Fixed $Assets_{it}$)) (Rajan and Zingales 1995).

3.3.4 Asset tangibility

The tangibility of the firm's assets is closely associated with agency costs of debt and the costs of financial distress (Myers 1977; Booth et al. 2001). Titman and Wessels (1988) state that asset tangibility has a positive effect on leverage because these assets can be used as collateral. In the same line of argument, Jensen and Meckling (1976) state that the agency costs of debt due to the possibility of moral hazard on the part of borrowers increases when firms cannot collateralize their debt. In other words, firms unable to provide collaterals may have more opportunities to expropriate bondholder interest by substituting safer projects for riskier projects (Booth et al. 2001). In addition, tangible assets are more valuable on the market than intangible assets in the case of bankruptcy, and so bondholders will demand lower risk premiums. Tangible assets can also mitigate concerns over insider resource expropriation. Moreover, the use of collateral plays a more important role in countries where creditor protection is relatively weak (La Porta et al. 1998). Thus, a positive relationship between tangibility of assets and leverage is anticipated.

Nonetheless, great care must be taken in analyzing the association between tangibility and leverage. First, Chittenden et al. (1996) showed that long-term debt and tangibility are more closely connected. Second, DeAngelo and Masulis' (1980) theory of tax shield substitutes where accounting appreciation is concerned does not support a relationship between tangibility and leverage. Even so, many researchers show a positive relationship between leverage and tangibility (Rajan and Zingales 1995). We use the ratio of fixed assets to total assets as proxy for tangibility ($TANG_{it} = FA_{it}/TA_{it}$ where FA_{it} is the book value of the fixed assets and TA_{it} is Total Assets).

3.3.5 Taxes

The trade-off theory suggests that firms will continue to increase debt until bankruptcy and agency costs from debt are merely covered by the tax benefits. DeAngelo and Masulis (1980) demonstrate that non-debt tax deduction can be used to describe the tax shield benefits of debt. We use the effective tax rate (TAX), which is calculated as the ratio of paid taxes to earnings before taxes. The expected sign for this variable depends on the capital structure theory we consider. On one hand, a positive sign is consistent with the trade-off theory context (DeAngelo and Masulis 1980); on the other hand, a negative sign could be a proxy for firm's profitability and, consistent with the pecking-order theory, a lower debt level will be expected (Myers 1977).

3.3.6 Non-debt tax shields

DeAngelo and Masulis (1980) state that firms will use less debt in their capital structure if they have means of reducing taxes other than deducting interest. Non-debt tax shields (NDTS) may be regarded as substitutes for tax benefits of debt financing; as a consequence, the tax advantage of leverage will decrease when other tax deductions (such as depreciation) increase. Consistent with this argument, debt level should be inversely related to the level of the NDTS, measured as depreciation divided by total assets (Titman and Wessels 1988). It is important to remember, however, that this may act as a proxy for other variables. For example, there is a tendency for firms with higher depreciation ratios to have both fewer growth options in their investment opportunity sets and also to have relatively more tangible assets (Barclay and Smith 1995). According to the above-mentioned theory for growth opportunities, a positive relation between the depreciation ratio and the leverage ratio is to be expected.

3.3.7 Age

We further consider the age of the firm. Companies that have existed only a short time might not have a long enough record of accomplishment to demonstrate their creditworthiness to lenders. Before granting a loan, banks tend to evaluate the creditworthiness of entrepreneurs. According to Diamond (1989), firm reputation may also be used, thus avoiding problems associated with the evaluation of

creditworthiness. The older the firm, the easier and cheaper it is to acquire debt, as they have close links with their lenders. This leads to a positive relationship between the age and leverage of the firm. Berger and Udell's (1998) financial growth cycle theory suggests that older firms in a mature stage have stable cash flows and raise debt with more ease. As far as agency costs are concerned, older organizations tend to have less debt, as their decision makers either prefer to avoid risk being more fixed in their ways, or they may be more concerned with their reputation and career. Petersen and Rajan (1994) found that older firms should have higher debt ratios since they should be higher quality firms. Esperança et al. (2003), however, found that age is negatively related to both long-term and short-term debt. We measure AGE_{it} as $Ln(YEARS_{it})$, where $YEARS_{it}$ is the number of years since the firm began its activity (Villalonga and Amit 2006).

3.3.8 Sector

Highly capital intensive firms such as in the construction, manufacturing and transportation industries may be more likely to be candidates for bank loans. On the contrary, service firms, are less likely to use external capital because they often lack tangible assets that can be used as collateral. According to Bradley et al. (1984) industry classification accounted for 25 % of the variation in firm leverage.

Table 1 presents a detailed description of all the independent and control variables.

When we explore the impact of the identity of the largest owner, we categorize the firm according to several investor groups: (1) *family*, following previous literature (Faccio and Lang 2002; Maury 2006; Mishra 2011; Pindado et al. 2012) and taking into account the data availability related to companies' ownership structure, we consider a firm as being family-controlled if the ultimate owner at the 10 % threshold is an individual, a family or an unlisted company; (2) *institutional investor*, when the principal blockholder is either a financial company, an insurance company, a mutual pension fund/trust, a private equity company or a bank; (3) *corporate investor*, when the principal blockholder is a non-financial company and (4) *other*. When there are several shareholders with more than 10 % of voting rights, the classification is based on the category of the largest blockholder.

The regression includes several dummies. We include industry dummies (δ_s) since both governance and performance may reflect industry factors, such as different business cycle positions, different regulatory frameworks and different growth opportunities. The time effect ζ_t controls for common macroeconomic shocks; λ_i controls for unobserved time-constant individual heterogeneity of firms (since companies are heterogeneous, there are always characteristics influencing the company value that are difficult to measure or hard to obtain). θ_p is a country dummy variable standing for the country-specific effect.[7] ε_{it} is a white-noise error.

[7] Because country analysis would produce biased results where there are significant differences in the number of observations by country, and following Gungoraydinoglu and Öztekin (2011) and Alves and Ferreira (2011), we decide to focus on groups of countries with the same legal system (Common-law origin; German origin; Scandinavian origin; French origin).

Table 1 Variables definitions

Variable	Description
Dependent variables	
Market leverage	(long term debt + debt in current liabilities)/(long term debt + debt in current liabilities + market equity)
Independent and dummy variables	
$LSBLOCK1_{it}$, $LSBLOCK2_{it}$ and $LSBLOCK3_{it}$	Are the percentage of voting rights held respectively by the largest, the second largest and the third largest shareholders of the company. The cutoff point to award the qualification blockholder is 10 % of voting rights
$LSBLOCK125_{it}$,	Is the percentage of voting rights held by the largest shareholder of the company. The cutoff point to award the qualification blockholder is 25 % of voting rights
$OWNER1_{it}$	OWN1 * $LSBLOCK1_{it}$ where OWN1 is a dummy variable that denotes low ownership concentration (>10 and <25 %)
$OWNER2_{it}$	OWN2 * $LSBLOCK1_{it}$ where OWN2 is a dummy variable that denotes intermediate (>25 and <50 %) ownership concentration
$OWNER3_{it}$	OWN3 * $LSBLOCK1_{it}$ where OWN3 is a dummy variable that denotes high (>50 %) ownership concentration
UO_{it}	Is a dummy variable that equals one if the largest shareholder is an ultimate owner (i.e., having one of the following type: Family; State)
LS_{it}	Is a dummy variable that equals one when we cannot identify the ultimate owner
IND_{it}	Is a dummy variable that equals one when according to the AMADEUS the shareholder are unable to exercise control over companies (i.e., having one of the following type: Public; Unnamed private shareholders, aggregated; Other unnamed shareholders, aggregated)
$BLOCK25_{it}$,	Is a dummy variable where a value of 1 is assigned for companies which the first largest shareholder has voting rights greater than 25 %
MLS_{it}	Is a dummy variable that equals one if there are at least two blockholders and zero otherwise. The cutoff point to award the qualification blockholder is 10 % of voting rights
$COALITION10_{it}$	$(LSBLOCK2_{it} + LSBLOCK3_{it})/(LSBLOCK1_{it} + LSBLOCK2_{it} + LSBLOCK3_{it})$. The cutoff point to award the qualification blockholder is 10 % of voting rights
$COALITION25_{it}$	This variable is constructed algebraically with the same formula of $COALITION10_{it}$. The cutoff point to award the qualification blockholder is 25 % of voting rights
FD_{it}	Is a dummy variable that equals one if the largest shareholder is an individual or a family with at least 10 % of the voting rights and zero otherwise. NFD_{it} is a dummy variable complementary
YD_{it}	Is a dummy variable that equals one if the company is young and zero otherwise. We consider a company as being young when the company age is below the mean value of this variable in our sample; NYD_{it} is a dummy variable complementary
Control variables	
$MKTB_{it}$	MVE_{it}/BVE_{it}, where MVE_{it} is the market value of equity and BVE_{it} is the book value of equity

Table 1 continued

Variable	Description
AGE_{it}	Ln ($YEARS_{it}$) where $YEARS_{it}$ is the number of years since the firm began its activity (Villalonga and Amit, 2006).
$SIZE_{it}$	Ln (Fixed $Assets_{it}$)
ROA_{it}	$EBITDA_{it}/TA_{it}$ where $EBITDA_{it}$ denotes earnings before interest, taxes, depreciation and amortization and TA_{it} is the book value of total assets
$TANG_{it}$	FA_{it}/TA_{it} where FA_{it} is the book value of the fixed assets and TA_{it} is Total Assets
TAX_{it}	The ratio of paid taxes to earnings before taxes
$NDTS_{it}$	The ratio of depreciation to total assets

Endogeneity is always cited as a crucial issue in investigating the effects of corporate governance mechanisms on company value. Recently, Wintoki et al. (2012) argue that such endogenous relations may be dynamic in the sense that, not only current actions of a firm affect future corporate value, but also that the actual performance in turn, affects the firms' future actions. Thus, ignoring dynamic endogeneity can lead to biased inferences about the relation between contestability and firm value. Moreover, it is important to control for past performance because it can be used as a proxy for governance attributes that are not directly observable, such as managerial ability, which in turn, is an important determinant of future governance structures and performance.

To control for such a dynamic endogeneity and unobservable heterogeneity, and following Wintoki et al. (2012), we use the dynamic panel GMM estimator, as proposed by Arellano and Bover (1995) and Blundell and Bond (1998). However, the dynamic panel estimation methodology has its limitations. Firstly, it relies on using lags of dependent and independent variables for identification. Thus, there is a potential problem with weak instruments that becomes greater as the number of lags of the instrumental variables increases. Secondly, we assume that errors are serially uncorrelated, but this may not hold with persistence in certain variables. Thirdly, heteroskedasticity represents a potential problem. However, it is fortunately controllable. We therefore present two-step estimates, which in theory provide robust results. Furthermore, the two-step estimator produces the robust *Hansen J-test.*

A small panel sample may produce downward bias of the estimated asymptotic standard errors in the two-step procedure. Therefore, we report corrected results using the Stata command "small" that produces a more accurate estimate by implementing the "Windmeijer correction" (Windmeijer 2005).

An optimal choice of instruments is a clear influence on the consistency of estimates. The validity of instruments is in turn influenced by the lack of higher-order serial correlation in the idiosyncratic component of the error term. Therefore, we report a test for the second-order serial correlation developed by Arellano and Bond (1991), the m_2 statistic. We also report the *Hansen J-statistic* of over-identifying restrictions in order to test for the absence of correlation between the

instruments and the error term. Tests for serial correlation in the first differenced residuals, denoted as m_1 and m_2, are reported in the tables of results. If the models' residual is white noise, then m_1 should be negative and statistically significant while m_2 is statistically insignificant.

The GMM system estimator makes one additional and final exogeneity assumption, that correlations between our regressors and the firm fixed-effects remain constant over time. This assumption allows for the use of lagged differences as instruments for the levels, and their inclusion in our GMM estimates. In this context, it is also important to test the validity of subsets of instruments (i.e. levels and differenced). We also report a difference-in-Hansen test (Roodman 2009) that evaluates if supplementary instruments required for systems estimation and used in the levels equation are valid and, therefore, have explanatory power. We empirically use a newly modified two-step system GMM estimator proposed by Windmeijer (2005). This is intended to address the downward bias in standard errors to conduct our analysis. The instrument set is limited using the technique of 'collapsing' some of the instruments (Roodman 2009).

The range of tests that have been carried out leads us to state that the examined statistical tests fulfill the key assumptions of GMM system estimation, and that the statistical generating mechanisms are appropriate models.

4 Empirical results

4.1 Descriptive statistics

The objective of our tests is to draw inferences concerning the relation between firm leverage and the concentration of the ownership, while controlling for a number of other factors. Table 2 reports the univariate statistics for the principal variables used in our paper over the whole sample period.

For the entire sample, we find that the market leverage average is 0.312 (median of 0.286). This figure is comparable to those found in the existing literature. For example, Ellul (2011) found the values of 0.284 and 0.230, respectively, for the market leverage mean and median, for a sample of 5,975 firms from 38 countries. As can be seen, this value reflects a significant heterogeneity among countries. Focusing on countries with more observations, it seems important to emphasize the similarity between the variable values in France and the UK. France presents an average (median) of 0.272 (0.254) and the UK an average (median) of 0.268 (0.230). Germany presents, as expected, higher values for debt: the average (median) leverage is 0.359 (0.336), which is close to the market leverage values of Ampenberger et al. (2011).

The ownership concentration values confirm previous research. As expected, there is a highly significant difference between the concentration of property in France and Germany where the main shareholder has, on average, about 50 % of voting rights, in comparison to the UK, where this value is 20 %. With respect to COALITION10_{it} we want to emphasize the homogeneity of values for the different countries.

Table 2 Descriptive statistics for key variables for different countries

Country	MARKET LEVERAGE				LSBLOCK1				COALITION10			
	Obs.	Mean	Median	SD	Obs.	Mean	Median	SD	Obs.	Mean	Median	SD
Belgium	40	0.280	0.221	0.194	40	0.570	0.530	0.187	34	0.381	0.370	0.143
Finland	200	0.321	0.319	0.195	177	0.360	0.342	0.169	116	0.451	0.478	0.137
France	755	0.272	0.254	0.183	748	0.491	0.490	0.170	658	0.396	0.411	0.138
Germany	385	0.359	0.336	0.219	380	0.500	0.496	0.189	333	0.415	0.450	0.158
Greece	370	0.409	0.414	0.202	363	0.369	0.332	0.164	281	0.462	0.487	0.123
Italy	30	0.208	0.142	0.140	30	0.297	0.203	0.184	19	0.440	0.420	0.103
Netherland	245	0.312	0.296	0.186	202	0.281	0.210	0.195	132	0.450	0.464	0.137
Portugal	95	0.561	0.569	0.225	91	0.340	0.288	0.171	71	0.452	0.465	0.137
Spain	70	0.373	0.348	0.199	63	0.313	0.243	0.182	49	0.492	0.500	0.142
Sweden	155	0.261	0.193	0.204	147	0.361	0.308	0.183	94	0.433	0.457	0.123
Switzerland	230	0.304	0.273	0.227	196	0.409	0.396	0.225	139	0.388	0.403	0.153
UK	895	0.268	0.230	0.192	648	0.199	0.157	0.118	340	0.480	0.479	0.117
Total	3,470	0.312	0.286	0.208	3,085	0.375	0.343	0.204	2,266	0.431	0.449	0.140

Table 3 reports descriptive statistics on leverage ratios and firm characteristics. We report the average values by family versus non-family firms. To investigate the differences that exist between family firms and non-family counterparts, we carry out several differences-of-means tests for all variables used in the multivariate analyses.

Family blockholders are the principal shareholder of about 22.76 % (702/3,085) of the firms when focusing on companies that are not widely held. Based on univariate evidence, family firms hold significantly higher levels of market leverage than non-family counterparts (respectively, 0.351 and 0.308). However, this evidence is preliminary, because it does not control for other determinants of financial policy choices, and does not account for the potential endogeneity of this variable; these issues will be addressed later in the study. In addition, we find that family firms do not differ with respect to the concentration of ownership of other companies, both in terms of mean and median, or even in terms of standard deviation of their values.

4.2 Regression results

4.2.1 Ownership concentration and capital structure

To apply the methodology, we consider the leverage variable, and the proxies for growth opportunity, age, size, profitability, asset tangibility, taxes, and non-debt tax shield, in order to compare our results set with previous ones. In addition, we include proxies for ownership concentration to study the effect of ownership control on leverage. Before presenting the results we would like to emphasize that in our main sample (3,740 observations) not all companies are led by blockholders (88.90 and 66.48 % of companies in our sample are not widely held, respectively placing the cutoff for voting rights at 10 and 25 %).

Regression 1 of Table 4 is in line with our first hypothesis, and is consistent with the argument that large shareholders are more risk averse and hence borrow less debt than other companies (Mishra and McConaughy 1999). This result is in line with those obtained by Stulz (1988), Ellul (2011), Bruslerie and Latrous (2012), Michaely and Vincent (2012) and Schmid (2013). Our results are also compatible with the thesis that attributes blockholders the ability to serve as an external disciplinary mechanism for management, lessening the need for internal disciplinary mechanisms such as debt (Moh'd et al. 1998). Alternative explanations are: (1) the fact that blockholders may prefer less debt if debt brings more monitoring (Jensen and Meckling 1976); (2) the biggest risk aversion relates to insolvency of blockholders as a result of having an under-diversified portfolio (Faccio et al. 2011); (3) the fact that debt limits the process of the appropriation of private earnings; (4) finally, the fact that blockholders mitigate the adverse selection costs of equity by reducing information asymmetry through information-gathering activities and trading patterns. As stated by Schmid (2013), this negative blockholder effect might be explained by the fact that their presence increases the firms' equity financing potential.

Table 3 Descriptive statistics

Variable	Family firms							Non-family firms							t test
	N	Mean	SD	25th percentile	Median.	75th percentile	Kurtosis	N	Mean	SD	25th percentile	Median	75th percentile	Kurtosis	
MARKET LEVERAGE	702	0.351	0.225	0.157	0.328	0.525	−0.877	2,383	0.308	0.205	0.148	0.284	0.439	−0.101	4.539
LSBLOCK1	702	0.363	0.171	0.223	0.332	0.500	−0.438	2,383	0.378	0.213	0.182	0.350	0.530	−0.656	−1.925
LSBLOCK2	542	0.217	0.083	0.157	0.200	0.263	0.035	1,724	0.204	0.091	0.126	0.183	0.262	0.174	3.566
COALITION10	542	0.458	0.128	0.374	0.472	0.572	−0.400	1,724	0.422	0.143	0.320	0.441	0.522	−0.737	6.372
MKTB	702	2.179	7.408	0.762	1.321	2.188	21.782	2,383	2.102	2.698	1.011	1.575	2.521	13.962	0.270
AGE	702	39.905	36.782	15.000	28.000	50.250	6.741	2,383	53.950	52.131	16.000	38.000	84.000	32.639	8.019
SIZE	702	14.106	2.947	11.662	13.504	17.000	−1.359	2,383	13.704	2.433	11.968	13.322	15.060	−0.053	3.298
ROA	702	0.102	0.082	0.062	0.098	0.142	6.228	2,383	0.107	0.080	0.068	0.104	0.144	6.011	−1.428
TANG	702	0.460	0.201	0.310	0.440	0.602	−0.493	2,383	0.499	0.192	0.364	0.491	0.626	−0.400	4.564
TAX	702	0.148	0.332	0.006	0.243	0.344	0.548	2,383	0.221	0.298	0.117	0.280	0.355	2.354	5.237
NDTS	702	0.045	0.042	0.021	0.037	0.058	21.925	2,383	0.050	0.043	0.027	0.042	0.062	82.820	−2.757

With the aim of determining the consistency of this result, we decided to test the same regression for a sub-sample in which all companies have at least one blockholder (Model 3 of Table 4) and another sub-sample in which we exclude the UK given the specificities of this country, when compared to the other countries of the sample, especially in terms of capital market development and in protecting minority shareholders' interests (model 4 of Table 4). Clearly, it is possible to claim that there is in fact a negative relationship between voting rights of the principal external blockholder and the companies' level of debt.

Secondly, and in line with interaction variables proposed by Margaritis and Psillaki (2010),[8] we test in model 2 of Table 4 if the relationship is linear and constant (the same regression was tested in the above sub-samples and the results were very similar). The equality of all coefficients is rejected at the 5 % level using the Wald test. Additionally, when we tested the equality of coefficients two by two, it is possible to reject this equality at the 1 % level, being the exception the equality between $OWNER2_{it}$ and $OWNER3_{it}$ that is only rejected at the 10 % level. The results suggest that the aversion to debt will successively be smaller as the main blockholder increases its control over the company.

Finally in model 5 of Table 4 we test if the ultimate owners behave differently from other shareholders. For this purpose we divided the blockholders in the three ad hoc subgroups. The first group of shareholders, which AMADEUS considers unable to exercise control over companies (i.e., having one of the following types: public; unnamed private shareholders, aggregated; other unnamed shareholders, aggregated); a second group in which we identify the ultimate owners (i.e., having one of the following types: family and state) and finally a third group of observations for which we do not know if we were dealing with the ultimate owners or not. As one can observe, we could not reject the null hypothesis when testing that they have the same behavior. When we test the hypothesis that all coefficients are statistically equal, it is not rejected by the Wald test.

The coefficient on the lagged leverage is significantly positive at the 1 % significance level in all our models. This supports the choice of a dynamic specification for modeling leverage adjustment and is consistent with capital structure trade-off theory. Furthermore, the control variables included in the analysis have a significant effect on regression. Firstly, firms facing high growth opportunities reduce leverage (the estimated coefficient on the market-to-book ratio is negative and statistically significant at the 1 per cent level in eight of the models presented), which supports Myers' view (1977) that high-growth firms prefer lower leverage to avoid potential agency problems related to underinvestment, consistent with Rajan and Zingales (1995) and Flannery and Rangan (2006). Since the agency costs of debt and financial distress costs are higher for firms with high value of

[8] As can be seen, our evidence does not confirm Margaritis and Psillaki's (2010) results for French firms. Margaritis and Psillaki (2010) found that in general firms with more concentrated ownership carry more debt in their capital structure. We could speculate that as the OLS methodology does not consider the problems arising from reverse causality between ownership concentration and debt. It may just happen that the blockholder seek more indebted companies once the same level of participation provides greater control in managing them.

Table 4 Ownership concentration and company leverage

	(1)	(2)	(3)	(4)	(5)
$MARKET\ LEVERAGE_{i.t-1}$	0.54159***	0.37962***	0.49545***	0.41033***	0.40109***
	(8.59)	(6.37)	(8.79)	(6.90)	(6.48)
$LSBLOCK1_{it}$	−0.00204***		−0.00215***	−0.00199***	
	(−2.65)		(−2.64)	(−2.66)	
IND_{it} *$LSBLOCK125_{it}$					−0.00184**
					(−2.42)
UO_{it}*$LSBLOCK125_{it}$					−0.00280**
					(−2.34)
LS_{it}*$LSBLOCK125_{it}$					−0.00134**
					(−2.21)
$OWNER1_{it}$		−0.00453***			
		(−3.07)			
$OWNER2_{it}$		−0.00254**			
		(−2.52)			
$OWNER3_{it}$		−0.00199**			
		(−2.40)			
$MKTB_{it}$	−0.00375**	−0.00321**	−0.00235**	−0.00580**	−0.00291*
	(−2.32)	(−2.08)	(−2.36)	(−2.16)	(−1.66)
AGE_{it}	0.01335**	0.01408**	0.01272**	0.02004**	0.01350*
	(2.56)	(2.40)	(2.54)	(2.55)	(1.78)
$SIZE_{it}$	0.04668***	0.04650***	0.03390***	0.05328***	0.04684***
	(4.55)	(5.78)	(3.96)	(3.85)	(4.67)
ROA_{it}	−0.59130***	−0.67493***	−0.61149***	−0.50624***	−0.62541***
	(−7.57)	(−8.15)	(−6.90)	(−5.32)	(−7.59)
$TANG_{it}$	0.25523***	0.17112***	0.21437***	0.43088***	0.16164**
	(2.96)	(3.58)	(3.85)	(4.06)	(1.78)

Table 4 continued

	(1)	(2)	(3)	(4)	(5)
TAX_{it}	0.00352**	0.00356***	0.00535***	−0.00246*	0.00370***
	(2.45)	(2.72)	(3.69)	(−1.74)	(2.81)
$NDTS_{it}$	0.32128**	0.41661***	0.21483**	0.39160**	0.43156***
	(2.25)	(3.26)	(2.41)	(2.46)	(3.16)
Constant	−0.66225***	−0.54543***	−0.42011***	−0.99902***	−0.60020***
	(−3.88)	(−4.26)	(−2.91)	(−3.65)	(−3.63)
z_1	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
z_2	[0.0860]	[0.0833]	[0.0002]	[0.0093]	[0.0002]
z_3	[0.0000]	[0.0001]	[0.0000]	[0.0002]	[0.0708]
z_4	[0.0976]	[0.0139]	[0.0640]	[0.2406]	[0.0001]
Number of firms	694	694	596	515	694
m_1	−6.68[0.000]	−5.74[0.000]	−6.17 [0.000]	−5.32 [0.000]	−5.84 [0.000]
m_2	0.25[0.799]	−0.25[0.803]	0.11 [0.909]	−0.28 [0.777]	−0.09 [0.925]
Wald (H_0 test of equality of the variables interaction)	–	[0.0101]	–	–	[0.2817]
Hansen J-statistics χ^2 = (46/72/43/52/57)	42.63[0.614]	73.26[0.437]	37.98 [0.688]	53.62 [0.412]	59.88 [0.372]
Diff-in-Hansen tests of exogeneity χ^2 = (27/33/27/27/25)	27.01[0.463]	31.01[0.567]	26.19 [0.508]	29.10 [0.356]	21.70 [0.653]
IV	[0.699]	[0.552]	[0.590]	[0.565]	[0.572]
VIF(MEAN/MAX)	(1.28/1.06)	(2.11/1.35)	(1.15/1.04)	(1.18/1.08)	(1.12/1.26)

This table provides the estimated coefficients from the two-step robust system GMM estimator with Windmeijer (2005) corrected standard error. A detailed definition of all variables can be found in Table 1. We controlled time, sector and institutional effects. z_1, z_2, z_3 and z_4 are Wald tests for the joint significance of the estimated coefficients, the time effect, country effect and sector effect; m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation. The Hansen test is a test of overidentifying restrictions, asymptotically distributed as χ^2 under the null hypothesis of no correlation between the instruments and the error term. The difference in Hansen test of exogeneity has a null hypothesis that the levels of instruments in the GMM and the IV (year, country and sector indicators) are exogenous. VIF (variance inflation factor) test the absence of multicollinearity. Figures in parentheses are t-statistics (t-statistics are based on robust, firm-clustered standard errors) while *p* values are in brackets. *, ** and *** indicate statistical significance at 10, 5, and 1 % levels respectively

market-to-book ratio, lenders demand higher return rates and thus, debt is less attractive.

The relationship between leverage and the tangibility of assets is significantly positive, suggesting that tangible assets are more valuable to creditors, consistent with the findings of Titman and Wessels (1988), Rajan and Zingales (1995), Booth et al. (2001), Flannery and Rangan (2006), Frank and Goyal (2009), Lemmon et al. (2008) and Hirsch and Walz (2011). As we shall observe, our results confirm that the effect of asset tangibility on corporate debt is more prominent in bank oriented economies (Continental Europe) than in capital market oriented economies (United Kingdom).

In line with the results of Rajan and Zingales (1995), Gaud et al. (2005) and Margaritis and Psillaki (2010), this study supports the pecking order theory that high profit firms use internal financing (successful companies do not need to depend so much on external funding), while low profit firms use more debt because their internal funds are not sufficient. This result does not support Jensen's (1986) free cash flow theory or the trade-off theory of capital structure (Graham 2000).

Consistent with the results of Flannery and Rangan (2006), our findings show that the size of the firm is positively related to debt. Larger firms provide more information to current and potential lenders, and have more stable cash flow. Therefore, they are less exposed to bankruptcy risk and hence, are likely to be able to borrow more. Large firms face lower agency costs of debt and, therefore, prefer more debt in their capital structure according to the agency view of the trade-off theory. This result once again supports the idea of debt being an instrument of governance and as helping to solve problems of free cash flow that particularly affect larger companies.

Contrary to Titman and Wessels' (1988) results, the role of the effective tax rate on market leverage is statistically significant. As expected, the age of the firm is positively related to the leverage ratio (Haas and Peeters 2006). Older firms have lower information asymmetries between all stakeholders, and a history of relationships with its lenders (reputation) that increases the borrowing capacity. The coefficient of non-debt tax shield is positive and significant at the 1 % level, which is consistent with the argument of Moh'd et al. (1998) that if firms have more non-debt tax shield then they also have a higher proportion of depreciations (in relative terms). Therefore, they will have a higher level of tangibility which in turn, gives them a higher debt capacity.

We would like also to emphasize that the country dummies associated with the four groups according to their legal origin (Common-law origin; German origin; Scandinavian origin; French origin) are all significant at the 1 % level.

4.2.2 Contestability and leverage

In this section we explore how the contestability of the major blockholder, by other blockholders, affects the leverage level. We first explore whether the existence of a second shareholder with more than 10 % of voting rights increases the leverage.

The results of the regression in column 1 of Table 5 support the view that the main blockholder uses leverage when their ability to conduct political firms in favor

Table 5 Contestability and company leverage

	(1)	(2)	(3)	(4)	(5)
$MARKET\ LEVERAGE_{i,t-1}$	0.50041***	0.40519***	0.39192***	0.44525***	0.39414***
	(7.28)	(7.13)	(6.70)	(4.52)	(6.64)
$LSBLOCK1_{it}$	−0.00231***	−0.00200***		−0.00270***	−0.00177***
	(−2.87)	(−2.66)		(−2.60)	(−2.87)
$LSBLOCK125_{it}$			−0.00187***		
			(−2.84)		
MLS_{it}	0.02602**			0.02659**	0.02612**
	(2.47)			(2.57)	(2.21)
$COALITION10_{it}$		0.11868***			
		(3.02)			
$COALITION25_{it}$			0.07899***		
			(2.70)		
$MKTB_{it}$	−0.00319***	−0.00208***	−0.00258*	−0.00163*	0.00721**
	(−2.62)	(−2.86)	(−1.90)	(−1.80)	(2.25)
AGE_{it}	0.01472***	0.02269***	0.01560**	0.01716**	0.02015**
	(3.00)	(3.42)	(2.50)	(2.57)	(2.59)
$SIZE_{it}$	0.04475***	0.05550***	0.04878***	0.05153***	0.05057***
	(6.11)	(6.85)	(6.02)	(5.44)	(5.29)
ROA_{it}	−0.60530***	−0.58905***	−0.66840***	−0.56075***	−0.52327***
	(−8.03)	(−6.86)	(−8.28)	(−6.52)	(−5.23)
$TANG_{it}$	0.20996***	0.16798**	0.16494**	0.25589***	0.38354***
	(4.75)	(2.32)	(2.18)	(4.79)	(3.63)
TAX_{it}	0.00340**	0.00305**	0.00359***	0.00491***	−0.00253**
	(2.55)	(2.16)	(2.88)	(3.61)	(−2.28)

Table 5 continued

	(1)	(2)	(3)	(4)	(5)
$NDTS_{it}$	0.38853***	0.36314**	0.46123***	0.39887**	0.33942**
	(2.88)	(2.46)	(3.68)	(2.56)	(1.99)
Constant	−0.61559***	−0.79322***	−0.63735***	−0.74288***	−0.95921***
	(−5.24)	(−5.96)	(−4.89)	(−4.70)	(−4.65)
z_1	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
z_2	[0.0120]	[0.0000]	[0.0000]	[0.0173]	[0.0003]
z_3	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
z_4	[0.0403]	[0.0084]	[0.0164]	[0.0607]	[0.1465]
Number of firms	694	694	694	596	515
m_1	−5.86[0.000]	−6.24[0.000]	−5.98 [0.000]	−4.75 [0.000]	−5.25 [0.000]
m_2	0.06[0.951]	−0.13[0.899]	−0.02 [0.986]	0.17 [0.864]	−0.30 [0.762]
Hansen J-statistics $\chi^2 = (49/58/56/39/63)$	45.38[0.621]	57.72[0.486]	52.96 [0.591]	39.56 [0.445]	60.81 [0.555]
Diff-in-Hansen tests of exogeneity $\chi^2 = (29/30/23/22/30)$	29.71[0.429]	30.28[0.451]	19.62 [0.665]	20.40 [0.558]	27.99 [0.571]
IV	[0.388]	[0.801]	[0.794]	[0.487]	[0.394]
VIF(MEAN/MAX)	(1.14/1.06)	(1.14/1.04)	(1.14/1.05)	(1.15/1.04)	(1.18/1.07)

This table provides the estimated coefficients from the two-step robust system GMM estimator with Windmeijer (2005) corrected standard error. A detailed definition of all variables can be found in Table 1. We controlled time, sector and institutional effects. z_1, z_2, z_3 and z_4 are Wald tests for the joint significance of the estimated coefficients, the time effect, country effect and sector effect; m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation. The Hansen test is a test of overidentifying restrictions, asymptotically distributed as χ^2 under the null hypothesis of no correlation between the instruments and the error term. The difference in Hansen test of exogeneity has a null hypothesis that the levels of instruments in the GMM and the IV (year, country and sector indicators) are exogenous. VIF (variance inflation factor) test the absence of multicollinearity. Figures in parentheses are t-statistics (t-statistics are based on robust, firm-clustered standard errors) while p-values are in brackets. *, ** and *** indicate statistical significance at 10, 5, and 1 % levels respectively

of their interests is placed in question by a second blockholder (the coefficient of the variable MLS_{it} is positive and statistically significant at 5 % level). Stated differently, the presence of multiple controlling blockholders with comparable voting rights, and thus a high risk of control contestability of the largest shareholder, signifies that the latter exhibits a lower risk aversion due to increased debt and a higher weighting on the fact that the debt ensures the prevalence of their interests in the conduct of business.

An alternative explanation suggests that the main blockholder tends to choose a level of debt that departs from the level of debt that other blockholders perceive to be optimal (it is assumed that the level of debt required by the second blockholder is brought closer to a level that would be more interesting to minority shareholders who, by nature, have lower concerns about the company's risk and a short-term investment horizon). According to this view of the problem, the increase in debt would be the result of the capacity of the second blockholder to impose their interests, which are distinguished by the fact that the second blockholder has a lower risk aversion and sees in debt a way to limit possible opportunistic behavior of the main blockholder. This reasoning is in line with the theoretical models of Bennedsen and Wolfenzon (2000), Gomes and Novaes (2006) and Pagano and Roëll (1998), which suggest that complex structures, as an internal governance mechanism, are potentially able to align the interests of blockholders with those of minority shareholders.

It is important to stress that, as proposed by Laeven and Levine (2008), we decided to empower only the blockholder effect of the main shareholder. Multicollinearity problems were substantially higher when we tried to explore the Jara-Bertin et al. (2008) formulation empowering the effects of the second and third blockholders.

Additionally, we investigate the firms' ownership concentration and the coalition interactions that may occur between the principal blockholder and other shareholders. In order to do so, we introduce the variable $COALITION10_{it}$. Once more (column 2 of Table 5), we find that debt in blockholder controlled firms is used more often when the main blockholder is more challenged by other blockholders.

A final alternative explanation of this result is that the presence of other large shareholders (beyond the first blockholder) enhances price informativeness and reduces wealth diversion, thereby, reducing the costs of external finance, which in turn encourages the increase in debt. In this line of thought, Attig et al. (2008) stress that the existence of a second blockholder implies lower financing costs, when compared to firms with a single controlling shareholder. These results are consistent with our second hypothesis.

The full sample was tested with a 25 % cutoff value to verify if the result remains unchanged, which, with reference to column 3 of Table 5, was confirmed; in this model, the cutoff point for the consideration of the existence of blockholders is 25 % of the voting rights. Finally, in columns 4 and 5 of Table 5, in line with the approach taken for the blockholder effect, we tested whether the same effect is observed either in the sub-sample in which all companies have at least one blockholder (596 firms) or in the sub-sample that excludes the United Kingdom

(515 Firms). As noted, the contestability effect remains unchanged regardless of the sample considered, which is a powerful test result.

4.2.3 Family shareholding and leverage

The behavior of the largest owners may differ depending on whether they are agents or families, since there is a much clearer relationship between the market value of equity and the wealth of the largest owner in the latter case. In order to test whether the effects of the largest owners' control rights differ according to the type of owner, we use interactive variables to identify the largest owner as being a family or a non-family investor. We would like to emphasize that the limitations of the AMADEUS database, particularly the identification of the 'ultimate owner', are irrelevant when we focus on family firms. Maybe there are other family firms in our sample; however, we could not identify them in the AMADEUS database. Thus, relating our results with the behavior of the ultimate owners should be done parsimoniously. The results are shown in Table 6.

According to column 1 of Table 6, we can see that family businesses have debt levels below those of non-family firms (contrary to the descriptive statistics in Table 3). Although previous research is not conclusive, there is still a predominance of symmetrical results to show this (Croci et al. 2011; Ellul 2011**).** This result supports our hypothesis 3 and a broad set of theoretical arguments mentioned when referring to the third hypothesis, which suggests that family businesses tend to use less debt than non-family firms. This result is also consistent with Faccio and Masulis (2005), who find that European controlling shareholders prefer to use cash as method of payment in acquisitions for control considerations. Recently, also Ampenberger et al. (2011) and Schmid (2013) presents evidence that German family firms use less debt than non-family firms. This result, though expected, is challenging vis-à-vis of Croci et al.'s (2011) investigation as their sample is very close to ours. At a prima facie level, we conjecture that these results may, to some extent, be explained by the fact that Croci et al.'s (2011) methodology using OLS estimation has some unresolved problems of unobservable heterogeneity and endogeneity (Wintoki et al. 2012), and consequently their results may be biased because the OLS estimation ignores unobservable heterogeneity. Nevertheless, we decided to test our results with a sample excluding the UK, thereby bringing our sample closer to Croci et al.'s (2011). The use of this subsample is also supported by previous research. Rajan and Zingales (1995) state that the main factors influencing firms' leverage are the cross-country differences in tax and bankruptcy codes, corporate control, and the role played by banks and security markets. Also important is the widespread provision of corporate financing by banks in Continental Europe in contrast to the financing structure of the United Kingdom, which is more market-based. Demirgüc-Kunt and Maksimovic (1996) confirm that the development level of financial markets has a significant impact on a company's financing policies.

In model 2 of Table 6 we present the results for a sample that excludes the UK, with a cutoff of 10 %. To our surprise the dummy variable coefficient that identifies family firms is positive and, as in model 1, statistically significant at the 1 % level. We are aware that regardless of the methodology used, there will be always some

Table 6 Family firms and leverage

	(1)	(2)	(3)	(4)	(5)
$MARKET\ LEVERAGE_{i,t-1}$	0.50224***	0.48557***	0.53221***	0.43422***	0.51846***
	(9.16)	(7.58)	(8.60)	(8.02)	(7.94)
$LSBLOCK1_{it}$	−0.00196***	−0.00182***			−0.00191**
	(−2.75)	(−2.61)			(−2.57)
$LSBLOCK125_{it}$			0.00067**	−0.00176***	
			(2.35)	(−2.62)	
FD_{it}	−0.11717***	0.04210***			−0.09073***
	(−3.98)	(2.84)			(−2.99)
$BLOCK25_{it} * FD_{it}$			−0.09844***	0.07268***	
			(−2.74)	(3.51)	
$MKTB_{it}$	−0.00258*	−0.00601**	−0.00287**	−0.00739**	−0.00239**
	(−1.76)	(−2.29)	(−2.13)	(−2.56)	(−1.97)
AGE_{it}	0.01181*	0.02082***	0.01348**	0.02493***	0.02007***
	(1.89)	(3.14)	(2.30)	(2.81)	(3.03)
$SIZE_{it}$	0.04136***	0.04466***	0.03892***	0.05103***	0.04073***
	(5.37)	(4.38)	(5.17)	(4.80)	(3.53)
ROA_{it}	−0.64156***	−0.54791***	−0.65064***	−0.52797***	−0.57447***
	(−8.90)	(−6.00)	(−8.73)	(−5.71)	(−6.67)
$TANG_{it}$	0.16418***	0.40904***	0.14155**	0.38377***	0.21376***
	(3.17)	(3.73)	(2.41)	(3.64)	(3.54)
TAX_{it}	0.00248*	−0.00261**	0.00178**	−0.00223**	0.00497***
	(1.85)	(−2.18)	(2.25)	(−1.99)	(3.33)
$NDTS_{it}$	0.35976***	0.32435*	0.29188**	0.41024**	0.27585***
	(2.87)	(1.96)	(2.39)	(2.45)	(2.70)

Table 6 continued

	(1)	(2)	(3)	(4)	(5)
Constant	−0.49363***	−0.93488***	−0.54272***	−1.06440***	−0.55211***
	(−4.06)	(−4.12)	(−4.04)	(−4.49)	(−2.78)
z_1	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
z_2	[0.0031]	[0.0067]	[0.0017]	[0.0005]	[0.0005]
z_3	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
z_4	[0.0802]	[0.1191]	[0.2477]	[0.0732]	[0.1520]
Number of firms	694	515	694	515	596
m_1	−6.90[0.000]	−5.54 [0.000]	−6.28 [0.000]	−5.64 [0.000]	−6.16 [0.000]
m_2	−0.49 [0.625]	−0.05[0.962]	0.14 [0.891]	−0.16 [0.870]	0.24 [0.810]
Hansen J-statistics χ^2 = (67/56/45/59/49)	62.71[0.626]	58.40 [0.387]	44.43 [0.496]	59.92 [0.442]	44.82 [0.643]
Diff-in-Hansen tests of exogeneity χ^2 = (40/30/23/27/30)	40.84[0.433]	22.91[0.506]	22.66 [0.481]	19.82 [0.838]	30.37 [0.447]
IV	[0.482]	[0.609]	[0.719]	[0.695]	[0.487]
VIF(MEAN/MAX)	(1.14/1.04)	(1.18/1.08)	(1.14/1.06)	(1.18/1.08)	(1.15/1.05)

This table provides the estimated coefficients from the two-step robust system GMM estimator with Windmeijer (2005) corrected standard error. A detailed definition of all variables can be found in Table 1. We controlled time, sector and institutional effects. z_1, z_2, z_3 and z_4 are Wald tests for the joint significance of the estimated coefficients, the time effect, country effect and sector effect; m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation. The Hansen test is a test of overidentifying restrictions, asymptotically distributed as χ^2 under the null hypothesis of no correlation between the instruments and the error term. The difference in Hansen test of exogeneity has a null hypothesis that the levels of instruments in the GMM and the IV (year, country and sector indicators) are exogenous. VIF (variance inflation factor) test the absence of multicollinearity. Figures in parentheses are t-statistics (t-statistics are based on robust, firm-clustered standard errors) while p-values are in brackets. *, ** and *** indicate statistical significance at 10, 5, and 1 % levels respectively

particular problems with data as well as with samples. Nevertheless, the result is surprising given the generalization of studies using samples grouping different countries and analyzing heterogeneity through country dummy variables. The main concern is not the smaller absolute value of the coefficient or the result being statistically less significant, but rather the change of sign of the coefficient as well as having a significant family dummy at the 1 % level for both samples.

As a first action test, we tested if the results remained statistically different if we changed the cutoff from 10 to 25 % of the voting rights. As can be seen in models 3 and 4 of Table 6 (obtained respectively with the full sample and excluding the UK from the sample) results remained different and statistically significant at 1 % level while the difference of absolute value of the coefficients also increased.

Then we tested whether there was any particular characteristic of the full sample which could explain the negative coefficient. First, we tested if the coefficient remained negative with the requirement of all observations having at least one blockholder (model 5 of Table 6). As noted the coefficient remained negative and statistically significant at the 1 % level.

In a second regression, we tested whether the firm's age was relevant in this discussion. As showed in model 1 of Table 7 this result is moderated by company age: older firms present a greater aversion to debt. This result suggests that older family firms have no interesting investments to apply their cash flows to. Thus, they have free cash flow, which allows for the reduction of debt (pecking order theory). As both coefficients are negative this variable does not help to clarify the problem.

The model presented in column 2 has a double purpose of noticing if the contestability effect is different in family firms and if the result helps explain the fact that in this sample family firms possess less debt. In contrast with recent research conducted by Paligorova and Xu (2012) for listed firms in G7 countries, we conclude that the contestability effect is greater in family firms but again we do not get an explanation for our problem.

Additionally, we decided to test if the results are altered winsorizing the dependent variable at 0.05 and 0.95. We present results only for the regression sample excluding the United Kingdom, which is substantially smaller and, consequently, with a higher likelihood of outliers biasing results. It is important to stress that the above procedure led to winsorized family firm values of 0.04 and 0.93 (which is nonetheless convenient since outliers that really concern us are those that reflect extremely high debt values). As can be seen in model 3 of Table 7, the coefficient remains positive despite the unusual treatment of outliers.

Our paper offers new evidence that the institutional environment is important in family firms. In the absence of more information to carry out further tests, we can conclude that the signal of the coefficient can be attributed to the institutional context of the UK.

Firstly, our results for family firms support a broad consensus in corporate finance: the role of bank finance in countries with a common law legal system is lesser than in non-common law countries. Rajan and Zingales (1995) and Demirgüc-Kunt and Maksimovic (1996) found that firms in bank-based countries have more debt than firms in market-based countries. Secondly, this result for family firms

Table 7 Robustness of family effect for a cutoff of 10 %

	(1)	(2)	(3)	(4)	(5)
$MARKET\ LEVERAGE_{i,t-1}$	0.51093***	0.39081***	0.49697***	0.46825***	0.45517***
	(8.91)	(6.55)	(7.81)	(7.79)	(7.34)
$LSBLOCK1_{it}$	−0.00178**	−0.00244***	−0.00179***		
	(−2.40)	(−2.64)	(−2.68)		
FD_{it} *YD_{it}	−0.05518**				
	(−2.40)				
FD_{it} *NYD_{it}	−0.13374***				
	(−3.52)				
FD_{it}*$COALITION10_{it}$		0.23261***			
		(3.46)			
NFD_{it}*$COALITION10_{it}$		0.10449**			
		(2.21)			
FD_{it}			0.03892***		
			(2.85)		
$BLOCK25_{it}$				−0.12367***	
				(−2.89)	
FD*$BLOCK25_{it}$					−0.16281***
					(−3.31)
NFD*$BLOCK25_{it}$					−0.08172**
					(−2.06)
$MKTB_{it}$	−0.00251*	−0.00206**	−0.00585**	−0.00254**	−0.00337*
	(−1.65)	(−2.07)	(−2.12)	(−2.22)	(−1.93)
AGE_{it}	0.01551**	0.02572***	0.02130***	0.01229**	0.01381**
	(2.26)	(3.61)	(3.09)	(2.28)	(1.97)

Table 7 continued

	(1)	(2)	(3)	(4)	(5)
$SIZE_{it}$	0.04403***	0.06117***	0.04290***	0.04817***	0.04725***
	(5.26)	(5.30)	(4.52)	(4.58)	(5.43)
ROA_{it}	−0.64682***	−0.57269***	−0.52900***	−0.68769***	−0.61794***
	(−8.66)	(−6.85)	(−5.90)	(−8.57)	(−7.31)
$TANG_{it}$	0.16378.***	0.25411***	0.42651***	0.17976***	0.23741**
	(3.05)	(3.32)	(3.98)	(3.46)	(2.20)
TAX_{it}	0.00258*	0.00369**	−0.00255**	0.00416***	0.00342**
	(1.84)	(2.46)	(−2.16)	(3.33)	(2.37)
$NDTS_{it}$	0.33246**	0.42294***	0.30839*	0.37568***	0.26257*
	(2.57)	(2.93)	(1.96)	(2.72)	(1.85)
Constant	−0.55026***	−0.93842***	−0.91695***	−0.60101***	−0.63495***
	(−4.21)	(−4.68)	(−4.26)	(−3.51)	(−4.45)
z_1	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
z_2	[0.0060]	[0.0009]	[0.0043]	[0.0001]	[0.0002]
z_3	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
z_4	[0.1304]	[0.0335]	[0.1293]	[0.0508]	[0.0844]
Number of firms	694	694	515	694	694
Wald (H_0 test of equality of the variables interaction)	[0.0440]	[0.0409]	–	–	[0.0030]
m_1	−6.95[0.000]	−6.43 [0.000]	−5.49 [0.000]	−6.46 [0.000]	−6.10 [0.000]
m_2	−0.18 [0.857]	0.06 [0.951]	−0.09 [0.931]	−0.10 [0.920]	−0.36 [0.715]
Hansen J-statistics χ^2 = (69/39/66/41/48)	64.04[0.647]	36.34[0.592]	59.36[0.462]	38.31 [0.591]	43.43 [0.660]

Table 7 continued

	(1)	(2)	(3)	(4)	(5)
Diff-in-Hansen tests of exogeneity χ^2 = (40/25/39/22/25)	42.66[0.357]	21.19[0.682]	22.11[0.850]	24.01 [0.346]	16.81 [0.889]
IV	[0.433]	[0.913]	[0.578]	[0.522]	[0.624]
VIF(MEAN/MAX)	(1.14/1.06)	(1.18/1.07)	(1.18/1.08)	(1.14/1.04)	(1.26/1.12)

This table provides the estimated coefficients from the two-step robust system GMM estimator with Windmeijer (2005) corrected standard error. A detailed definition of all variables can be found in Table 1. We controlled time, sector and institutional effects. z_1, z_2, z_3 and z_4 are Wald tests for the joint significance of the estimated coefficients, the time effect, country effect and sector effect; m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation. The Hansen test is a test of overidentifying restrictions, asymptotically distributed as χ^2 under the null hypothesis of no correlation between the instruments and the error term. The difference in Hansen test of exogeneity has a null hypothesis that the levels of instruments in the GMM and the IV (year, country and sector indicators) are exogenous. VIF (variance inflation factor) test the absence of multicollinearity. Figures in parentheses are t-statistics (t-statistics are based on robust, firm-clustered standard errors) while p-values are in brackets. *, ** and *** indicate statistical significance at 10, 5, and 1 % levels respectively

confirms previous research (Alves and Ferreira 2011), whose empirical evidence supports a negative relationship between shareholder rights and market leverage.

Thirdly, despite the information limitations previously outlined, we could not help noticing that families rely more on debt in civil law countries. This result is consistent with the fact that ownership concentration is particularly relevant in these countries (weaker investor protection) as well as with the fact that family firms might prefer debt financing as opposed to equity financing for control motivations (King and Santor 2008; Ellul 2011; Croci et al. 2011).

In Model 4 of Table 7, we test the consistency of our results for the blockholder effect through a dummy variable that identifies firms with at least one blockholder (this is the main sample with a cutoff of 25 % of the voting rights. We do not test, the same effect for a cutoff of 10 %, since in this case only 11.10 % observations were widely held). The coefficient of the dummy variable (statistically significant at the 1 % level) confirms previous results: blockholder led companies use less debt than the widely held companies.

Finally, we decided to test if the last result is different between family and non-family firms. As can be seen, the coefficient of family firms is larger in absolute value than that observed among the non-family firms. When we test the hypothesis that the coefficients are statistically equal, it is rejected by the Wald test at the 1 % level. This last result confirms, once again, that family firms are less indebted when compared to companies with other types of dominant shareholder.

4.2.4 Robustness tests

We assessed the robustness of our results to a set of extensions. Firstly, we tested all the models with another dependent variable earlier mentioned: Book Leverage. The results remained very similar to the ones we obtained using market leverage. We also examined if the firms where the main blockholder has a dominant position (control rights in excess of 50 %) differ from those where the main blockholder has no dominant position. Using a dummy variable that identifies the existence of majority blockholders, the results show that these companies are more indebted than their counterparts.

We tested the contestability effect in line with that suggested by Konijn et al. (2011) using (scaled) Herfindahl index (the use of the scaled Herfindahl index allows us to separate the effect of dispersion from the effect of total combined block ownership) and $GINI_{it}$ (this last measure of dispersion depends mainly on the asymmetry of the blocks, and much less on the number of blocks) variables. More dispersion implies a lower value of the (scaled) Herfindahl index and the Gini coefficient. The coefficients are in line with those obtained for the variable $COALITION10_{it}$. Thus, we conclude that the contestability effect is robust to changing the proxy used.

5 Conclusion

In this paper, we analyze the relationship between firms' ownership concentration and leverage level, using a sample of 694 Western Europe firms during the calendar

years of 2002 to 2006. This helps to improve our understanding of capital structure determinants. Our results support a negative relationship between leverage and ownership concentration in Western Europe firms. We interpret this evidence as consistent with: (1) the hypothesis of substitution between capital structure and the ownership structure as mechanisms of corporate governance; (2) their increased risk aversion as a result of having a poorly diversified investment portfolio; (3) the fact that debt imposes limits on the behavior of blockholders; (4) the desire for lenders of debt to prevent the monitoring of their behavior (Jensen and Meckling 1976); and finally, as stated by Schmid (2013), this negative blockholder effect might be explained by the fact that their presence increases the firms' equity financing potential.

Additionally our evidence allows us to suggest that the aversion to debt by the main blockholder has a negative correlation with the concentration of ownership in the hands of this blockholder. In our opinion, this behavior has a plausible explanation in fact that the debt allowing a reduction of business risk exposure and for very high levels of ownership concentration this risk decreases the aversion to debt already stated before.

We find evidence of leverage increasing in the presence of complex structures. This indicates that the presence of multiple controlling shareholders with comparable voting rights determines on the main blockholder a different weighting of the advantages and disadvantages of debt. Stated differently, the main blockholder, in these circumstances, seems to give a greater importance to debt in maintaining the relative positions of the different blockholders and thus the prevalence of their interests in the conduct of the various policies of the company. That is, the main blockholder uses leverage when the existence of other blockholders jeopardizes its dominance.

On the other hand, high control contestability reduces the autonomy of the main blockholder in the conduct and destination of businesses. In this context, other blockholders see debt as a way to reduce agency problems, and to control the blockholders' opportunistic behavior, manifested by the inefficient application of free cash flow. Finally, the increased level of debt can be the result of increased contestability, determining an increase of the firm's information quality and penalizing any behavior that deviates from the interests of minority shareholders. Higher transparency can also result in a reduction of agency problems between blockholders and creditors.

Our paper offers new evidence that the institutional environment is important in family firms. Our results for family firms suggest that capital structure decisions are not only the product of a firm's own characteristics, but also the result of ownership concentration, the identity of the principal blockholder, the legal framework and institutional environment of the countries in which the firm operates. We show that family firms do have significant impact on firms' leverage level, and this impact varies according to the different legal frameworks and institutional environments. In the sample of all companies, the results show the negative effect of family firms on market leverage, supporting the theory that family firms are more averse to increase the debt level because of the risk of bankruptcy and financial distress as a result of having under-diversified portfolios. Moreover, this particular type of blockholder

privileges the long-term evaluation of investment opportunities and the maintenance of family ties. In addition, the coincidence of interests between control and management results in lower agency costs. Thus, the disciplinary effect of debt, as proposed by Jensen (1986), becomes less relevant. Other potential reasons for this evidence include a restricted access to debt markets due to family firm characteristics, or a motivation to avoid monitoring by the lenders (Mishra and McConaughy 1999).

In contrast, and in line with the investigation of Antoniou et al. (2008), companies in continental Europe borrow more than British firms. This last result cannot be explained by agency theory given that family businesses are those that suffer less from Type I agency problems (family blockholders tend to exercise their control not only through ownership, but also through an active family involvement in firms' management). This result suggests either greater difficulty in financing their investments by issuing new equity or the need to signal through debt the quality of its investments. Banks, as creditors, can have the certification effect by signaling to the market that the firm will have a stable cash flow and low risks. Additionally, as Anderson et al. (2003) conclude, family firms mitigate agency conflicts between shareholders and debtholders, which allows family companies to have a lower cost of debt financing.

In conclusion, where capital market institutions are ineffective (shareholders and creditor rights are not well protected) higher debt levels in family firms may serve to mitigate agency problems between external blockholders and outside minority shareholders, and to signal to the market the quality of their investments (the problems of information asymmetry are more relevant in civil law countries). By contrast, in common law countries, family firms have an open access to equity markets and mainly rely upon equity as regards financing. Additionally, and consistent with Antoniou et al. (2008) and Schmid (2013), our results suggest that to avoid bankruptcy family businesses in countries with higher creditor rights keep their leverage ratio lower than non-family firms.

Despite the efforts to make sure our analyses are as rigorous as possible, our study is subject to several limitations, which should be addressed in future research. First, we did not have access to information about the ultimate owners and the difference between control and cash flow rights. Second, the number of years used for the panel data might be considered limited. The access to information for the period 2007 to 2010 would have allowed not only to study the role of blockholders in Europe through the recession, as well as to meet the requirements imposed by our methodology (dynamic estimation) which requires, in particular, that we assume transient errors are uncorrelated. To mitigate this concern, and the fact that ownership structure is highly persistent, we can take samples at two-year intervals instead of every year. Third, corporate governance mechanisms may be more effective when functioning as a group in explaining debt in the largest public Western European firms. An interesting avenue for further research would focus on other corporate policy decisions (dividends and investment policies) in order to increase our understanding of the particularities of family businesses and a more definitive conclusion surrounding their advantages and disadvantages over their counterparts.

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