# Diversification strategies, family ownership and debt policy: New evidence from international panel data*

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## Abstract

We investigate how product diversification strategies affect corporate debt decisions in an international context. We study the effect of related and unrelated diversification on debt and how family ownership moderates this effect. Related diversification has a negative impact on debt financing in non-family firms, and the effect is non-linear in family firms. Unrelated diversification has a non-linear effect on debt regardless of ownership structure, but the positive effect is stronger in family firms. We also analyze how having a financial firm as the second largest shareholder and managerial ownership moderate the relation between diversification and debt in family firms. Both governance characteristics make the non-linear effect of diversification on debt more pronounced, leading to higher debt when diversification reaches the optimal level.

*Keywords:* product diversification, capital structure, corporate governance, family ownership.
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## 1. Introduction

Although previous studies highlight the importance of corporate strategy for capital structure (Barton & Gordon, 1987), the effect of strategic policies on the debt decision is not conclusive (Ngah-Kiing Lim, Das, & Das, 2009). Regarding corporate diversification decisions, these authors consider product and geographic diversification. However, regardless of the type of diversification strategy analyzed, there are several obstacles that make it difficult to find conclusive empirical evidence. Among the challenges faced by researchers to reach a consensus, one can include the different geographic coverage of previous works and the various ways in which firms can diversify (i.e., related or unrelated diversification). In addition, another problem that affects prior research is associated with the fact that diversification and leverage decisions can influence each other and can be made simultaneously by managers (Doukas & Kan, 2006; Low & Chen, 2004), which creates additional problems to establish causality without any kind of ambiguity.

In this regard, O'Brien, David, Yoshikawa, & Delios (2014) investigate how debt influences firm diversification strategies. Their perspective suggests that the mixed empirical results in previous related literature may be caused by the complex relationship between diversification and capital structure. Diversification strategies are likely to influence capital structure. But corporate strategy should be considered endogenous because it is in turn a function of other firm and governance characteristics that may also affect debt decisions. Moreover, the relationship between debt and diversification can go in both directions. While ex post (i.e., after a firm has diversified) cash flows from diversification can help firms to maintain higher levels of debt, ex ante (i.e., before diversification) having too much debt could constrain a firm's ability to diversify.

In addition, the way in which the diversification strategy is measured can lead to various results, causing ambiguous interpretations. For example, it is not yet entirely clear whether, on the one hand, diversifying does not actually increase firm borrowing capacity or whether, on the other hand, the diversification strategy indeed increases this capacity, but

managers do not take advantage of it and prefer to maintain firm debt levels relatively constant (Comment & Jarrell, 1995).

Most previous research that examines the relation between diversification and capital structure is carried out in a single-country context (Barton & Gordon, 1988; Fatemi, 1988; Burgman, 1996; Chen, Cheng, He, & Kim, 1997; Kochhar & Hitt, 1998; La Rocca, La Rocca, Gerace, & Smark, 2009). Only a few exceptions include samples with international coverage (Kwok & Reeb, 2000; Low & Chen, 2004). Among previous related literature, only Barton & Gordon (1988), Kochhar & Hitt (1998), Low & Chen (2004) and La Rocca, La Rocca, Gerace, & Smark (2009) investigate the effect of product diversification on corporate debt, while the remaining studies on this topic focus on international diversification strategies.

With respect to the effect of product diversification on capital structure, Barton & Gordon (1988) find that diversified firms in the United States have higher levels of debt because they face lower risk. In the same geographic context, Kochhar & Hitt (1998) find that equity financing is preferred for related diversification, while unrelated diversification is associated with debt financing. Along the same lines, Anderson, Bates, Bizjak, & Lemmon (2000) find that U.S. firms with multiple businesses present higher leverage ratios than specialized firms. However, these findings contrast with the evidence obtained by Jordan, Lowe, & Taylor (1998) for small- and medium-sized enterprises (SMEs) in the United Kingdom. These authors find that product diversification does not affect the capital structure of British SMEs.

Consistent with Jordan, Lowe, & Taylor (1998), Ngah-Kiing Lim, Das, & Das (2009) find that the main effects of related and unrelated diversification on debt financing levels are non-significant in firms based in Singapore. Although these empirical results contradict some findings from U.S. and Australian firms, they are consistent with Menéndez-Alonso (2003). This author concludes that there is no significant effect of diversification on firm capital structure using a sample of Spanish firms.

Focusing on Italian firms and based on the transaction cost theory, La Rocca, La Rocca, Gerace, & Smark (2009) show that, when firms adopt a related diversification strategy, they use less debt as a source of funding than unrelated diversified firms. Consistent with this result, they also find that firms that adopt an unrelated diversification

strategy present higher leverage than related diversified firms and even specialized firms. The higher indebtedness could be explained by lower cost of debt because of lower distress likelihood.

It is worth noting that, among the works previously discussed, only Kochhar & Hitt (1998), La Rocca, La Rocca, Gerace, & Smark, 2009, and Ngah-Kiing Lim, Das, & Das (2009) differentiate between related and unrelated diversification strategies. In this respect, La Rocca, La Rocca, Gerace, & Smark (2009) find a negative effect of related diversification on firm leverage, while unrelated diversification encourages the use of debt. These findings corroborate the importance of taking into account the type of diversification to reduce the risk of obtaining biased results.

The study by Low & Chen (2014) is among the first empirical works that examine the effect of product diversification on corporate leverage in an international context. Despite their reduced sample in terms of number of firms, they extend previous research to 34 countries. Low & Chen (2014) find that diversified firms are more leveraged than their specialized counterparts because diversification reduces the volatility of the cash flows used to honor the commitments associated with debt financing. As a consequence, it is possible to conclude that specialized firms have less indebtedness capacity. However, it is important to note that, despite their focus on product diversification strategies, they do not distinguish between related and unrelated diversification.

In this context, our objective is to investigate the effects of the different product diversification strategies (i.e., related and unrelated diversification) on firm capital structure. Compared to previous related literature, we go a step further by considering different corporate governance mechanisms, such as the type of ownership (i.e., family and non-family), the nature of the second largest shareholder (i.e., financial and non-financial) and the effect of managerial ownership, in the analyses. Specifically, we investigate how these governance characteristics moderate the impact of diversification strategies on corporate debt.

To achieve our goal, we use a broad international sample of European listed firms. The sample contains specialized and diversified companies, as well as family and non-family firms. Moreover, to reduce the risk of drawing biased conclusions, we use the panel data methodology in the estimation process because it allows us to control for the effect of

unobserved heterogeneity. This individual effect captures the motivations and preferences of managers, which are likely to vary with ownership structure (i.e., family and non-family), due to family owners' concerns over the preservation of their socioemotional wealth (SEW). Such motivations, which are unobservable to the researcher, are likely to be reflected in firm strategic decisions, including whether to diversify or not, as well as in firm financial decisions, such as the level of indebtedness. The panel data methodology also enables us to alleviate the omitted variable bias (Michaelas, Chittenden, & Poutziouris, 1999). This is an important advantage because manager-specific characteristics could partly explain corporate investment and financing decisions (Bertrand & Schoar, 2003).

Our empirical evidence suggests that diversification strategies adopted by firms influence their debt policies, but the effect depends on a firm's ownership and governance structures. On the one hand, related diversification affects debt negatively in non-family firms. However, this effect follows an inverted U-shape in family firms. On the other hand, the relation between unrelated diversification and leverage is nonlinear (inverted U-shape) for both types of firms. But the positive effect is stronger and the amount of debt obtained at the optimal level of diversification is higher in family firms. Our results also support that in family firms, regardless of how they diversify, the presence of a financial firm as the second largest shareholder and managerial ownership lead to stronger positive effect of diversification on firm leverage, thus increasing debt financing when diversification reaches its optimal level.

We contribute to the finance and strategic management literature in several ways. First, we account for and integrate corporate finance and strategic management research to gain a better understanding of how firm strategies affect financial decisions (La Rocca, La Rocca, Gerace, & Smark, 2009; Park & Jang, 2013; Staglianò, La Rocca, & La Rocca, 2014; de Andrés, de la Fuente, & Velasco, 2016; 2017). Second, we study the effect of related and unrelated diversification strategies separately to mitigate the risk of obtaining biased results (La Rocca, La Rocca, Gerace, & Smark, 2009). Our empirical approach represents an important step forward because previous studies traditionally do not differentiate between both types of diversification (Barton & Gordon, 1988; Jordan, Lowe, & Taylor, 1998; Anderson, Bates, Bizjak, & Lemmon, 2000; Menéndez-Alonso, 2003; Low & Chen, 2004).

Third, we extend the geographical coverage of prior related research, most of which is conducted on a single-country context (Barton & Gordon, 1988; Jordan, Lowe, & Taylor, 1998; Kochhar & Hitt, 1998; Anderson, Bates, Bizjak, & Lemmon, 2000; Menéndez-Alonso, 2003; La Rocca, La Rocca, Gerace, & Smark, 2009; Ngah-Kiing Lim, Das, & Das, 2009). It should be mentioned that, although Low & Chen (2014) use an international sample, they do not consider the difference between related and unrelated diversification strategies.

Fourth, we also consider the effect of ownership structure and other corporate governance mechanisms in the relation between diversification and the debt decision. Taking these dimensions into account is vital because a firm's ownership structure, which explains the type and severity of agency conflicts affecting firms, can shape the diversification and capital structure policies. Therefore, we improve on previous works that either do not consider such firm-level characteristics (Barton & Gordon, 1988; Jordan, Lowe, & Taylor, 1998; Kochhar & Hitt, 1998; Menéndez-Alonso, 2003; Ngah-Kiing Lim, Das, & Das, 2009), or just take some of them partly into account by, for example, incorporating the level of ownership concentration (but not the type of ownership) in the analyses (Anderson, Bates, Bizjak, & Lemmon, 2000; La Rocca, La Rocca, Gerace, & Smark, 2009).

Finally, the use of the panel data methodology enables us to control for unobserved heterogeneity, which is a problem that affects most specifications in the finance and management fields (Wintoki, Linck, & Netter, 2012; Flannery & Hankins, 2013; Pindado, Requejo, & de la Torre, 2015; Pindado, Requejo, & Rivera, 2017). We could obtain biased results if we did not take into consideration this econometrical problem. Accounting for unobserved heterogeneity is a noteworthy methodological contribution because there is always the risk of omitted variables. These variables, although not observable to researchers, may contain relevant information. By using panel data, the impact of these variables is captured by the individual effect, which is separated from the random component of the error term. Such effect is then removed in the estimation process, thus helping us to mitigate the risk of drawing biased conclusions.

The remainder of the study is organized as follows. Section 2 reviews previous literature concerning the possible theoretical approaches to explain the relation between

diversification and debt, and develops the testable hypotheses. The data, variables, and estimation method are described in Section 3. Sections 4 and 5 present the main analyses and the robustness tests, respectively. Section 6 summarizes the results of the study and concludes.

## 2. Theory and hypothesis development

As suggested by La Rocca, La Rocca, Gerace, & Smark (2009), the effect of the diversification strategy on capital structure should be analyzed from three different theoretical perspectives: (i) the coinsurance effect, (ii) the transaction cost theory, and (iii) the agency theory. According to the first approach, the coinsurance effect, diversification reduces operational risk because of the imperfect correlation among cash flows produced in the different industries in which the firm operates (Lewellen, 1971; Kim & McConnell 1977). Such beneficial effect is even stronger in firms that opt for unrelated diversification due to the smaller or even the lack of correlation among cash flows. Consequently, diversified firms are able to get higher levels of debt and, as a result, can take advantage of leverage tax shields (Bergh, 1997). In this regard, Hann, Ogneva, & Ozbas, (2013) find a lower cost of capital in diversified firms caused by a reduction in their systematic risk.

An additional explanation of how diversification strategies affect capital structure is provided by the transaction cost theory. This approach is based on the need to regulate the contractual relations between two parties (Williamson, 1988), and how debt and equity are corporate governance mechanisms to this aim (Markides & Williamson, 1996). Under this perspective, firm strategic decisions, such as the degree of diversification, depend on the specificity of assets (Chatterjee & Wernerfelt, 1991; Mahoney & Pandian, 1992). Firms with more specific assets will prefer a related diversification strategy because such assets can be more easily transferred across different businesses within the same company. Conversely, it will be easier to adopt an unrelated diversification strategy when firms' assets are non-specific since this type of asset could be used in different sectors (La Rocca, La Rocca, Gerace, & Smark, 2009).

The transaction cost approach also argues that firms finance non-specific assets (with higher liquidation value in case of default) using debt, while equity is the preferred

financing type to buy specific assets (characterized by lower liquidation value in case of default) (Williamson, 1988; Kochhar & Hitt, 1998).

Consequently, when firms adopt an unrelated diversification strategy, their capacity to honor interest payments increases and they can obtain higher levels of debt. As a result, an unrelated diversification strategy facilitates the access to debt markets. In addition, internal capital markets also enable better access to debt because non-specific resources can be used in the different sectors in which the company operates, thus helping firms to reach their target debt levels (La Rocca, La Rocca, Gerace, & Smark, 2009).

The third theoretical approach that allows us to understand the effect of diversification strategies on firm leverage is the agency theory. Conflicts of interests between managers and shareholders are at the center of this theory (Jensen & Meckling, 1976). In this regard, Jensen (1986) presents corporate debt as a mechanism to reduce managerial discretion over free cash flows and, therefore, as a mechanism to discipline managers. Debt reduces the ability of mangers to make those diversification decisions that are exclusively motivated by their own personal interests (e.g., unrelated diversification), thus benefitting shareholders (Jensen, 1986).

However, it is not completely clear how diversification can affect debt decisions. On the one hand, shareholders could prefer higher leverage with increased diversification to discipline the managerial team. On the other hand, once the firm has adopted an unrelated diversification strategy, managers may avoid debt level increases because higher leverage will reduce their ability to decide how to invest free cash flows. According to Jandik & Makhija (2005), diversification creates an agency problem because in general managers tend to withhold free cash flows and diversification offers new overinvestment opportunities for these resources. As a consequence, lower levels of debt could increase overinvestment problems (Li & Li, 1996) and, therefore, diversified firms could benefit from the use of debt in terms of higher market value (Kaplan & Weisbach, 1992; Li & Li, 1996; Singh, Davidson, & Suchard, 2003). Nonetheless, it should also be noted that diversification could increase agency problems by making the manager indispensable to the company (Shleifer & Vishny, 1989; Aggarwal & Samwick, 2003).

In addition to the ideas previously discussed, it is necessary to differentiate between the types of diversification and to account for firm ownership structure to disentangle the

relation between diversification and corporate leverage. Concerning ownership structures, we must distinguish between family and non-family firms because each of them has its own agency problems that lead to different preferences when it comes to diversification strategies (Gómez-Mejía, Makri, & Larraza-Kintana, 2010) and debt policies.

*2.1. The role of ownership structure in the diversification–debt relation*

The identity of a firm's main shareholder determines to a great extent corporate financial choices. There is previous empirical evidence on how corporate governance mechanisms not only reduce agency problems but also shape capital structure (Florackis & Ozkan, 2009; Setia-Atmaja, Tanewski, & Skully, 2009; Pindado, Requejo, & de la Torre, 2015). This more recent strand of research complements previous efforts to disentangle the traditional determinants of leverage (Miguel & Pindado, 2001; Frank & Goyal, 2009).

Ownership structure also influences firm strategic decisions, such as whether to diversify or not, and how to do it. Although diversification strategies and how they depend on corporate ownership structure are an issue that has attracted and continues to attract scholars' and practitioners' attention, there is still no consensus on how they relate to each other. On the one hand, Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes (2007), who review and analyze finance, accounting and management studies on family firms, reveal that overall family control is associated with risk aversion. Shleifer & Vishny (1997), Faccio, Lang, & Young (2001), and Anderson & Reeb (2003b), among others, argue that family firms have a strong incentive to minimize firm risk given the undiversified nature of family owners' portfolio. From this perspective, and considering that family wealth is primarily concentrated within a single organization, corporate diversification offers family firms an opportunity to mitigate firm risk (Schulze, Lubatkin, & Dino, 2003a; Zahra, 2012). The diversification strategy reduces volatility in earnings by providing greater financial security to the family (Faccio, Lang, & Young, 2001) and improving the probability of firm survival. This is indeed a vital concern for family members, whose welfare and that of their descendants is inextricably tied to the future of a single organization (Casson, 1999).

On the other hand, there is also evidence that family firms diversify less than non-family firms (Gómez-Mejía, Makri, & Larraza-Kintana, 2010). The main reason that

explains this pattern is the desire to maintain the degree of familiness stemming from a strong personal attachment, commitment, and identification with the firm (Habbershon & Williams, 1999; Thomsen & Pedersen, 2000; Anderson & Reeb, 2003b). In this regard, Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes (2007) contend that the ability to exercise authority, the enjoyment of personal control, the sense of belonging, affection, and intimacy, as well as the active role of the family dynasty form a socioemotional endowment that many family firms believe should be preserved and maintained. According to these authors, the dimensions previously mentioned can be grouped into a broad construct (the so-called SEW) that encompasses a variety of non-financial aspects of the business that meet the family's emotional needs and is the reference point for family firms.

In line with the family control argument presented above, Gómez-Mejía, Makri, & Larraza-Kintana (2010) also suggest that family firms may diversify less than non-family firms because diversification requires raising additional capital by taking on more debt. Since family firms are more reluctant than non-family firms to losing control of the business and, taking into account that higher debt levels increase the risk of financial distress and the loss of family control, then family firms should be less willing to take on the additional debt needed to diversify and, as a consequence, they will diversify less (Schulze, Lubatkin, & Dino, 2003a).

Another explanation to expect lower degree of diversification in family firms is that this strategy requires expertise and resources that are external to the firm (McConaughy, 2000; Schulze, Lubatkin, & Dino, 2003b). And family firms are less likely to incorporate outsiders' perspectives and opinions in their decision-making processes because such approach would imply a potential loss of control (Schulze, Lubatkin, Dino, & Buchholtz, 2001; Schulze, Lubatkin, & Dino, 2003b). Family firms could even reject growth opportunities if they cannot fund them with their own internal resources (Koropp, Grichnik, & Kellermanns, 2013).

*2.2. Accounting for the type of diversification: Related versus unrelated diversification strategies*

It is generally accepted that the degree of intangibles as a fraction of firm total assets is negatively related to leverage (Singh, Davidson, & Suchard, 2003) because tangible assets are frequently used as collateral to obtain debt. Based on this idea, it is important to analyze separately the different type of diversification strategies (related versus unrelated) implemented by firms. Note that the preferred diversification type might have a direct impact on the amount of intangibles assets and therefore on the indebtedness decision of the firm. Consequently, we are compelled to examine related and unrelated diversification separately (La Rocca, La Rocca, Gerace, & Smark, 2009) to identify more clearly the implications of the diversification strategy. As previous literature recognizes, investigating product diversification without taking into account the degree of relatedness is one of the drawbacks of previously related works (e.g., Singh, Davidson, & Suchard, 2003; Low & Chen, 2004).

*2.2.1. The related diversification strategy*

From the coinsurance effect perspective, diversified firms are less risky and, therefore, are more prone to finance their projects using debt (Ngah-Kiing Lim, Das, & Das, 2009). However, the expected positive effect of diversification on debt could be weaker if we refer to related diversification. This type of diversification strategy requires sharing activities and transferring skills across businesses to increase firm value from operational synergies. Funds obtained from banks and corporate bond markets can be used to facilitate operations across units, build interdependencies, and generate synergies across businesses to create value. As managers focus on achieving operational synergies and cost savings, debt holders may be more willing to lend money to the firm and may be less likely to scrutinize and interfere in firm operations (Ngah-Kiing Lim, Das, & Das, 2009).

As a consequence, to confirm this expected positive link between related diversification and debt, firms need strong corporate governance mechanisms that facilitate monitoring and reduce the risk of overinvestment in the diversification process, which would lead to poor financial performance (Hitt, Tihanyi, Miller, & Connelly, 2006; Wan, Hoskisson, Short, & Yiu, 2011). Focusing on the family versus non-family ownership

dichotomy and considering that traditional owner–manager agency conflicts are more pronounced in non-family firms (Anderson & Reeb, 2003; Villalonga & Amit, 2006), the positive effect of related diversification on corporate leverage is less likely to apply to non-family firms.

In addition, the transaction cost theory suggests that related diversification and debt could be negatively associated with each other. Note that related diversification strategies are traditionally based on specific assets, whose value as collateral is lower for borrowers. As a consequence, firms with this type of assets may face difficulties to get debt (Williamson, 1988; Kochhar & Hitt, 1998).

Finally, 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 the company (Miguel, Pindado, & de la Torre, 2005; D'Mello & Miranda, 2010). In this regard, in companies with dispersed ownership and atomistic shareholders, managers might prefer to assure their control over decision making by avoiding additional leverage, which would jeopardize their ability to manage firm free cash flows in a discretionary way. Considering these arguments, we propose the following hypothesis:

**H1a:** Related diversification has a negative effect on non-family firms' leverage.

Although firms that adopt a related diversification strategy usually have lower levels of corporate debt, as we have just argued, recent research shows that in general family firms exhibit higher indebtedness levels (King & Santor, 2008; Setia-Atmaja, Tanewski, & Skully, 2009; Croci, Doukas, & Gonenc, 2011; Pindado, Requejo, & Rivera, 2017). The main reason for family firms' higher debt levels is family owners' concerns over the preservation of family control. In order to assure that the business continues to be in the hands of the family and to avoid dilution of family control (Keasey, Martínez, & Pindado, 2015), family firms prefer to raise new debt rather than issuing equity.

In addition, family firms usually have better corporate disclosure practices (Wang, 2006; Ali, Chen, & Radhakrishnan, 2007), which contributes to reduce information

asymmetries between internal and external stakeholders. In line with the trade-off theory of capital structure, higher transparency should facilitate access to new debt.

Consequently, recognizing family owners' preferences for debt financing, we expect that increasing the degree of related diversification allows family firms to increase their leverage. However, when related diversification exceeds the optimal level, the arguments from the transaction cost theory that propose a negative relation between diversification and leverage will prevail, thus leading to a negative effect. In this respect, our next hypothesis is in line with Singh, Davidson, & Suchard (2003), who contend that product diversification and firm debt could be non-linearly related. In particular, we expect that:

**H1b:** Related diversification affects family firms' debt positively, but discourages the use of debt when the degree of diversification exceeds the optimal level.

*2.2.2. The unrelated diversification strategy*

Unlike firms that opt for related diversification, companies that prefer unrelated diversification are able to reduce the risk to which they are exposed. Consequently, the coinsurance effect is more pronounced in this strategy, thus improving firm capacity to increase debt compared with firms that implement a related diversification strategy.

Another reason to expect a positive effect of unrelated diversification on firm leverage is that this type of diversification helps companies to achieve their target debt level (La Rocca, La Rocca, Gerace, & Smark, 2009). Unrelated diversification allows firms to raise debt more easily, faster and with lower transaction costs because firms could reallocate resources within their internal capital markets. Indeed, adopting an unrelated diversification strategy reduces firm dependence on costly external financing (Staglianò, La Rocca, & La Rocca, 2014). As a consequence, the transaction cost approach predicts higher debt with unrelated diversification, also due to the better and more valuable collateral (i.e., non-specific assets) associated with this strategy.

However, there are also reasons that support a negative effect of unrelated diversification on corporate debt. Banks and bond markets might be less willing to lend funds to firms that follow this strategy, especially if they believe their investment is not properly safeguarded (Kochhar, 1996). Problems like overinvestment and the need of

additional external skills to efficiently manage resources that are used in different sectors increase agency problems. This pattern is particularly pronounced in firms where the separation of management from ownership creates incentives for managers to avoid control mechanisms, such as corporate debt. In this respect, previous empirical evidence shows that debt alleviates the potential negative effect of unrelated diversification on firm performance (Park & Jang, 2013). These arguments allow us to hypothesize that:

**H2a:** Unrelated diversification has a positive effect on non-family firms' leverage, as long as the degree of diversification does not exceed the optimal level, whereas agency conflicts discourage firm indebtedness beyond the inflection point.

We argue that unrelated diversification and firm indebtedness are non-linearly related and the relation between the two follows an inverted U-shape. However, we expect a stronger positive effect of this strategy on family firms' debt in the interval where the relation is positive. The main reason is the higher preference for debt over equity when a family controls the company. Additionally, lenders will prefer that companies adopt an unrelated diversification strategy when a family is in control because the alignment of interests between managers and shareholders and the long-term orientation of family firms might reduce the risk of overinvestment (Zellweger, 2007). As a result, the optimal level of unrelated diversification at which firm debt is maximized should be higher in family than in non-family firms. Therefore, we expect that:

**H2b:** The positive effect of unrelated diversification on debt when the degree of diversification does not exceed the optimal level is stronger in family firms, thus leading to a higher optimal level of unrelated diversification in family than in non-family firms.

*2.3. Heterogeneity in firm control mechanisms*

Although in early family business literature it was common to consider family firms as a homogenous group that was compared with non-family firms, more recent studies recognize that family firms are heterogeneous (Chrisman, Chua, & Sharma, 2005; Kellermanns, Eddleston, Sarathy, & Murphy, 2012; Kraiczy, Hack, & Kellermanns, 2014).

Consequently, it is necessary to take into account differences within the family business category to obtain more fine-grained results.

It is generally accepted that family firms experience less agency problems, at least between managers and shareholders (Chrisman, Chua, & Litz, 2004). However, this type of ownership structure might create conflicts of interests between members of the controlling family and minority shareholders (Sacristán-Navarro, Gómez-Ansón, & Cabeza-García, 2011; Schulze, Lubatkin, & Dino, 2003b). This new agency conflict is likely to impact on firm strategic decisions, such as diversification policies. As a consequence, we now focus on two governance dimensions that differentiate family firms from each other and that might play a role in shaping family firms' preferences when it comes to strategic policies and financial decisions. The two dimensions considered are: (i) the nature of the second largest shareholder and (ii) the presence of a manager shareholder with managerial responsibilities and a stake in the business.

*2.3.1. The nature of the second largest shareholder*

While it is true that agency problems caused by the separation between ownership and management are less severe in family firms, concentrated ownership and the predominance of family control imply greater concerns over conflicts of interests between dominant shareholders and minority outside investors (Burkart, Panunzi, & Shleifer, 2003; Andres, Betzer, Bongard, Haesner, & Theissen, 2013). The main reason for this more recent agency problem is that the family—as a homogeneous group of individuals who know each other well and share the same values—can easily coordinate and make decisions that are detrimental to the interests of minority shareholders (Villalonga & Amit, 2006; Lins, Volpin, & Wagner, 2013).

However, some internal governance mechanisms can mitigate the potential drawbacks of family ownership. For instance, when a financial company owns a significant fraction of the family business, the conflict between majority and minority shareholders can be alleviated. The intuition behind this idea is that the presence of such financial institutions in the board of directors could promote long-term investments that family firms may otherwise reject due to their risky nature to preserve their SEW (Sanchez-Bueno & Usero, 2014). Family firms could also benefit from the presence of a financial institution

within their shareholder base because these firms monitor managers more closely, provide capital as debt and equity (Lee & O'neill, 2003), and bring an external perspective into the board so important to encourage diversification (Sanchez-Bueno & Usero, 2014).

Moreover, the nature of the second largest shareholder plays a vital role when firms define their capital structure. The presence of a financial institution among the largest shareholders minimizes the expropriation risk perceived by debtholders because it can hinder possible collusion between the controlling family and other large family investors (Maury & Pajuste, 2005; Pindado, Requejo, & de la Torre, 2011). As a result, potential creditors are likely to be less concerned and may be more willing to provide funds. Agency conflicts between the controlling owner and debtholders in this type of family firm (i.e., those in which the second largest shareholder is a financial company) will be less severe due to the lower risk that funds are diverted for private gains.

Considering the positive effects for family firms of having a financial firm as the second largest shareholder, we expect that, regardless of the diversification strategy adopted (i.e., related or unrelated), the positive effect of diversification on corporate leverage is more pronounced when a financial institution performs a monitoring role. As a consequence, the optimal level of diversification up to which the effect on debt is positive moves further to the right. In other words, we expect that:

**H3a:** The effect of related diversification on debt is non-linear (inverted U-shape) and, in the first interval (when the relation is positive), the impact is stronger in family firms with a financial company as the second largest shareholder (compared to other family firms).

**H3b:** The effect of unrelated diversification on debt is non-linear (inverted U-shape) and, in the first interval (when the relation is positive), the impact is stronger in family firms with a financial company as the second largest shareholder (compared to other family firms).

*2.3.2. Presence of the family in management positions*

Family firms in which the largest shareholder holds a managerial position deserve special attention. From an agency perspective, this group of firms is particularly interesting because the closer involvement of the controlling family in the business contributes to

minimize the traditional owner–manager agency conflict (Maury, 2006; Block, 2012). However, at the same time agency problems related with wealth expropriation of minority shareholders could be more pronounced in this type of company (Yoshikawa & Rasheed, 2010; Le Breton-Miller, Miller, & Lester, 2011).

Active participation of family members in the management of the firm may have positive effects on firm performance. Indeed, Anderson & Reeb (2003a) and Maury (2006) conclude that, when the controlling family has managerial positions in the business, family firms perform better than non-family firms. Closer involvement of the family in business management can also be considered as a sign of long-term commitment of the family to the firm (Pindado, Requejo, & de la Torre, 2015), which could be positively assessed by debtholders.

However, the presence of family shareholders in the top management team could hinder the implementation of diversification strategies, especially unrelated diversification. When the family controls managerial positions, non-family members' external perspectives and knowledge may be underrepresented and even lacking. This lack of resources could be an obstacle to higher diversification of the firm's product portfolio (Kraiczy, Hack, & Kellermanns, 2014). Nonetheless, despite lower levels of diversification, overinvestment problems could be less pronounced in these companies and new businesses started are likely to be carefully scrutinized because not only family's wealth but also the job of family members depend on the success of the company (Pindado, Requejo, & de la Torre, 2015).

Family firms managed by a family shareholder can gain better access to debt financing and at lower cost (Anderson, Mansi, & Reeb, 2003). The reason is that asymmetric information problems between owners and creditors can be mitigated if the owner family not only keeps a significant stake in the company, but is also represented in the management team (Anderson, Mansi, & Reeb, 2003; Pindado, Requejo, & de la Torre, 2015). Therefore, when the controlling family occupies managerial positions, problems derived from information asymmetries are alleviated (Wang, 2006; Ali, Chen, & Radhakrishnan, 2007) and access to debt is facilitated.

Another reason to contend that a family firm in which the manager is also a shareholder could have easier access to debt financing is the long-term orientation and the desire to preserve family reputation in this type of company. Such situation encourages

alignment of interests between shareholders and debtholders. The use of personal wealth (including SEW) as collateral is more likely when the family is involved in ownership and management, which reinforces family's intentions to comply with debt commitments. Creditors may interpret this as a sign of trust between the two parties (Pindado, Requejo, & de la Torre, 2015).

Considering the previous discussion about family firms managed by a family shareholder (i.e., the fewer but more carefully scrutinized diversification decisions and the easier access to debt financing in this type of family firm), we expect that, regardless of the diversification strategy (related or unrelated), the positive effect of diversification on corporate leverage is more pronounced in this type of company. Consequently, the optimal level beyond which excess diversification discourages the use of debt moves further to the right. Consistent with this argument, we propose that:

**H4a:** The effect of related diversification on debt is non-linear (inverted U-shape) and, in the first interval (when the relation is positive), the impact is stronger in family firms managed by the controlling family (compared to family firms with an external manager).

**H4b:** The effect of unrelated diversification on debt is non-linear (inverted U-shape) and, in the first interval (when the relation is positive), the impact is stronger in family firms managed by the controlling family (compared to family firms with an external manager).

## 3. Data, variables, and estimation method

### *3.1. Data sources and sample*

To test the hypotheses proposed in the previous section, we need two types of information (firm- and country-specific), which we obtain from three different sources. First, we use firms' financial statements to calculate the dependent variable and some of the control variables that refer to firm characteristics. We obtain this information from the Worldscope database. Second, we rely on the Amadeus database, which is provided by Bureau van Dijk (BvD) to classify firms based on their ownership structure and internal governance mechanisms. Finally, historical GDP (gross domestic product) and historical inflation rates of each country, which are used to compute some control variables, are

obtained from the website of the World Bank. Table 1 presents variable definitions and data sources used to calculate them.

[Insert Table 1 about here]

The years considered in the analyses span from 1998 until 2013. However, it should be noted that we lose the initial year because the explanatory variables of interest are lagged in the empirical specifications, as we highlight in the following section. Table 2 contains the distribution of the sample by year.

[Insert Table 2 about here]

The final sample contains 1,902 listed companies (16,653 firm-year observations), including 546 family firms (4,650 firm-year observations) and covers years 1999–2013 and 18 European countries. We only consider companies for which we get at least five consecutive years of data. This requirement is necessary to test for the absence of second-order serial correlation because our estimation method, the generalized method of moments (GMM), is based on this assumption. We exclude financial, insurance, and utilities sectors (two-digit SIC codes 49 and 60). Following Duchin (2010), we exclude financial firms and utilities, but do not exclude industrial firms with businesses in the financial sector because excluding these companies would eliminate from the sample many large conglomerates that maintain a finance division. Table 3 contains the distribution of the sample by country.

[Insert Table 3 about here]

*3.2. Empirical specification*

We estimate a partial adjustment model of debt that follows the specification proposed by Flannery & Rangan (2006), Öztekin & Flannery (2012), Keasey, Martinez, & Pindado (2015), and Pindado, Requejo, & Rivera (2017), among others. We can define the general partial adjustment model as:

$$LEV_{it} - LEV_{i,t-1} = \lambda\left(LEV_{it}^{*} - LEV_{i,t-1}\right) + \varepsilon_{it}, \quad (1)$$

where $LEV_{it}$ is the total debt of the company *i* at the end of year *t* (Singh, Davidson, & Suchard, 2003). While book values are often the focus of credit financing decisions (Chava & Roberts, 2008) since assets in place support more debt capacity than future investment

opportunities (Myers, 1977), market values are more economically meaningful for some firms (Welch, 2004). Therefore, in the main analyses, we use the book value of total debt, while in the robustness tests we estimate the models using the market value of total debt.

$LEV_{it}^{*}$ is the target value of total debt of firm *i* at the end of year *t*; $\lambda$ is the speed of adjustment of leverage to the firm's desired level; and $\varepsilon_{it}$ is the error term. Following previous literature (Flannery & Rangan, 2006; Frank & Goyal, 2009; Korajczyk & Levy, 2003; Levy & Hennessy, 2007; Öztekin & Flannery, 2012; Rajan & Zingales, 1995), we define firms' target debt as a function of its most widely accepted determinants:

$$LEV_{it}^{*} = \alpha_0 + \alpha_D DIV_{i,t-1} + \alpha_F F_{i,t-1} + \alpha_C C_{j,t-1} + \alpha_N N_j + \alpha_T T_t + \eta_i + \upsilon_{it}, \quad (2)$$

where $DIV_{i,t-1}$ is the set of variables related with diversification and corporate ownership structure, while $F_{i,t-1}$ and $C_{j,t-1}$ include firm-specific and country-specific determinants of target debt, which are defined below. Two types of dummy variables are also included in Equation (2). $N_j$ and $T_t$ enable us to control for country-specific and time-specific effects, respectively. There are differences unobservable to the researcher between family and non-family firms related with their culture and values, which lead to variations in the importance given to the preservation of SEW across firms. We control for this unobserved heterogeneity, which can be assumed constant over time, with the individual effect, $\eta_i$. Finally, $\upsilon_{it}$ is the random disturbance.

The empirical specification that enables us to test our hypotheses is detailed in Equation (3). This equation is the result of substituting the determinants of target leverage, Equation (2), in the partial adjustment model of debt, Equation (1), and subsequently rearranging terms:

$$LEV_{it} = \lambda\alpha_0 + (1-\lambda)LEV_{i,t-1} + (\lambda\alpha_D)DIV_{i,t-1} + (\lambda\alpha_F)F_{i,t-1} + (\lambda\alpha_C)C_{j,t-1} + (\lambda\alpha_N)N_j + (\lambda\alpha_T)T_t + \lambda\eta_i + \upsilon_{it}. \quad (3)$$

The $\lambda$ coefficient in Equation (3) should comply with the condition that $0<\lambda<1$. Moreover, for a clearer interpretation, we simplify the notation used for the coefficients of the models developed to test the hypotheses as follows:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + \beta_D DIV_{i,t-1} + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}. \quad (4)$$

The set of firm-specific explanatory variables related with diversification, $DIV_{i,t-1}$, comprises the level of diversification (related or unrelated depending on the hypothesis) and its square, dummy variables that capture a specific corporate governance characteristic and the interaction between the two (i.e., diversification and dummy variables). In particular, we replace the $DIV_{i,t-1}$ variable with the measure of related (Hypotheses 1, 3a and 4a) or unrelated diversification (Hypotheses 2, 3b and 4b). $RELDIV_{i,t-1}$ ($UNRELDIV_{i,t-1}$) is the entropy index of sales, based on four-digit (two-digit) SIC codes, which captures the degree of related (unrelated) diversification of the firm (Hoskisson, Hitt, Johnson, & Moesel, 1993; Hitt, Hoskisson, & Kim, 1997; Wiersema & Bowen, 2008; Ngah-Kiing Lim, Das, & Das, 2009; Gómez-Mejía, Makri, & Larraza-Kintana, 2010; Muñoz-Bullón & Sánchez-Bueno, 2012; Kistruck, Qureshi, & Beamish, 2013; Galván, Pindado, & de la Torre, 2014; Sanchez-Bueno & Usero, 2014). $RELDIV_{i,t-1}$ ($UNRELDIV_{i,t-1}$) takes the value of zero for specialized firms, while higher values indicate higher degree of diversification.

Among the variables of interest, we include a dummy variable, $DUMMY\_G_i$, which captures the effect of a specific corporate governance characteristic, depending on the hypothesis to be tested. To test Hypotheses 1 and 2, we replace the $DUMMY\_G_i$ with $DUMFAM_i$, which equals one for family firms, and zero otherwise. In line with previous literature (La Porta, Lopez-de-Silanes, & Shleifer, 1999; Claessens, Djankov, & Lang, 2000; Faccio & Lang, 2002; Maury, 2006; Dahya, Dimitrov, & McConnell, 2008; Laeven & Levine, 2008; Gonenc, Hermes, & van Sinderen, 2013), we identify the ultimate owner to define family control. Following Franks, Mayer, Volpin, & Wagner (2012) and Lins, Volpin, & Wagner (2013), who also use BvD databases for their empirical analyses, we use a 25% control threshold to identify a firm's ultimate owner. Consequently, a firm is classified as family owned when its ultimate owner at the 25% control threshold is an individual or family. We should clarify that, although this dummy refers to one time period (as in Pindado, Requejo, & de la Torre, 2015), this is not a serious limitation because we only use this dummy to classify firms according to their governance characteristics.

Moreover, as previous studies recognize (see, e.g., La Porta, Lopez-de-Silanes, & Shleifer, 1999; Zhou, 2001), the ownership structure of corporations tends to be relatively stable over time and typically changes slowly from year to year within a company.

To test Hypotheses 3 and 4, which focus on the heterogeneous nature of family firms regarding their governance structures, we only consider the subsample of family firms. On the one hand, for Hypothesis 3, we replace $DUMMY\_G_i$ with $DUMBANK_i$, which takes the value of one if the second largest shareholder is a financial company, and zero otherwise. On the other hand, for Hypothesis 4, we replace $DUMMY\_G_i$ with $DUMSHMAN_i$, which takes the value of one if the firm's ultimate owner is also a manager, and zero otherwise.

Therefore, if we specify the set of variables related with diversification and the corresponding interactions in Equation (4), $DIV_{i,t-1}$, we obtain the empirical specifications that enable us to test our hypotheses:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + \beta_1 DIV_{i,t-1} + \gamma_H DUMMY\_G_i DIV_{i,t-1} + \beta_2 DIV_i^2 + \gamma_H DUMMY\_G_i DIV_{i,t-1}^2 + \beta_3 DUMMY\_G_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}. \quad (5)$$

Before explaining the sets of control variables ($F_{i,t-1}$ and $C_{j,t-1}$) considered in the regression analyses, we rearrange the variables of interest and also simplify the coefficients' notation as in Equation (6):

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_H DUMMY\_G_i)DIV_{i,t-1} + (\beta_2 + \gamma_H DUMMY\_G_i)DIV_{i,t-1}^2 + \beta_3 DUMMY\_G_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}. \quad (6)$$

The remaining variables included in the right-hand side of all empirical specifications are firm- and country-level characteristics that have been shown to be important determinants of corporate debt. Among the firm-specific variables ($F_{i,t-1}$), we consider profitability ($PROFIT_{i,t-1}$), measured as the ratio of the operating income before depreciations and amortizations to total assets (Frank & Goyal, 2009); the market-to-book

ratio ($MTB_{i,t-1}$), which is a proxy for the future growth opportunities of the company (Öztekin & Flannery, 2012); the tax shield due to interests deductibility ($TAXES_{i,t-1}$), measured as the current income taxes over income before income taxes (Öztekin & Flannery, 2012); the need for interest deductions provided by debt financing ($DEPAMTA_{i,t-1}$), measured as the depreciation and amortization expenses over total assets (Öztekin & Flannery, 2012); firm size ($SIZE_{i,t-1}$), measured as the logarithm of total assets (Öztekin & Flannery, 2012); the level of assets' tangibility ($TANG_{i,t-1}$), measured as fixed assets over total assets (Frank & Goyal, 2009; Öztekin & Flannery, 2012; Rajan & Zingales, 1995); the industry leverage ($INDLEV_{i,t-1}$), measured as the mean of the leverage of the sector using two-digit SIC codes (Öztekin & Flannery, 2012); liquidity ($LIQ_{i,t-1}$), measured as short-term assets over short-term liabilities (Öztekin & Flannery, 2012); and the asset turnover ratio ($AT_{i,t-1}$), measured as revenues over total assets (Singh, Davidson, & Suchard, 2003; Pindado, Requejo, & la Torre, 2015).

Following previous literature on the determinants of corporate capital structure (Öztekin & Flannery, 2012), the set of country-specific variables that affect firm leverage ($C_{j,t-1}$) comprises the annual inflation rate ($INFLATION_{j,t-1}$), and the annual growth in nominal gross domestic product ($GDPGROWTH_{j,t-1}$). Table 4 reports the main descriptive statistics of all variables considered in the analyses.

[Insert Table 4 about here]

To test Hypothesis 1, we substitute $DUMFAM_i$ for $DUMMY\_G_i$, and $RELDIV_{i,t-1}$ for $DIV_{i,t-1}$ in Equation (6). For Hypothesis 2, we also use the $DUMFAM_i$ variable but replace $DIV_{i,t-1}$ with $UNRELDIV_{i,t-1}$. Meanwhile, to test Hypothesis 3, $DUMMY\_G_i$ is replaced with $DUMBANK_i$ and $DIV_{i,t-1}$ is replaced with either $RELDIV_{i,t-1}$ or $UNRELDIV_{i,t-1}$ in Equation (6), depending on whether we are testing Hypothesis 3a or 3b. Finally, to check our last hypotheses, we substitute $DUMSHMAN_i$ for $DUMMY\_G_i$ and replace $DIV_{i,t-1}$ with $RELDIV_{i,t-1}$ (to test Hypothesis 4a) and with $UNRELDIV_{i,t-1}$ (to test Hypothesis 4b).

With respect to Hypothesis 1, the moderating effect of family ownership on the relation between firm leverage and firm related diversification is measured with the interaction terms $DUMFAM_i RELDIV_{i,t-1}$ and $DUMFAM_i RELDIV_{i,t-1}^2$. Now, two cases should be considered. First, for non-family firms, the effect of related diversification on

debt is captured by $\beta_1$ and $\beta_2$ (given that $DUMFAM_i$ = 0). Second, for family firms, the impact is evaluated by $(\beta_1 + \gamma_1)$ and $(\beta_2 + \gamma_2)$ (given that $DUMFAM_i$ = 1). Therefore, in line with Hypothesis 1a, a negative effect of related diversification on debt should be confirmed. In other words, we expect $\hat{\beta}_1 < 0$ and $\hat{\beta}_2 = 0$. Moreover, to find support for Hypothesis 1b, empirical results should support a non-linear relation (inverted U-shape) between diversification and leverage. That is, we expect that $\hat{\beta}_1 + \hat{\gamma}_1 > 0$ and $\hat{\beta}_2 + \hat{\gamma}_2 < 0$.

To test Hypothesis 2, we use a similar approach but focus on unrelated rather than related diversification. Now the interaction terms of interest are $DUMFAM_i UNRELDIV_{i,t-1}$ and $DUMFAM_i UNRELDIV^2_{i,t-1}$, which capture how family ownership moderates the effect of unrelated diversification on corporate debt. On the one hand, for non-family firms, the effect of unrelated diversification on firm debt is $\beta_1$ and $\beta_2$ (given that $DUMFAM_i$ = 0). On the other hand, for family firms, the effect of the unrelated diversification strategy on leverage is $(\beta_1 + \gamma_3)$ and $(\beta_2 + \gamma_4)$, (given that $DUMFAM_i$ = 1). Therefore, consistent with Hypothesis 2a, we expect $\hat{\beta}_1 > 0$ and $\hat{\beta}_2 < 0$.

Regarding Hypothesis 2b, empirical evidence needs to comply with two conditions to be confirmed. The first condition refers to the non-linear relation. That is, we expect that $\hat{\beta}_1 + \hat{\gamma}_3 > 0$ and $\hat{\beta}_2 + \hat{\gamma}_4 < 0$. The second condition is related with the intensity of the effects, which in turn influences the inflection point at which increases in the degree of unrelated diversification start to discourage the use of debt. In this regard, we expect that $-(\hat{\beta}_1)/2(\hat{\beta}_2)$ [1] $< -(\hat{\beta}_1 + \hat{\gamma}_3)/2(\hat{\beta}_2 + \hat{\gamma}_4)$ [2] to support that the optimal level of unrelated diversification at which the effect of diversification on debt turns from positive into negative is higher in family than in non-family firms, as proposed in Hypothesis 2b.

In relation to Hypotheses 3a (3b), we make the necessary adjustments in Equation (6) and focus on the interaction terms $DUMBANK_i RELDIV_{i,t-1}$ and $DUMBANK_i RELDIV^2_{i,t-1}$

[1] To obtain the inflection point, it is necessary to compute the first order derivative of leverage with respect to the diversification strategy variable using Equation (5) and then equal to zero: that is, $\frac{dLEV_{it}}{dDIV_{i,t-1}} = \hat{\beta}_1 + 2\hat{\beta}_2 DIV_{i,t-1} = 0$, which implies that the optimal level of diversification at which leverage is maximized (in non-family firms) is: $DIV_{i,t-1} = -\hat{\beta}_1/2\hat{\beta}_2$.

[2] To obtain the inflection point when the corporate governance-specific dummy variable equals one, it is necessary to compute the first order derivative of leverage with respect to the diversification strategy variable using Equation (5) and then equal to zero: that is, $\frac{dLEV_{it}}{dDIV_{i,t-1}} = (\hat{\beta}_1 + \hat{\gamma}_H) + 2(\hat{\beta}_2 + \hat{\gamma}_H) DIV_{i,t-1} = 0$, which implies that the optimal level of diversification at which leverage is maximized (in the corresponding firm category, such as family firms in general) is: $DIV_{i,t-1} = -(\hat{\beta}_1 + \hat{\gamma}_H)/2(\hat{\beta}_2 + \hat{\gamma}_H)$.

($DUMBANK_i UNRELDIV_{i,t-1}$ and $DUMBANK_i UNRELDIV^2_{i,t-1}$). These terms capture how having a financial company as the second largest shareholder moderates the effect of related (unrelated) diversification on corporate debt. On the one hand, for family firms with a second largest shareholder that is not a financial institution, the effect of related (unrelated) diversification on firm debt is captured by $\beta_1$ and $\beta_2$ (given that $DUMBANK_i$ = 0). On the other hand, in family firms in which the second largest shareholder is a financial company, the effect of the related (unrelated) diversification strategy on leverage is $(\beta_1 + \gamma_5)$ and $(\beta_2 + \gamma_6)$ ($(\beta_1 + \gamma_7)$ and $(\beta_2 + \gamma_8)$) (given that $DUMBANK_i$ = 1). Consequently, we first expect that $\hat{\beta}_1 + \hat{\gamma}_5 > 0$ and $\hat{\beta}_2 + \hat{\gamma}_6 < 0$ ($\hat{\beta}_1 + \hat{\gamma}_7 > 0$ and $\hat{\beta}_2 + \hat{\gamma}_8 < 0$) to find support for a non-linear (inverted U-shape) relation between related (unrelated) diversification and firm debt regardless of the identity of the second largest shareholder. Second, to confirm that the optimal level of related (unrelated) diversification (in terms of maximizing corporate leverage) is higher in family firms with a financial institution as the second largest shareholder, we should also find that $-(\hat{\beta}_1)/2(\hat{\beta}_2) < -(\hat{\beta}_1 + \hat{\gamma}_5)/2(\hat{\beta}_2 + \hat{\gamma}_6)$ ($-(\hat{\beta}_1)/2(\hat{\beta}_2) < -(\hat{\beta}_1 + \hat{\gamma}_7)/2(\hat{\beta}_2 + \hat{\gamma}_8)$), which would support Hypothesis 3a (3b).

Finally, to test Hypothesis 4a (4b), we include in Equation (6) the interaction terms $DUMSHMAN_i RELDIV_{i,t-1}$ and $DUMSHMAN_i RELDIV^2_{i,t-1}$ ($DUMSHMAN_i$ $UNRELDIV_{i,t-1}$ and $DUMSHMAN_i UNRELDIV^2_{i,t-1}$). These interaction terms allow us to capture how the impact of related (unrelated) diversification on firm indebtedness is moderated by the presence of an owner–manager in the business. In family firms with an external manager that does not belong to the owner family, the effect of related (unrelated) diversification on firm leverage is $\beta_1$ and $\beta_2$ (given that $DUMSHMAN_i$ = 0). Meanwhile, in family firms managed by a family member, the effect of the related (unrelated) diversification strategy on firm debt is $(\beta_1 + \gamma_9)$ and $(\beta_2 + \gamma_{10})$ ($(\beta_1 + \gamma_{11})$ and $(\beta_2 + \gamma_{12})$) (given that $DUMSHMAN_i$ = 0). Therefore, to confirm Hypotheses 4a (4b), we expect that $\hat{\beta}_1 + \hat{\gamma}_9 > 0$ and $\hat{\beta}_2 + \hat{\gamma}_{10} < 0$ ($\hat{\beta}_1 + \hat{\gamma}_{11} > 0$ and $\hat{\beta}_2 + \hat{\gamma}_{12} < 0$). It is also necessary that $-(\hat{\beta}_1)/2(\hat{\beta}_2) < -(\hat{\beta}_1 + \hat{\gamma}_9)/2(\hat{\beta}_2 + \hat{\gamma}_{10})$ ($-(\hat{\beta}_1)/2(\hat{\beta}_2) < -(\hat{\beta}_1 + \hat{\gamma}_{11})/2(\hat{\beta}_2 + \hat{\gamma}_{12})$) to corroborate the proposed hypotheses.

*3.3. Estimation method*

Given that unobserved heterogeneity is an important determinant of target debt, as captured in Equation (2), we are compelled to use the panel data methodology in the estimation of the capital structure models. By controlling for this individual effect, we are able to alleviate the risk of obtaining biased results. Specifically, we assume that each company has some individual characteristics that affect the decision-making process and remain constant over time, but are unobservable to the researcher. Among the firm-specific features that the individual effect captures, some relevant ones are managers' personality traits, such as their degree of overconfidence (Malmendier, Tate, & Yan, 2011), and the importance that owners give to the preservation of their SEW. These particular characteristics, which influence corporate strategic and financial decisions, are contained in the individual effect because they do not easily change over time. It is important to control for this unobserved heterogeneity by using the panel data methodology, as we do in the current work, because the factors it represents could play an important role in the analysis of corporate capital structure. An additional advantage of controlling for unobserved heterogeneity is the alleviation of the omitted variable bias (Chi, 2005; Mura, 2007).

In addition to the unobserved heterogeneity problem, the explanatory variables included in the right-hand side of the empirical models may be correlated with the error term, which would create an endogeneity problem. To address this concern, we use a method of instrumental variables: the generalized method of moments (GMM), which embeds all other instrumental variables estimators. Specifically, we use the system GMM to overcome the weak instruments problem that the difference GMM suffers. Indeed, recent research supports that the system GMM is the most adequate method to estimate capital structure models like ours (Flannery & Hankins, 2013; Pindado, Requejo, & la Torre, 2015). Note that our capital structure specification complies with the stationarity assumption since the correlation between the explanatory variables and the unobserved heterogeneity can be assumed constant over time. This is a reasonable assumption over a relatively short time period, as Wintoki, Linck, & Netter (2012) argue. We use the lags from $t-2$ to $t-5$ for all the right-hand side variables as instruments for the equations in differences and only one instrument for the equations in levels, as suggested by Blundell & Bond (1998).

Given that we use the GMM estimator, we need to check for the potential misspecification of the models. First, we use the Hansen *J* statistic of overidentifying restrictions to test for the absence of correlation between the instruments and the random disturbance. Second, we perform the $m_2$ statistic (Arellano & Bond, 1991) to test for the lack of second-order serial correlation in the first-difference residual. In addition, we use Wald tests to check for the joint significance of the reported coefficients, as well as of the country and time dummies.

## 4. Results

Table 5 presents the regression results that enable us to test Hypotheses 1 and 2. Specifically, Column (1) shows the results from estimating the empirical model in which we differentiate between family and non-family firms and when the variable of interest is the related diversification strategy. With this specification, we test Hypothesis 1. Column (2) exhibits the results of the debt model that includes in its right-hand side the unrelated diversification strategy and the interaction terms between the diversification variables and the family dummy. Using this empirical specification, we can test Hypothesis 2.

Table 6 highlights the regression results obtained when we use the subsample of family firms and account for the role of the second largest shareholder of the company. Column (1) presents the estimated coefficients when the main variable of interest is the degree of related diversification. This model, which also includes the interaction terms between diversification and the dummy that equals one for family firms with a financial institution as second largest shareholder, is estimated to test Hypothesis 3a. Column (2) shows the results from estimating the partial adjustment model of debt in which unrelated diversification interacts with the above-mentioned dummy. We use this specification to test Hypothesis 3b.

Finally, in Columns (1) and (2) of Table 7, we present the results of the debt models in which the respective diversification measure (related and unrelated) is interacted with the dummy variable that equals one when the controlling family also occupies a management position. As with the empirical models of Table 6, the two specifications presented in this table are estimated using only the family firm subsample given our interest in analyzing family business heterogeneity. These regressions allow us to test Hypotheses 4a and 4b.

Regarding Hypothesis 1a, we find support for a negative effect of the degree of related diversification on debt for non-family firms, as can be seen in Column (1) of Table 5. The coefficients of related diversification and its square are negative and non-significant respectively (the coefficients on $RELDIV_{i,t-1}$ and $RELDIV_{i,t-1}^2$ are negative and statistically significant, with a value of –0.0075, and statistically non-significant, respectively; see $\hat{\beta}_1$ and $\hat{\beta}_2$). As shown in Figure 1, this means that an increase in the degree of related diversification discourages the use of debt, at least in non-family firms. With respect to the role of family ownership in the diversification–debt relation, the results are in line with Hypothesis 1b. The coefficients on the interaction terms lead to a quadratic effect of related diversification on corporate leverage in the case of family firms (the coefficients on $DUMFAM_i RELDIV_{i,t-1}$ and $DUMFAM_i RELDIV_{i,t-1}^2$ are positive and negative respectively, both statistically significant, with values of 0.0292 and –0.0250; see $\hat{\gamma}_1$ and $\hat{\gamma}_2$). Thus, the coefficient on $RELDIV_{i,t-1}$ for family firms is positive ($\hat{\beta}_1 + \hat{\gamma}_1$ = –0.0075 + 0.0292 = 0.0217 is statistically significant; see $t_1$) and the coefficient on $RELDIV_{i,t-1}^2$ is negative ($\hat{\beta}_2 + \hat{\gamma}_2$ = 0.0043 – 0.0250 = –0.0207 is statistically significant; see $t_2$). This finding corroborates that for family firms the relation between related diversification and leverage exhibits an inverted U-shape, as shown in Figure 1. That is, an increase in the degree of related diversification encourages firm indebtedness, as long as the growth in related diversification does not exceed certain optimal level. Beyond the inflection point, $IP_{FF}$, more diversification discourages the use of debt.

[Insert Table 5 about here]

[Insert Figure 1 about here]

With respect to the unrelated diversification strategy in family and non-family firms, the results presented in Column (2) of Table 5 are in line with Hypothesis 2. Specifically, our results support the idea that increasing the degree of unrelated diversification has a non-linear effect on corporate debt in non-family firms. Note that the coefficients on the unrelated diversification variable and its square are positive and negative respectively (the coefficients on $UNRELDIV_{i,t-1}$ and $UNRELDIV_{i,t-1}^2$ are positive and negative respectively, both statistically significant, with values of 0.0079 and –0.0106; see $\hat{\beta}_1$ and $\hat{\beta}_2$).

As can be seen in Figure 2, corporate debt can be maximized at a particular degree of unrelated diversification. To compute this level, we use the following expression: $IP_{NFF} = -(\beta_1)/2(\beta_2)$. Beyond this point, an increase in unrelated diversification has a negative impact on corporate indebtedness. Our results show that increases in the entropy index based on two-digit SIC codes below 0.3730 lead to higher firm debt. The results obtained support Hypothesis 2a.

[Insert Figure 2 about here]

Our empirical evidence is also consistent with Hypothesis 2b. The estimated coefficients on the interaction terms that capture the effect of unrelated diversification on debt support a more pronounced non-linear relation in family firms (the coefficients on $DUMFAM_i UNRELDIV_{i,t-1}$ and $DUMFAM_i UNRELDIV^2_{i,t-1}$ are positive and negative respectively, both statistically significant, with values of 0.0144 and –0.0082; see $\hat{\gamma}_3$ and $\hat{\gamma}_4$). In particular, we corroborate that the effect of unrelated diversification on corporate debt is non-linear and exhibits an inverted U-shape for family firms.

Furthermore, supporting our expectations as regards the influence of the unrelated diversification strategy on firm debt and the moderating role of family ownership, the inflection points reveal that the level of unrelated diversification that maximizes corporate leverage is reached earlier in non-family firms. That is, $IP_{NFF} = 0.3730 < IP_{FF} = 0.5955$. Consequently, in line with Hypothesis 2a and as Figure 2 shows, family ownership is a firm-specific characteristic that strengthens the effect of unrelated diversification on firm debt. It is worthwhile noting that, as expected, the slope of the curve is more pronounced in family firms.

Regarding how having a financial company as the second largest shareholder moderates the impact of the diversification strategy (related and unrelated) on family firm's leverage, the results obtained are presented in Table 6 and corroborate our expectations. On the one hand, we find support for a non-linear effect of related and unrelated diversification strategies on corporate indebtedness in family firms whose second largest shareholder is not a financial institution. Specifically, Column (1) shows that the coefficients on the related diversification variable and its square are positive and negative respectively (the coefficients on $RELDIV_{i,t-1}$ and $RELDIV^2_{i,t-1}$ are positive and negative respectively, both statistically significant, with values of 0.0121 and –0.0116; see $\hat{\beta}_1$ and $\hat{\beta}_2$). With respect to

unrelated diversification, the coefficients of interest in Column (2) are also positive and negative respectively (the coefficients on $UNRELDIV_{i,t-1}$ and $UNRELDIV_{i,t-1}^2$ are positive and negative respectively, both statistically significant, with values of 0.0127 and –0.0081; see $\hat{\beta}_1$ and $\hat{\beta}_2$).

[Insert Table 6 about here]

On the other hand, when a financial institution is the second largest shareholder in family firms, our results confirm that, regardless of the type of diversification (related or unrelated), the positive effect on debt is more pronounced and, therefore, the inflection point is higher than in the remaining family firms. Specifically, the coefficients on the interaction terms in Column (1) support a more pronounced non-linear relation between related diversification and leverage in family firms with a financial company as the second largest shareholder (the coefficients on $DUMBANK_i RELDIV_{i,t-1}$ and $DUMBANK_i$ $RELDIV_{i,t-1}^2$ are positive and negative respectively, both statistically significant, with values of 0.0236 and –0.0223; see $\hat{\gamma}_5$ and $\hat{\gamma}_6$). Furthermore, as Figure 3a highlights, the inflection point at which the relation between related diversification and debt turns from positive to negative is higher (although marginally) in family firms in which the second largest shareholder is a financial firm than in family firms with other types of second shareholders ($IP_{OSS} = 0.5196 < IP_{FSS} = 0.5270$). Our results confirm Hypothesis 3a.

[Insert Figure 3a about here]

Similar results are obtained when we analyze the unrelated diversification strategy. The coefficients of interest in Column (2) also support a more pronounced non-linear relation between unrelated diversification and leverage in family firm in which the controlling family is monitored by a financial institution (the coefficients on $DUMBANK_i$ $UNRELDIV_{i,t-1}$ and $DUMBANK_i UNRELDIV_{i,t-1}^2$ are positive and negative respectively, both statistically significant, with values of 0.0301 and –0.0029; see $\hat{\gamma}_7$ and $\hat{\gamma}_8$). Additionally, as Figure 3b highlights, the inflection points differ across family firms depending on the type of the second largest shareholder, being the inflection point higher when the second largest shareholder is a financial firm ($IP_{OSS} = 0.7783 < IP_{FSS} = 1.9426$). These results are in line with Hypothesis 3b.

[Insert Figure 3b about here]

Finally, we discuss the results that highlight how the presence of family members in the management team moderates the impact of the diversification strategy (related and unrelated) on firm leverage. The results that enable us to analyze this issue are presented in Table 7 and are in line with expectations.

[Insert Table 7 about here]

First, regardless of the diversification strategy adopted by the company (related or unrelated), we find a non-linear effect of diversification on firm indebtedness (inverted U-shape) in family firms managed by an external director (non-manager shareholder). The coefficients on the related and unrelated diversification variables in Columns (1) and (2) respectively are in both cases positive (linear effects) and negative (quadratic effects) (the coefficients on $RELDIV_{i,t-1}$and $RELDIV_{i,t-1}^2$ are positive and negative respectively, both statistically significant, with values of 0.0133 and –0.0181; see $\hat{\beta}_1$ and $\hat{\beta}_2$, while the coefficients on $UNRELDIV_{i,t-1}$and $UNRELDIV_{i,t-1}^2$ are positive and negative respectively, both statistically significant, with values of 0.0198 and –0.0113; see $\hat{\beta}_1$ and $\hat{\beta}_2$).

Second, in family firms where family owners occupy managerial positions, the positive effect of diversification on debt is more pronounced and, as a consequence, the inflection point is higher than in firms with an external manager. These results apply to both diversification strategies (related and unrelated). Specifically, the coefficients on the interaction terms in Column (1) support a more pronounced non-linear relation between related diversification and leverage in family firms with a family manager (the coefficients on $DUMSHMAN_i RELDIV_{i,t-1}$ and $DUMSHMAN_i RELDIV_{i,t-1}^2$ are positive and statistically significant, with a value of 0.0158, and statistically non-significant, respectively; see $\hat{\gamma}_9$ and $\hat{\gamma}_{10}$). As Figure 4a highlights, the level of diversification at which debt is maximized (the inflection point) is higher when the family holds management positions than in family firms with an external manager ($IP_{OM} = 0.3686 < IP_{SM} = 0.8062$). The empirical evidence confirms Hypothesis 4a.

[Insert Figure 4a about here]

In addition, we obtain similar results when we focus on the unrelated diversification strategy. The coefficients on the interaction terms in Column (2) also support a higher inflection point (the coefficients on $DUMSHMAN_i UNRELDIV_{i,t-1}$ and $DUMSHMAN_i$ $UNRELDIV_{i,t-1}^2$ are positive and negative respectively, both statistically significant, with

values of 0.0738 and –0.0410; see $\hat{\gamma}_{11}$ and $\hat{\gamma}_{12}$). Additionally, as Figure 4b shows, the inflection point for family firms in which the owner family is present in the management team is to the right (although marginally) of the inflection point for the remaining family firms ($IP_{OM} = 0.8749 < IP_{SM} = 0.8941$). These results provide support to Hypothesis 4b.

[Insert Figure 4b about here]

With respect to the remaining variables included in the debt models, although family ownership moderates the effect of diversification on debt, we find no significant direct effect of this firm characteristic (the coefficients on $DUMFAM_i$ in Table 5 are statistically non-significant in Columns (1) and (2); see $\hat{\beta}_3$). However, having a financial company as the second largest shareholder impacts positively on firm debt, although only in the specification used to check the effect of the related diversification strategy. Regarding the model used to examine the influence of unrelated diversification, the identity of the second largest shareholder has no significant direct effect on firm leverage (the coefficients on $DUMBANK_i$ are positive and statistically significant, with a value of 0.0015, and statistically non-significant in Columns (1) and (2) of Table 6, respectively; see $\hat{\beta}_3$). In addition, we find that, when family owners hold managerial positions, family firms tend to use more debt, regardless of the diversification strategy under analysis (the coefficients on $DUMSHMAN_i$ are positive and statistically significant with values of 0.0096 and 0.0164 in Columns (1) and (2) of Table 7, respectively; see $\hat{\beta}_3$).

With respect to the control variables, we find patterns of pecking order behavior in several specifications, in the sense that a significant negative relation exists between profitability and debt (the coefficients on $PROFIT_{i,t-1}$ are negative and statistically significant with values of –0.0289, –0.0280, and –0.0065 in Columns (1) and (2) of Table 5, and in Column (2) of Table 6, respectively; see $\hat{\beta}_5$). In addition, our results support a positive effect of growth opportunities on debt (the coefficients on $MTB_{i,t-1}$ are positive and statistically significant with values of 0.0027, 0.0020, 0.0047, 0.0046, 0.0044, and 0.0043 in Columns (1) and (2) of Tables 5, 6, and 7, respectively; see $\hat{\beta}_6$). Our results suggest that firms with higher growth potential look for additional external financing, such as debt.

The amount of taxes paid by companies has a positive effect on leverage in our first specifications, supporting the trade-off theory (the coefficients on $TAXES_{i,t-1}$ are positive

and statistically significant with values of 0.0084 and 0.0093 in Columns (1) and (2) of Table 5, respectively; see $\hat{\beta}_7$). In addition, non-debt tax shields have a negative impact on firm debt in all empirical models (the coefficients on $DEPAMTA_{i,t-1}$ are negative and statistically significant with values of –0.0712, –0.0725, –0.0566, –0.0520, –0.0544, and –0.0569 in Columns (1) and (2) of Tables 5, 6, and 7, respectively; see $\hat{\beta}_8$). Therefore, they seem to substitute for debt in order to alleviate the tax burden.

Regarding the size of the company, we find a positive effect on leverage in all models (the coefficients on $SIZE_{i,t-1}$ are positive and statistically significant with values of 0.0066, 0.0059, 0.0042, 0.0040, 0.0046, and 0.0047 in Columns (1) and (2) of Tables 5, 6, and 7, respectively; see $\hat{\beta}_9$), which is consistent with the vast majority of previous studies. Furthermore, empirical evidence also supports a positive relation between the proportion of tangible assets and debt (the coefficients on $TANG_{i,t-1}$ are positive and statistically significant with values of 0.0175, 0.0194, 0.0052, 0.0114, 0.0082, and 0.0058 in Columns (1) and (2) of Tables 5, 6, and 7, respectively; see $\hat{\beta}_{10}$). This result is consistent with the idea that tangible assets facilitate indebtedness by serving as collateral.

Except for two models in which unrelated diversification is the key variable, we find a positive relation between industry leverage and corporate debt (the coefficients on $INDLEV_{i,t-1}$ are positive and statistically significant with values of 0.0480 in Column (1) of Table 5; 0.0815 and 0.0956 in Columns (1) and (2) of Table 6; and 0.0415 in Column (1) of Table 7; see $\hat{\beta}_{11}$). This finding supports the idea that industry leverage is often used as a proxy for target debt (Flannery & Rangan, 2006; Frank & Goyal, 2009). Conversely, liquidity has a negative impact on the level of debt (the coefficients on $LIQ_{i,t-1}$ are negative and statistically significant with values of –0.0061, –0.0053, –0.0075, –0.0077, –0.0077, and –0.0074 in Columns (1) and (2) of Tables 5, 6, and 7, respectively; see $\hat{\beta}_{12}$), which confirms that firms with more liquid assets can use them as internal sources of funds and as substitutes for debt. Finally, regarding the last of the firm-level control variables, we find a negative effect of asset turnover on firm indebtedness (the coefficients on $AT_{i,t-1}$ are negative and statistically significant with values of –0.0073, –0.0076, –0.0069, –0.0081, –0.0053, and –0.0049 in Columns (1) and (2) of Tables 5, 6, and 7, respectively; see $\hat{\beta}_{13}$). Considering that the asset turnover ratio is introduced to capture managerial efficiency in

the use of corporate assets (Singh, Davidson, & Suchard, 2003; Pindado, Requejo, & de la Torre, 2015) because it is an inverse measure of agency costs (Ang, Cole, & Lin, 2000), a negative effect suggests that more efficient firms rely less on corporate debt.

We now turn our attention to the variables that enable us to control for the macroeconomic effects on corporate leverage. Consistent with previous literature (Öztekin & Flannery, 2012) the inflation rate and economic growth impact negatively on firm debt (the coefficients on $INFLATION_{j,t-1}$ are negative and statistically significant with values of –0.0238, –0.0240, –0.0288, –0.0312, –0.0422, and –0.0503 in Columns (1) and (2) of Tables 5, 6, and 7, respectively; see $\hat{\beta}_{14}$; while the coefficients on $GDPGROWTH_{j,t-1}$ are negative and statistically significant with values of –0.0572, –0.0763, –0.3311, –0.3318, –0.3109, and –0.3455 in Columns (1) and (2) of Tables 5, 6, and 7, respectively; see $\hat{\beta}_{15}$).

## 5. Robustness checks

In this section, we test whether our results are robust to the use of the market value of debt, instead of the book value of debt, in Equation (1) and as dependent variable in our empirical specifications. Table 8 presents the results of our additional regression analyses for Hypotheses 1 and 2, while Tables 9 and 10 highlight the coefficients that enable us to test Hypotheses 3 and 4, respectively. First of all, it is worth noting that the empirical evidence we obtain using the market value of leverage is consistent with the previous regression analyses, in which the book value of debt is used as dependent variable.

In particular, we confirm that the effect of related diversification on firm debt is negative for non-family firms and non-linear (inverted U-shape) when the firm is owned by a family. These results are consistent with the main analyses. The estimated coefficients presented in Column (1) of Table 8 provide further support for Hypothesis 1.

[Insert Table 8 about here]

Regarding the effect of unrelated diversification on corporate leverage, regardless of the type of ownership (family or non-family control), we also find a non-linear relation between both variables. These findings continue to support the idea that a higher degree of diversification encourages firms to finance their projects with debt as long as the growth in diversification does not exceed the optimal level. In addition, we also confirm that in family firms the positive effect of diversification on debt is more pronounced, and thus the optimal

level of diversification is higher than in non-family firms. The estimated coefficients presented in Column (2) of Table 8 are in line with Hypothesis 2.

Focusing now on how alternative corporate governance mechanisms moderate the effect of diversification on debt in the family firm subsample, the results remain consistent with our previous findings. Specifically, having a financial company as the second largest shareholder strengthens the positive effect of diversification on corporate leverage, regardless of the diversification type (related or unrelated). Our empirical evidence allows us to confirm Hypothesis 3. The coefficients in Columns (1) and (2) of Table 9 highlight that the relations found are robust to an alternative debt measure.

[Insert Table 9 about here]

In addition, the new regression results on the presence of family owners in the management team of the company remain unchanged when the market value of debt is used in the analyses (see Table 10). Specifically, we confirm that the non-linear relation between diversification (related and unrelated) and debt is more pronounced in family firms managed by family shareholders compared to family firms without family involvement in managerial positions. As a consequence, the optimal degree of diversification at which firm debt is maximized is reached at a higher level when the family actively participates in management. Therefore, our new results are in line with Hypothesis 4.

[Insert Table 10 about here]

## 6. Conclusions

This study provides new insights on the factors that determine the capital structure of companies establishing new links between the corporate strategy and the financial decisions of firms. In particular, our empirical evidence highlights the importance of diversification strategies for corporate leverage in an international context.

Consistent with previous literature, this study investigates the effect of related and unrelated diversification on firm debt. In addition, we go a step further and show that it is necessary to account for a firm's ownership structure in this type of analysis on the relation between strategic and financial policies. Our results confirm that the type of owner, and more precisely the differentiation between family and non-family control, moderates the impact of diversification on leverage.

On the one hand, our findings reveal that the degree of related diversification has a negative influence on corporate leverage in non-family firms. However, we find a non-linear effect (inverted U-shape) in the family firm subsample. On the other hand, when we analyze unrelated diversification strategies, empirical evidence shows that the effect on capital structure exhibits an inverted U-shape regardless of the ownership structure of the firm. Nevertheless, the relation between unrelated diversification and corporate debt is more pronounced among family firms.

In addition, we also account for family firm heterogeneity and explore how differences in corporate governance mechanisms within this type of company moderate the effect of diversification strategies on corporate leverage. In this regard, we focus on two particular dimensions; namely, (i) the presence of a financial institution as the second largest shareholder and (ii) active involvement of the controlling family in the management of the business.

The relation between diversification (related and unrelated) and corporate leverage is non-linear (inverted U-shape) in all family firms regardless of their internal governance structures. However, when the second largest shareholder is a financial company, the effect of diversification on debt is more pronounced. As a consequence, the inflection point up to which both firm dimensions are positively related moves to the right. The same occurs in family firms in which the controlling family participates in management. That is, in these firms, the impact of diversification on debt is stronger. The stronger effect implies that the level of diversification at which leverage is maximized moves to the right and the diversification interval in which diversification and debt exhibit a positive relation increases.

**References**


Aggarwal, R. K., & Samwick, A. A. (2003). Why do managers diversify their firms? Agency reconsidered. *The Journal of Finance, 58*(1), 71-118.

Ali, A., Chen, T. Y., & Radhakrishnan, S. (2007). Corporate disclosures by family firms. *Journal of Accounting and Economics, 44*(1), 238-286.

Anderson, R. C., Bates T.W., Bizjak, J. M., & Lemmon, M. L. (2000). Corporate governance and firm diversification. *Financial Management, 29*(1), 5-22.

Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2003). Founding family ownership and the agency cost of debt. *Journal of Financial economics, 68*(2), 263-285.

Anderson, R. C., & Reeb, D. M. (2003a). Founding-family ownership and firm performance: Evidence from the S&P 500. *The Journal of Finance, 58*(3), 1301-1328.

Anderson, R. C., & Reeb, D. M. (2003b). Founding-family ownership, corporate diversification, and firm leverage. *Journal of Law and Economics, 46*(2), 653-684.

Andres, C., Betzer, A., Bongard, I., Haesner, C., & Theissen, E. (2013). The information content of dividend surprises: Evidence from Germany. *Journal of Business Finance & Accounting, 40*(5-6), 620-645.

Ang, J. S., Cole, R. A., & Lin, J. W. (2000). Agency costs and ownership structure. *The Journal of Finance, 55*(1), 81-106.

Barton, S. L., & Gordon, P. I. (1987). Corporate strategy: Useful perspective for the study of capital structure? *Academy of Management Review, 12*(1), 67-75.

Barton, S. L., & Gordon, P. J. (1988). Corporate strategy and capital structure. *Strategic Management Journal, 9*(6), 623-632.

Berger, P. G., & Ofek, E. (1996). Bustup takeovers of value-destroying diversified firms. *The Journal of Finance, 51*(4), 1175-1200.

Bergh, D. D. (1997). Predicting divestiture of unrelated acquisitions: An integrative model of ex ante conditions. *Strategic Management Journal, 18*(9),715-731.

Bertrand, M., & Schoar, A. (2003). Managing with style: The effect of managers on firm policies. *The Quarterly Journal of Economics, 118*(4), 1169–1208.

Block, J. H. (2012). R&D investments in family and founder firms: An agency perspective. *Journal of Business Venturing, 27*(2), 248-265.

Burgman, T. A. (1996). An empirical examination of multinational corporate capital structure. *Journal of International Business Studies*, 27(3), 553-570.

Burkart, M., Panunzi, F., & Shleifer, A. (2003). Family firms. *The Journal of Finance, 58*(5), 2167-2202.

Casson, M. (1999). The economics of the family firm. *Scandinavian Economic History Review, 47*(1), 10-23.

Chatterjee, S., & Wernerfelt, B. (1991). The link between resources and type of diversification: Theory and evidence. *Strategic Management Journal, 12*(1), 33-48.

Chen, C. J., Cheng, C. A., He, J., & Kim, J. (1997). An investigation of the relationship between international activities and capital structure. *Journal of International Business Studies, 28*(3), 563-577.

Chi, J. D. (2005). Understanding the endogeneity between firm value and shareholder rights. *Financial Management, 34*(4), 65-76.

Chrisman, J. J., Chua, J. H., & Litz, R. A. (2004). Comparing the agency costs of family and non-family firms: Conceptual issues and exploratory evidence. *Entrepreneurship Theory and Practice, 28*(4), 335-354.

Chrisman, J. J., Chua, J. H., & Sharma, P. (2005). Trends and directions in the development of a strategic management theory of the family firm. *Entrepreneurship Theory and Practice, 29*(5), 555-576.

Comment, R., & Jarrell, G. A. (1995). Corporate focus and stock returns. *Journal of Financial Economics, 37*(1), 67-87.

Croci, E., Doukas, J., & Gonenc, H. (2011). Family control and financing decisions. *European Financial Management*, 17(5), 860–897.

de Andrés, P., de la Fuente, G., & Velasco, P. (2016). Are real options a missing piece in the diversification-value puzzle? *International Review of Financial Analysis, 48*, 261-271.

de Andrés, P., de la Fuente, G., & Velasco, P. (2017). Does it really matter how a firm diversifies? Assets-in-place diversification versus growth options diversification. *Journal of Corporate Finance, 43*, 316-339.

D'Mello, R., & Miranda, M. (2010). Long-term debt and overinvestment agency problem. *Journal of Banking & Finance, 34*(2), 324-335.

Doukas, J. A., & Kan, O. B. (2006). Does global diversification destroy firm value? *Journal of International Business Studies, 37*(3), 352-371.

Duchin, R. (2010). Cash holdings and corporate diversification. *The Journal of Finance, 65*(3), 955-992.

Faccio, M., Lang, L. H., & Young, L. (2001). Dividends and expropriation. *American Economic Review, 91*(1), 54-78.

Faccio, M., & Lang, L. H. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics, 65*(3), 365-395.

Fatemi, A. M. (1988). The effect of international diversification on corporate financing policy. *Journal of Business Research, 16*(1), 17-30.

Florackis, C., & Ozkan, A. (2009). Managerial incentives and corporate leverage: evidence from the United Kingdom. *Accounting & Finance, 49*(3), 531-553.

Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: Which factors are reliably important? *Financial Management, 38*(1), 1-37.

Galván, A., Pindado, J., & de la Torre, C. (2014). Diversification: A value-creating or value-destroying strategy? Evidence from the Eurozone countries. *Journal of Financial Management, Markets and Institutions, 2*(1), 43-64.

Gómez-Mejía, L. R., Haynes, K. T., Núñez-Nickel, M., Jacobson, K. J., & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly, 52*(1), 106-137.

Gómez-Mejía, L. R., Makri, M., & Larraza-Kintana, M. (2010). Diversification decisions in family-controlled firms. *Journal of Management Studies, 47*(2), 223-252.

Habbershon, T. G., & Williams, M. L. (1999). A resource-based framework for assessing the strategic advantages of family firms. *Family Business Review, 12*(1), 1-25.

Hann, R. N., Ogneva, M., & Ozbas, O. (2013). Corporate diversification and the cost of capital. *The Journal of Finance, 68*(5), 1961-1999.

Hitt, M. A., Hoskisson, R. E., & Kim, H. (1997). International diversification: Effects on innovation and firm performance in product-diversified firms. *Academy of Management Journal, 40*(4), 767-798.

Hitt, M. A., Tihanyi, L., Miller, T., & Connelly, B. (2006). International diversification: Antecedents, outcomes, and moderators. *Journal of Management, 32*(6), 831-867.

Hoskisson, R. E., Hitt, M. A., Johnson, R. A., & Moesel, D. D. (1993). Construct validity of an objective (entropy) categorical measure of diversification strategy. *Strategic management journal, 14*(3), 215-235.

Jandik, T., & Makhija, A. K. (2005). Can diversification create value? Evidence from the electric utility industry. *Financial Management, 34*(1), 61-93.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review, 76*(2), 323-329.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360.

Jordan, J., Lowe, J., & Taylor, P. (1998). Strategy and financial policy in UK small firms. *Journal of Business Finance & Accounting, 25*(1-2), 1-27.

Kaplan, S. N., & Weisbach, M. S. (1992). The success of acquisitions: Evidence from divestitures. *The Journal of Finance, 47*(1), 107-138.

Keasey, K., Martínez, B., & Pindado, J. (2015). Young family firms: Financing decisions and the willingness to dilute control. *Journal of Corporate Finance, 34*, 47–63.

Kellermanns, F. W., Eddleston, K. A., Sarathy, R., & Murphy, F. (2012). Innovativeness in family firms: A family influence perspective. *Small Business Economics, 38*(1), 85-101.

Kim, E. H., & McConnell, J. J. (1977). Corporate mergers and the co-insurance of corporate debt. *The Journal of Finance, 32*(2), 349-365.

King, M., & Santor, E. (2008). Family values: Ownership structure, performance, and capital structure of Canadian firms. *Journal of Banking & Finance, 32*(11), 2423-2432.

Kistruck, G. M., Qureshi, I., & Beamish, P. W. (2013). Geographic and product diversification in charitable organizations. *Journal of Management, 39*(2), 496-530.

Kochhar, R. (1996). Explaining firm capital structure: The role of agency theory vs. transaction cost economics. *Strategic Management Journal, 17*(9), 713-728.

Kochhar, R., & Hitt, M. A. (1998). Linking corporate strategy to capital structure: diversification strategy, type and source of financing. *Strategic Management Journal, 19*(6), 601-610.

Koropp, C., Grichnik, D., & Kellermanns, F. (2013). Financial attitudes in family firms: The moderating role of family commitment. *Journal of Small Business Management, 51*(1), 114-137.

Kraiczy, N. D., Hack, A., & Kellermanns, F. W. (2014). New product portfolio performance in family firms. *Journal of Business Research, 67*(6), 1065-1073.

Kuppuswamy, V., & Villalonga, B. (2010). Does diversification create value in the presence of external financing constraints? Evidence from the 2007–2009 financial crisis. *Management Science, 62*(4), 905-923.

Kwok, C. C., & Reeb, D. M. (2000). Internationalization and firm risk: An upstream-downstream hypothesis. *Journal of International Business Studies, 31*(4), 611-629.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. *The Journal of Finance, 54*(2), 471-517.

La Rocca, M., La Rocca, T., Gerace, D., & Smark, C. (2009). Effect of diversification on capital structure. *Accounting & Finance, 49*(4), 799-826.

Le Breton-Miller, I., Miller, D., & Lester, R. H. (2011). Stewardship or agency? A social embeddedness reconciliation of conduct and performance in public family businesses. *Organization Science, 22*(3), 704-721.

Lee, P. M., & O'neill, H. M. (2003). Ownership structures and R&D investments of U.S. and Japanese firms: Agency and stewardship perspectives. *Academy of Management Journal, 46*(2), 212-225.

Lewellen, W. G. (1971). A pure financial rationale for the conglomerate merger. *The Journal of Finance, 26*(2), 521-537.

Li, D. D., & Li, S. (1996). A theory of corporate scope and financial structure. *The Journal of Finance, 51*(2), 691-709.

Lins, K. V., Volpin, P., & Wagner, H. F. (2013). Does family control matter? International evidence from the 2008–2009 financial crisis. *Review of Financial Studies, 26*(10), 2583-2619.

Low, P. Y., & Chen, K. H. (2004). Diversification and capital structure: Some international evidence. *Review of Quantitative Finance and Accounting, 23*(1), 55-71.

Mahoney, J. T., & Pandian, J. R. (1992). The resource-based view within the conversation of strategic management. *Strategic Management Journal, 13*(5), 363-380.

Malmendier, U., Tate, G., & Yan, J. (2011). Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies. *The Journal of Finance, 66*(5), 1687-1733.

Markides, C. C., & Williamson, P. J. (1996). Corporate diversification and organizational structure: A resource-based view. *Academy of Management Journal, 39*(2), 340-367.

Maury, B. (2006). Family ownership and firm performance: Empirical evidence from Western European corporations. *Journal of Corporate Finance, 12*(2), 321-341.

Maury, B., & Pajuste, A. (2005). Multiple large shareholders and firm value. *Journal of Banking & Finance, 29*(7), 1813-1834.

McConaughy, D. L. (2000). Family CEOs vs. nonfamily CEOs in the family-controlled firm: An examination of the level and sensitivity of pay to performance. *Family Business Review, 13*(2), 121-131.

Menéndez-Alonso, E. J. (2003). Does diversification strategy matter in explaining capital structure? Some evidence from Spain. *Applied Financial Economics, 13*(6), 427-430.

Michaelas, N., Chittenden, F., & Poutziouris, P. (1999). Financial policy and capital structure choice in UK SMEs: Empirical evidence from company panel data. *Small Business Economics, 12*(2), 113–130.

Miguel, A., & Pindado, J. (2001). Determinants of capital structure: new evidence from Spanish panel data. *Journal of Corporate Finance, 7*(1), 77-99.

Miguel, A., Pindado, J., & de la Torre, C. (2005). How do entrenchment and expropriation phenomena affect control mechanisms? *Corporate Governance: An International Review, 13*(4), 505-516.

Muñoz-Bullón, F., & Sánchez-Bueno, M. J. (2012). Do family ties shape the performance consequences of diversification? Evidence from the European Union. *Journal of World Business, 47*(3), 469-477.

Mura, R. (2007). Firm performance: Do non-executive directors have minds of their own? Evidence from UK panel data. *Financial Management, 36*(3), 81-112.

Ngah-Kiing Lim, E., Das, S. S., & Das, A. (2009). Diversification strategy, capital structure, and the Asian financial crisis (1997–1998): Evidence from Singapore firms. *Strategic Management Journal, 30*(6), 577-594.

O'Brien, J. P., David, P., Yoshikawa, T., & Delios, A. (2014). How capital structure influences diversification performance: A transaction cost perspective. *Strategic Management Journal, 35*(7), 1013-1031.

Park, K., & Jang, S. S. (2013). Capital structure, free cash flow, diversification and firm performance: A holistic analysis. *International Journal of Hospitality Management, 33*, 51-63.

Pindado, J., Requejo, I., & de la Torre, C. (2011). Family control and investment–cash flow sensitivity: Empirical evidence from the Euro zone. *Journal of Corporate Finance, 17*(5), 1389-1409.

Pindado, J., Requejo, I., & de la Torre, C. (2015). Does family control shape corporate capital structure? An empirical analysis of Eurozone firms. *Journal of Business Finance & Accounting, 42*(7-8), 965-1006.

Pindado, J., Requejo, I., & Rivera, J. C. (2017). Economic forecast and corporate leverage choices: The role of the institutional environment. *International Review of Economics & Finance, 51*, 121-144.

Sacristán-Navarro, M., Gómez-Ansón, S., & Cabeza-García, L. (2011). Family ownership and control, the presence of other large shareholders, and firm performance: Further evidence. *Family Business Review, 24*(1), 71-93.

Sanchez-Bueno, M. J., & Usero, B. (2014). How may the nature of family firms explain the decisions concerning international diversification? *Journal of Business Research, 67*(7), 1311-1320.

Schulze, W. S., Lubatkin, M. H., Dino, R. N., & Buchholtz, A. K. (2001). Agency relationships in family firms: Theory and evidence. *Organization Science, 12*(2), 99-116.

Schulze, W. S., Lubatkin, M. H., & Dino, R. N. (2003a). Exploring the agency consequences of ownership dispersion among the directors of private family firms. *Academy of Management Journal, 46*(2), 179-194.

Schulze, W. S., Lubatkin, M. H., & Dino, R. N. (2003b). Toward a theory of agency and altruism in family firms. *Journal of Business Venturing, 18*(4), 473-490.

Setia-Atmaja, L., Tanewski, G. A., & Skully, M. (2009). The role of dividends, debt and board structure in the governance of family controlled firms. *Journal of Business Finance & Accounting, 36*(7-8), 863-898.

Shleifer, A., & Vishny, R. W. (1989). Management entrenchment: The case of manager-specific investments. *Journal of Financial Economics, 25*(1), 123-139.

Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance, 52(*2), 737-783.

Singh, M., Davidson, W. N., & Suchard, J. A. (2003). Corporate diversification strategies and capital structure. *The Quarterly Review of Economics and Finance, 43*(1), 147-167.

Staglianò, R., La Rocca, M., & La Rocca, T. (2014). Agency costs of free cash flow, internal capital markets and unrelated diversification. *Review of Managerial Science, 8*(2), 145-174.

Thomsen, S., & Pedersen, T. (2000). Ownership structure and economic performance in the largest European companies. *Strategic Management Journal, 21*(6), 689-705.

Tong, Z. (2011). Firm diversification and the value of corporate cash holdings. *Journal of Corporate Finance, 17*(3), 741-758.

Villalonga, B., & Amit, R. (2006). How do family ownership, control and management affect firm value? *Journal of Financial Economics, 80*(2), 385-417.

Wan, W. P., Hoskisson, R. E., Short, J. C., & Yiu, D. W. (2011). Resource-based theory and corporate diversification: Accomplishments and opportunities. *Journal of Management, 37*(5), 1335-1368.

Wang, D. (2006). Founding family ownership and earnings quality. *Journal of Accounting Research, 44*(3), 619-656.

Wiersema, M. F., & Bowen, H. P. (2008). Corporate diversification: The impact of foreign competition, industry globalization, and product diversification. *Strategic Management Journal, 29*(2), 115-132.

Williamson, O. E. (1988). Corporate finance and corporate governance. *The Journal of Finance, 43*(3), 567-591.

Yoshikawa, T., & Rasheed, A. A. (2010). Family control and ownership monitoring in family-controlled firms in Japan. *Journal of Management Studies, 47*(2), 274-295.

Zahra, S. A. (2012). Organizational learning and entrepreneurship in family firms: Exploring the moderating effect of ownership and cohesion. *Small Business Economics, 38*(1), 51-65.

Zellweger, T. (2007). Time horizon, costs of equity capital, and generic investment strategies of firms. *Family Business Review, 20*(1), 1-15.

Zhou, X. (2001). Understanding the determinants of managerial ownership and the link between ownership and performance: comment. *Journal of Financial Economics*, *62*(3), 559-571.

**Figure 1. Relation between related diversification and corporate capital structure: Family versus non-family firms**

This figure shows the negative effect of related diversification on non-family firms' leverage and the inverted U-shape relation between related diversification and family firms' debt. The representation is based on the quadratic specification in Equation (6). The derivation of the inflection point is based on this specification. $IP_{FF} = -(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$ is the inflection point at which the relation between related diversification and total debt turns from positive to negative.

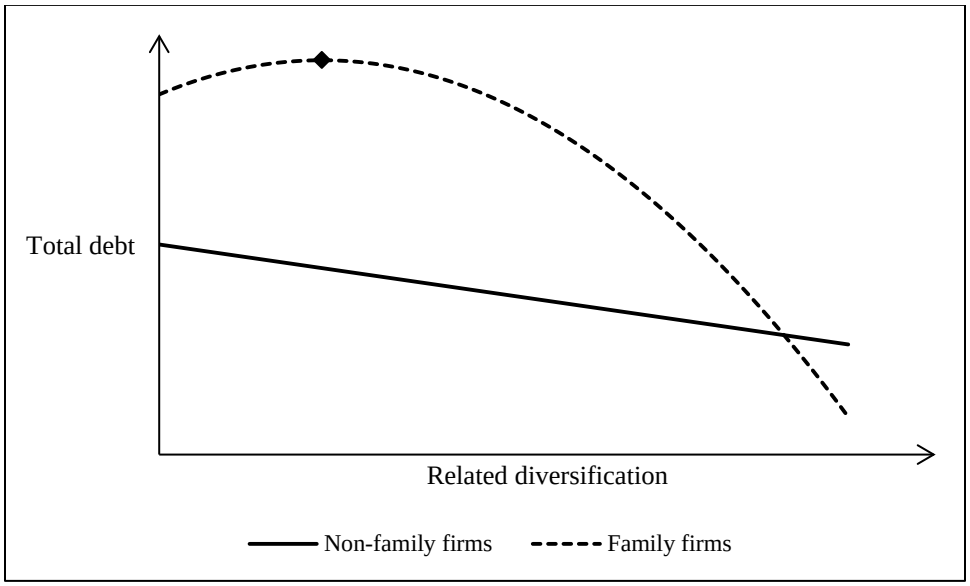


**Figure 2. Relation between unrelated diversification and corporate capital structure: Family versus non-family firms**

This figure shows the inverted U-shape relation between unrelated diversification and debt in family and non-family firms. The representation is based on the quadratic specification in Equation (6). The derivation of the inflection points is based on this specification. $IP_{NFF} = -(\hat{\beta}_1)/2(\hat{\beta}_2)$ and $IP_{FF} = -(\hat{\beta}_1 + \hat{\gamma}_3)/2(\hat{\beta}_2 + \hat{\gamma}_4)$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.

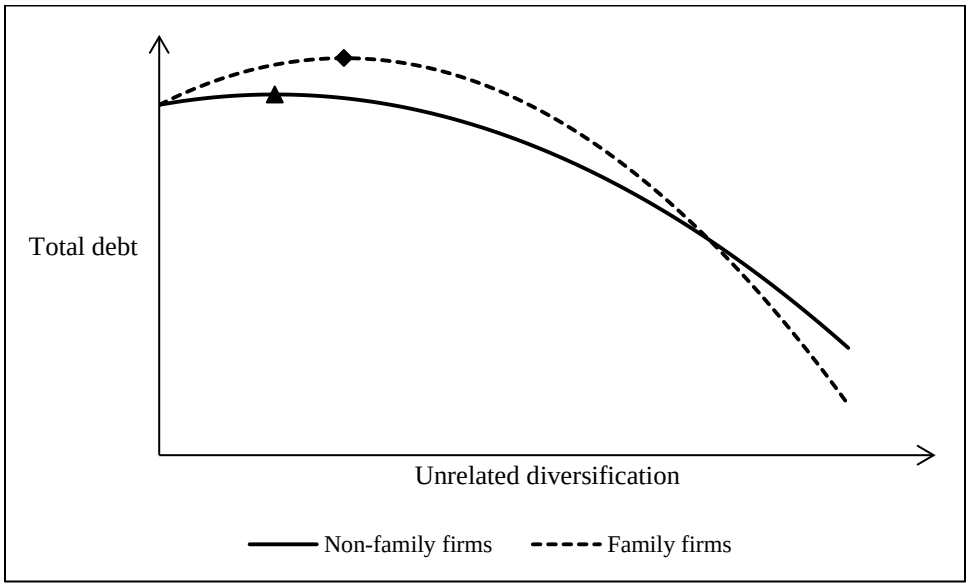

**Figure 3a. Relation between related diversification and corporate capital structure accounting for family firm heterogeneity: Nature of the second largest shareholder**

This figure shows the inverted U-shape relation between related diversification and debt among family firms accounting for the nature of the second largest shareholder. The representation is based on the quadratic specification in Equation (6). The derivation of the inflection points is based on this specification. $IP_{OSS} = -(\hat{\beta}_1)/2(\hat{\beta}_2)$ and $IP_{FSS} = -(\hat{\beta}_1 + \hat{\gamma}_5)/2(\hat{\beta}_2 + \hat{\gamma}_6)$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.

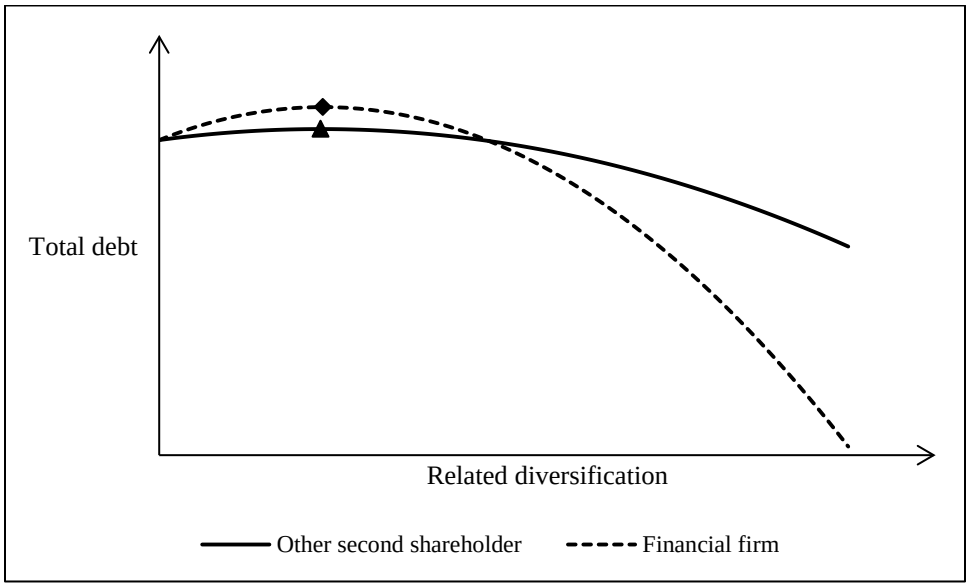


**Figure 3b. Relation between unrelated diversification and corporate capital structure accounting for family firm heterogeneity: Nature of the second largest shareholder**

This figure shows the inverted U-shape relation between unrelated diversification and debt among family firms accounting for the nature of the second largest shareholder. The representation is based on the quadratic specification in Equation (6). The derivation of the inflection points is based on this specification. $IP_{OSS} = -(\hat{\beta}_1)/2(\hat{\beta}_2)$ and $IP_{FSS} = -(\hat{\beta}_1 + \hat{\gamma}_7)/2(\hat{\beta}_2 + \hat{\gamma}_8)$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.

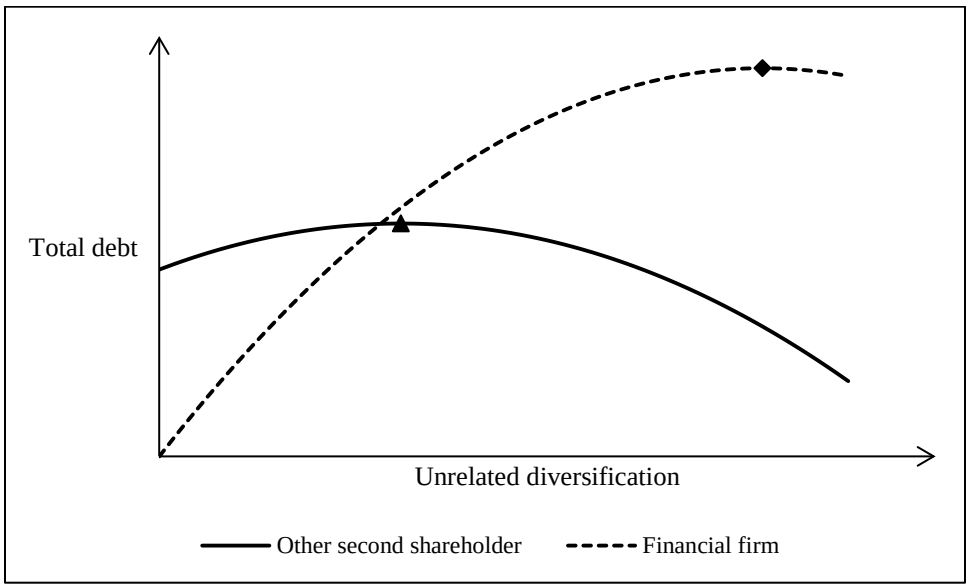

**Figure 4a. Relation between related diversification and corporate capital structure accounting for family firm heterogeneity: External versus family manager**

This figure shows the inverted U-shape relation between related diversification and debt among family firms accounting for whether family owners occupy management positions. The representation is based on the quadratic specification in Equation (6). The derivation of the inflection points is based on this specification. $IP_{OM} = -(\hat{\beta}_1)/2(\hat{\beta}_2)$ and $IP_{SM} = -(\hat{\beta}_1 + \hat{\gamma}_9)/2(\hat{\beta}_2 + \hat{\gamma}_{10})$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.

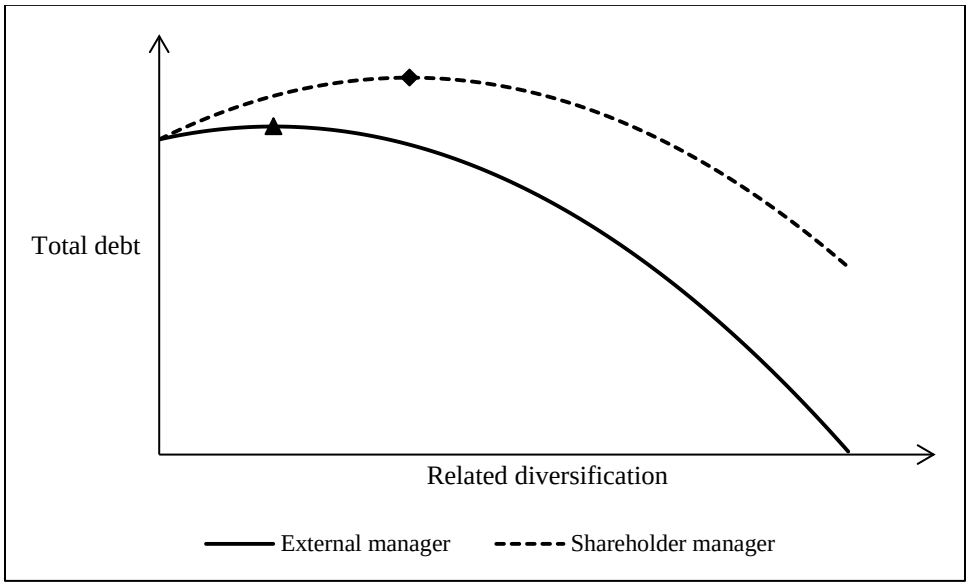


**Figure 4b. Relation between unrelated diversification and corporate capital structure accounting for family firm heterogeneity: External versus family manager**

This figure shows the inverted U-shape relation between unrelated diversification and debt among family firms accounting for whether family owners occupy management positions. The representation is based on the quadratic specification in Equation (6). The derivation of the inflection points is based on this specification. $IP_{OM} = -(\hat{\beta}_1)/2(\hat{\beta}_2)$ and $IP_{SM} = -(\hat{\beta}_1 + \hat{\gamma}_{11})/2(\hat{\beta}_2 + \hat{\gamma}_{12})$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.

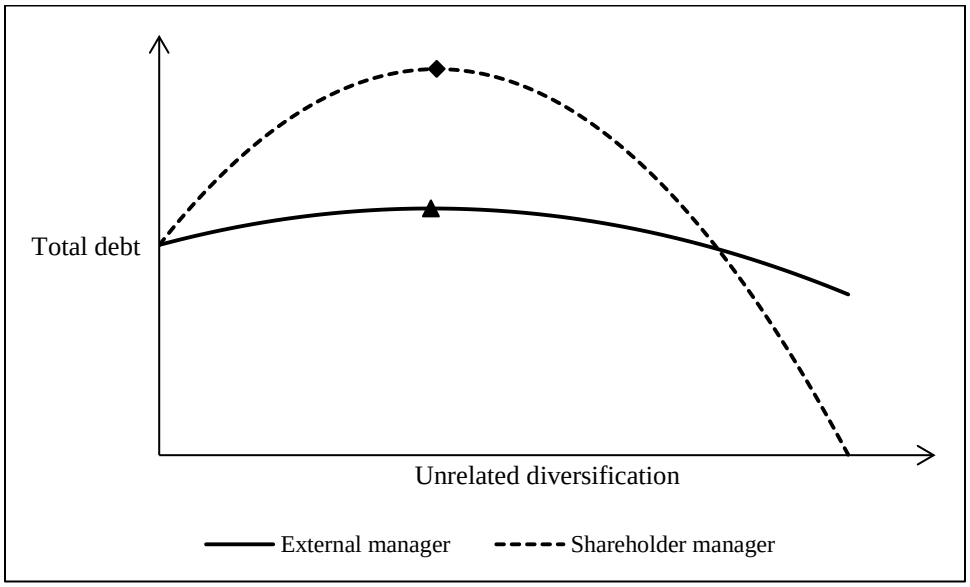

**Table 1. Definition of variables and data sources**

This table contains the definition of the variables used in the empirical analyses and the data sources.

| Variable | Definition | Source |
|---|---|---|
| BOOK VALUE OF LEV | Total debt / Total assets | Worldscope |
| MARKET VALUE OF LEV | Total debt / (Total assets - Book value of equity + Market capitalization) | Worldscope |
| RELDIV | Entropy index of sales, based on four-digit SIC codes | Worldscope |
| UNRELDIV | Entropy index of sales, based on two-digit SIC codes | Worldscope |
| DUMFAM | Dummy variable that equals one if the ultimate owner of the firm at the 25% control threshold is an individual or family, and zero otherwise | Amadeus |
| DUMBANK | Dummy variable that equals one if the second largest shareholder of the firm is a financial company, and zero otherwise | Amadeus |
| DUMSHMAN | Dummy variable that equals one if the ultimate owner is also the manager of the firm, and zero otherwise | Amadeus |
| PROFIT | (Operating income + Depreciations + Amortizations) / Total assets | Worldscope |
| MTB | (Total debt + Preferred capital + Market capitalization) / Total assets | Worldscope |
| TAXES | Income taxes / Pre-tax income | Worldscope |
| DEPAMTA | (Depreciations + Amortizations) / Total assets | Worldscope |
| SIZE | ln (Total assets) | Worldscope |
| TANG | (Total assets - Current assets - Intangible assets) / Total assets | Worldscope |
| BOOK VALUE OF INDLEV | Mean of book value of Lev of sector using two-digit SIC codes | Worldscope |
| MARKET VALUE OF INDLEV | Mean of market value of Lev of sector using two-digit SIC codes | Worldscope |
| LIQ | Current Assets / Current Liabilities | Worldscope |
| AT | Revenues / Total assets | Worldscope |
| INFLATION | Annual variation of CPI (consumer price index) | World Bank |
| GDPGROWTH | Annual growth of nominal GDP (gross domestic product) | World Bank |

**Table 2. Distribution of the sample by year**

This table shows the number of observations by year. Data are extracted for companies for which financial information is available for at least five consecutive years between 1999 and 2013 in the Worldscope database and ownership data are available in Amadeus.

| | Full Sample | | Non-Family Firms | | Family Firms | |
|---|---|---|---|---|---|---|
| | Observations | % | Observations | % | Observations | % |
| 1999 | 547 | 3.28 | 409 | 3.41 | 138 | 2.97 |
| 2000 | 668 | 4.01 | 497 | 4.14 | 171 | 3.68 |
| 2001 | 848 | 5.09 | 621 | 5.17 | 227 | 4.88 |
| 2002 | 1,024 | 6.15 | 751 | 6.26 | 273 | 5.87 |
| 2003 | 1,166 | 7.00 | 848 | 7.06 | 318 | 6.84 |
| 2004 | 1,252 | 7.52 | 911 | 7.59 | 341 | 7.33 |
| 2005 | 1,358 | 8.15 | 992 | 8.26 | 366 | 7.87 |
| 2006 | 1,505 | 9.04 | 1,080 | 9.00 | 425 | 9.14 |
| 2007 | 1,582 | 9.50 | 1,118 | 9.31 | 464 | 9.98 |
| 2008 | 1,610 | 9.67 | 1,138 | 9.48 | 472 | 10.15 |
| 2009 | 1,543 | 9.27 | 1,095 | 9.12 | 448 | 9.63 |
| 2010 | 1,399 | 8.40 | 994 | 8.28 | 405 | 8.71 |
| 2011 | 1,268 | 7.61 | 891 | 7.42 | 377 | 8.11 |
| 2012 | 487 | 2.92 | 362 | 3.02 | 125 | 2.69 |
| 2013 | 396 | 2.38 | 296 | 2.47 | 100 | 2.15 |
| Total | 16,653 | 100.00 | 12,003 | 100.00 | 4,650 | 100.00 |

**Table 3. Distribution of the sample by country**

This table shows the number of firms by country and the average number of observations per firm. Data are extracted for companies for which financial information is available for at least five consecutive years between 1999 and 2013 in the Worldscope database and ownership data are available in Amadeus.

| | Full Sample | | Non-Family Firms | | Family Firms | |
|---|---|---|---|---|---|---|
| | Firms | Average number of observations per firm | Firms | Average number of observations per firm | Firms | Average number of observations per firm |
| Austria | 31 | 11 | 19 | 12 | 12 | 11 |
| Belgium | 51 | 11 | 44 | 11 | 7 | 11 |
| Denmark | 51 | 9 | 44 | 9 | 7 | 8 |
| Finland | 82 | 11 | 74 | 11 | 8 | 11 |
| France | 303 | 10 | 147 | 10 | 156 | 10 |
| Germany | 267 | 9 | 170 | 9 | 97 | 9 |
| Greece | 66 | 7 | 31 | 7 | 35 | 7 |
| Ireland | 24 | 11 | 22 | 11 | 2 | 9 |
| Italy | 29 | 8 | 18 | 9 | 11 | 7 |
| Netherlands | 66 | 11 | 54 | 11 | 12 | 10 |
| Norway | 49 | 9 | 40 | 9 | 9 | 9 |
| Poland | 73 | 8 | 45 | 8 | 28 | 8 |
| Portugal | 24 | 9 | 13 | 9 | 11 | 9 |
| Spain | 62 | 10 | 49 | 10 | 13 | 9 |
| Sweden | 102 | 10 | 88 | 10 | 14 | 11 |
| Switzerland | 100 | 11 | 68 | 11 | 32 | 10 |
| Turkey | 53 | 6 | 35 | 6 | 18 | 6 |
| United Kingdom | 469 | 10 | 395 | 10 | 74 | 9 |
| Total | 1,902 | | 1,356 | | 546 | |

**Table 4. Summary statistics**

This table presents the main descriptive statistics of the dependent, firm-specific, and country-specific variables used in the analyses.

| | Mean | Std. Dev. | Minimum | Median | Maximum |
|---|---|---|---|---|---|
| BOOK VALUE OF LEV | 0.1305 | 0.1241 | 0.0000 | 0.1040 | 0.7076 |
| MARKET VALUE OF LEV | 0.1068 | 0.1098 | 0.0000 | 0.0766 | 0.7337 |
| RELDIV | 0.4539 | 0.4561 | 0.0000 | 0.3916 | 2.2182 |
| UNRELDIV | 0.3158 | 0.3770 | 0.0000 | 0.1160 | 1.8216 |
| DUMFAM | 0.2792 | 0.4486 | 0.0000 | 0.0000 | 1.0000 |
| DUMBANK | 0.2809 | 0.4495 | 0.0000 | 0.0000 | 1.0000 |
| DUMSHMAN | 0.1158 | 0.3200 | 0.0000 | 0.0000 | 1.0000 |
| PROFIT | 0.1008 | 0.1226 | -1.9251 | 0.1076 | 1.6418 |
| MTB | 1.1846 | 0.8736 | 0.0014 | 0.9187 | 6.9861 |
| TAXES | 0.2232 | 0.1829 | -0.6990 | 0.2642 | 0.7000 |
| DEPAMTA | 0.0462 | 0.0320 | 0.0000 | 0.0405 | 0.4429 |
| SIZE | 5.9157 | 2.1134 | 0.3048 | 5.7138 | 12.7458 |
| TANG | 0.3090 | 0.1853 | 0.0301 | 0.2886 | 0.7998 |
| BOOK VALUE OF INDLEV | 0.1320 | 0.0441 | 0.0000 | 0.1278 | 0.6174 |
| MARKET VALUE OF INDLEV | 0.1090 | 0.0447 | 0.0000 | 0.1043 | 0.4791 |
| LIQ | 1.8145 | 1.2946 | 0.0900 | 1.4716 | 14.8998 |
| AT | 1.2049 | 0.6956 | 0.0020 | 1.0835 | 8.9608 |
| INFLATION | 0.0213 | 0.0274 | -0.0448 | 0.0181 | 0.8464 |
| GDPGROWTH | 0.0183 | 0.0255 | -0.0854 | 0.0229 | 0.1097 |

**Table 5. Effect of the diversification strategy on the book value of debt and moderating role of family ownership**

Column (1) presents the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_1 DUMFAM_i)RELDIV_{i,t-1} + (\beta_2 + \gamma_2 DUMFAM_i)RELDIV^2_{i,t-1} + \beta_3 DUMFAM_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Column (2) shows the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_3 DUMFAM_i)UNRELDIV_{i,t-1} + (\beta_2 + \gamma_4 DUMFAM_i)UNRELDIV^2_{i,t-1} + \beta_3 DUMFAM_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. $t_1$ is the t-statistic for the linear restriction test under the null hypothesis $H_o: \beta_1 + \gamma_H = 0$; $t_2$ is the t-statistic for the linear restriction test under the null hypothesis $H_o: \beta_2 + \gamma_H = 0$; $z_1$ is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as $\chi^2$ under the null of no relation, degrees of freedom in parentheses; $z_2$ is a Wald test of the joint significance of the country dummies, asymptotically distributed as $\chi^2$ under the null of no relation, degrees of freedom in parentheses; and $z_3$ is a Wald test of the joint significance of the time dummies, asymptotically distributed as $\chi^2$ under the null of no relation, degrees of freedom in parentheses. $m_i$ 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; and Hansen is a test of the overidentifying restrictions, asymptotically distributed as $\chi^2$ under the null of no correlation between the instruments and the error term, degrees of freedom in parentheses.

| | ( 1 ) | ( 2 ) |
|---|---|---|
| $\beta_1$ $RELDIV_{i,t-1}$ | -0.0075 (0.0037)** | |
| $\beta_2$ $RELDIV^2_{i,t-1}$ | 0.0043 (0.0026) | |
| $\gamma_1$ $DUMFAM_i$ $RELDIV_{i,t-1}$ | 0.0292 (0.0059)*** | |
| $\gamma_2$ $DUMFAM_i$ $RELDIV^2_{i,t-1}$ | -0.0250 (0.0040)*** | |
| $\beta_1$ $UNRELDIV_{i,t-1}$ | | 0.0079 (0.0044)* |
| $\beta_2$ $UNRELDIV^2_{i,t-1}$ | | -0.0106 (0.0037)*** |
| $\gamma_3$ $DUMFAM_i$ $UNRELDIV_{i,t-1}$ | | 0.0144 (0.0062)** |
| $\gamma_4$ $DUMFAM_i$ $UNRELDIV^2_{i,t-1}$ | | -0.0082 (0.0049)* |
| $\beta_3$ $DUMFAM_i$ | -0.0037 (0.0024) | 0.0011 (0.0023) |
| $\beta_4$ $LEV_{i,t-1}$ | 0.6979 (0.0044)*** | 0.6989 (0.0044)*** |
| $\beta_5$ $PROFIT_{i,t-1}$ | -0.0289 (0.0032)*** | -0.0280 (0.0032)*** |
| $\beta_6$ $MTB_{i,t-1}$ | 0.0027 (0.0005)*** | 0.0020 (0.0005)*** |
| $\beta_7$ $TAXES_{i,t-1}$ | 0.0084 (0.0017)*** | 0.0093 (0.0015)*** |
| $\beta_8$ $DEPAMTA_{i,t-1}$ | -0.0712 (0.0126)*** | -0.0725 (0.0121)*** |
| $\beta_9$ $SIZE_{i,t-1}$ | 0.0066 (0.0005)*** | 0.0059 (0.0005)*** |
| $\beta_{10}$ $TANG_{i,t-1}$ | 0.0175 (0.0040)*** | 0.0194 (0.0040)*** |
| $\beta_{11}$ $INDLEV_{i,t-1}$ | 0.0480 (0.0144)*** | 0.0233 (0.0142) |
| $\beta_{12}$ $LIQ_{i,t-1}$ | -0.0061 (0.0004)*** | -0.0053 (0.0004)*** |
| $\beta_{13}$ $AT_{i,t-1}$ | -0.0073 (0.0011)*** | -0.0076 (0.0011)*** |
| $\beta_{14}$ $INFLATION_{i,t-1}$ | -0.0238 (0.0047)*** | -0.0240 (0.0045)*** |
| $\beta_{15}$ $GDPGROWTH_{i,t-1}$ | -0.0572 (0.0160)*** | -0.0763 (0.0162)*** |
| $\beta_0$ CONSTANT | 0.0218 (0.0042)*** | 0.0181 (0.0042)*** |
| $IP_{NFF}$ | | 0.3730 |
| $IP_{FF}$ | 0.5241 | 0.5955 |
| $t_1$ | 0.0217 (0.0044)*** | 0.0224 (0.0045)*** |
| $t_2$ | -0.0207 (0.0029)*** | -0.0188 (0.0033)*** |
| $z_1$ | 34898.84 (17) | 33848.98 (17) |
| $z_2$ | 173.47 (18) | 215.74 (18) |
| $z_3$ | 209.11 (13) | 254.69 (13) |
| $m_1$ | -17.11 | -17.09 |
| $m_2$ | 0.92 | 0.95 |
| Hansen | 1258.93 (1115) | 1255.68 (1115) |

**Table 6. Effect of the diversification strategy on the book value of debt among family firms: Moderating role of the second largest shareholder**

Column (1) presents the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_5 DUMBANK_i)RELDIV_{i,t-1} + (\beta_2 + \gamma_6 DUMBANK_i)RELDIV^2_{i,t-1} + \beta_3 DUMBANK_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Column (2) shows the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_7 DUMBANK_i)UNRELDIV_{i,t-1} + (\beta_2 + \gamma_8 DUMBANK_i)UNRELDIV^2_{i,t-1} + \beta_3 DUMBANK_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. For the rest of the information needed to read this table, see Table 5.

| | ( 1 ) | ( 2 ) |
|---|---|---|
| $\beta_1$ $RELDIV_{i,t-1}$ | 0.0121 (0.0027)*** | |
| $\beta_2$ $RELDIV^2_{i,t-1}$ | -0.0116 (0.0019)*** | |
| $\gamma_5$ $DUMBANK_i$ $RELDIV_{i,t-1}$ | 0.0236 (0.0041)*** | |
| $\gamma_6$ $DUMBANK_i$ $RELDIV^2_{i,t-1}$ | -0.0223 (0.0031)*** | |
| $\beta_1$ $UNRELDIV_{i,t-1}$ | | 0.0127 (0.0021)*** |
| $\beta_2$ $UNRELDIV^2_{i,t-1}$ | | -0.0081 (0.0018)*** |
| $\gamma_7$ $DUMBANK_i$ $UNRELDIV_{i,t-1}$ | | 0.0301 (0.0031)*** |
| $\gamma_8$ $DUMBANK_i$ $UNRELDIV^2_{i,t-1}$ | | -0.0029 (0.0002)*** |
| $\beta_3$ $DUMBANK_i$ | 0.0015 (0.0007)** | -0.0010 (0.0007) |
| $\beta_4$ $LEV_{i,t-1}$ | 0.7375 (0.0058)*** | 0.7263 (0.0040)*** |
| $\beta_5$ $PROFIT_{i,t-1}$ | -0.0046 (0.0037) | -0.0065 (0.0038)* |
| $\beta_6$ $MTB_{i,t-1}$ | 0.0047 (0.0004)*** | 0.0046 (0.0003)*** |
| $\beta_7$ $TAXES_{i,t-1}$ | -0.0009 (0.0011) | -0.0009 (0.0010) |
| $\beta_8$ $DEPAMTA_{i,t-1}$ | -0.0566 (0.0101)*** | -0.0520 (0.0142)*** |
| $\beta_9$ $SIZE_{i,t-1}$ | 0.0042 (0.0004)*** | 0.0040 (0.0003)*** |
| $\beta_{10}$ $TANG_{i,t-1}$ | 0.0052 (0.0031)* | 0.0114 (0.0028)*** |
| $\beta_{11}$ $INDLEV_{i,t-1}$ | 0.0815 (0.0155)*** | 0.0956 (0.0138)*** |
| $\beta_{12}$ $LIQ_{i,t-1}$ | -0.0075 (0.0003)*** | -0.0077 (0.0003)*** |
| $\beta_{13}$ $AT_{i,t-1}$ | -0.0069 (0.0007)*** | -0.0081 (0.0007)*** |
| $\beta_{14}$ $INFLATION_{i,t-1}$ | -0.0288 (0.0135)** | -0.0312 (0.0118)*** |
| $\beta_{15}$ $GDPGROWTH_{i,t-1}$ | -0.3311 (0.0201)*** | -0.3318 (0.0206)*** |
| $\beta_0$ CONSTANT | 0.0102 (0.0032)*** | 0.0117 (0.0034)*** |
| $IP_{OSS}$ | 0.5196 | 0.7783 |
| $IP_{FSS}$ | 0.5270 | 1.9426 |
| $t_1$ | 0.0357 (0.0033)*** | 0.0428 (0.0029)*** |
| $t_2$ | -0.0339 (0.0023)*** | -0.0110 (0.0017)*** |
| $z_1$ | 48002.97 (17) | 76713.50 (17) |
| $z_2$ | 1123.62 (18) | 1004.80 (18) |
| $z_3$ | 2195.09 (13) | 2118.11 (13) |
| $m_1$ | -9.01 | -8.99 |
| $m_2$ | 1.40 | 1.37 |
| Hansen | 509.18 (1115) | 496.12 (1115) |

**Table 7. Effect of the diversification strategy on the book value of debt among family firms: Moderating role of the presence of family owners in the management team**

Column (1) presents the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_9 DUMSHMAN_i)RELDIV_{i,t-1} + (\beta_2 + \gamma_{10} DUMSHMAN_i)RELDIV^2_{i,t-1} + \beta_3 DUMSHMAN_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Column (2) shows the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_{11} DUMSHMAN_i)UNRELDIV_{i,t-1} + (\beta_2 + \gamma_{12} DUMSHMAN_i)UNRELDIV^2_{i,t-1} + \beta_3 DUMBANK_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. For the rest of the information needed to read this table, see Table 5.

| | ( 1 ) | ( 2 ) |
|---|---|---|
| $\beta_1$ $RELDIV_{i,t-1}$ | 0.0133 (0.0037)*** | |
| $\beta_2$ $RELDIV^2_{i,t-1}$ | -0.0181 (0.0023)*** | |
| $\gamma_9$ $DUMSHMAN_i$ $RELDIV_{i,t-1}$ | 0.0158 (0.0048)*** | |
| $\gamma_{10}$ $DUMSHMAN_i$ $RELDIV^2_{i,t-1}$ | 0.0020 (0.0031) | |
| $\beta_1$ $UNRELDIV_{i,t-1}$ | | 0.0198 (0.0033)*** |
| $\beta_2$ $UNRELDIV^2_{i,t-1}$ | | -0.0113 (0.0027)*** |
| $\gamma_{11}$ $DUMSHMAN_i$ $UNRELDIV_{i,t-1}$ | | 0.0738 (0.0050)*** |
| $\gamma_{12}$ $DUMSHMAN_i$ $UNRELDIV^2_{i,t-1}$ | | -0.0410 (0.0041)*** |
| $\beta_3$ $DUMSHMAN_i$ | 0.0096 (0.0019)*** | 0.0164 (0.0015)*** |
| $\beta_4$ $LEV_{i,t-1}$ | 0.7236 (0.0047)*** | 0.7148 (0.0037)*** |
| $\beta_5$ $PROFIT_{i,t-1}$ | -0.0013 (0.0033) | -0.0010 (0.0033) |
| $\beta_6$ $MTB_{i,t-1}$ | 0.0044 (0.0003)*** | 0.0043 (0.0003)*** |
| $\beta_7$ $TAXES_{i,t-1}$ | -0.0008 (0.0011) | 0.0004 (0.0012) |
| $\beta_8$ $DEPAMTA_{i,t-1}$ | -0.0544 (0.0100)*** | -0.0569 (0.0101)*** |
| $\beta_9$ $SIZE_{i,t-1}$ | 0.0046 (0.0003)*** | 0.0047 (0.0004)*** |
| $\beta_{10}$ $TANG_{i,t-1}$ | 0.0082 (0.0036)** | 0.0058 (0.0032)* |
| $\beta_{11}$ $INDLEV_{i,t-1}$ | 0.0415 (0.0124)*** | -0.0013 (0.0145) |
| $\beta_{12}$ $LIQ_{i,t-1}$ | -0.0077 (0.0002)*** | -0.0074 (0.0002)*** |
| $\beta_{13}$ $AT_{i,t-1}$ | -0.0053 (0.0008)*** | -0.0049 (0.0007)*** |
| $\beta_{14}$ $INFLATION_{i,t-1}$ | -0.0422 (0.0158)*** | -0.0503 (0.0169)*** |
| $\beta_{15}$ $GDPGROWTH_{i,t-1}$ | -0.3109 (0.0235)*** | -0.3455 (0.0171)*** |
| $\beta_0$ CONSTANT | 0.0188 (0.0037)*** | 0.0210 (0.0035)*** |
| $IP_{OM}$ | 0.3686 | 0.8749 |
| $IP_{SM}$ | 0.8062 | 0.8941 |
| $t_1$ | 0.0292 (0.0026)*** | 0.0936 (0.0079)*** |
| $t_2$ | -0.0181 (0.0023)*** | -0.0523 (0.0065)*** |
| $z_1$ | 29810.28 (17) | 73980.45 (17) |
| $z_2$ | 862.82 (18) | 930.28 (18) |
| $z_3$ | 1663.56 (13) | 3281.10 (13) |
| $m_1$ | -8.95 | -8.96 |
| $m_2$ | 1.37 | 1.34 |
| Hansen | 503.72 (1115) | 508.62 (1115) |

**Table 8. Effect of the diversification strategy on the market value of debt and moderating role of family ownership**

Column (1) presents the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_1 DUMFAM_i)RELDIV_{i,t-1} + (\beta_2 + \gamma_2 DUMFAM_i)RELDIV^2_{i,t-1} + \beta_3 DUMFAM_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Column (2) shows the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_3 DUMFAM_i)UNRELDIV_{i,t-1} + (\beta_2 + \gamma_4 DUMFAM_i)UNRELDIV^2_{i,t-1} + \beta_3 DUMFAM_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. For the rest of the information needed to read this table, see Table 5.

| | ( 1 ) | ( 2 ) |
|---|---|---|
| $\beta_1$ $RELDIV_{i,t-1}$ | -0.0061 (0.0031)** | |
| $\beta_2$ $RELDIV^2_{i,t-1}$ | 0.0016 (0.0023) | |
| $\gamma_1$ $DUMFAM_i$ $RELDIV_{i,t-1}$ | 0.0363 (0.0055)*** | |
| $\gamma_2$ $DUMFAM_i$ $RELDIV^2_{i,t-1}$ | -0.0214 (0.0038)*** | |
| $\beta_1$ $UNRELDIV_{i,t-1}$ | | 0.0083 (0.0036)** |
| $\beta_2$ $UNRELDIV^2_{i,t-1}$ | | -0.0114 (0.0030)*** |
| $\gamma_3$ $DUMFAM_i$ $UNRELDIV_{i,t-1}$ | | 0.0247 (0.0053)*** |
| $\gamma_4$ $DUMFAM_i$ $UNRELDIV^2_{i,t-1}$ | | -0.0093 (0.0042)** |
| $\beta_3$ $DUMFAM_i$ | 0.0050 (0.0021)** | 0.0003 (0.0021) |
| $\beta_4$ $LEV_{i,t-1}$ | 0.6637 (0.0045)*** | 0.6638 (0.0043)*** |
| $\beta_5$ $PROFIT_{i,t-1}$ | -0.0237 (0.0031)*** | -0.0230 (0.0030)*** |
| $\beta_6$ $MTB_{i,t-1}$ | -0.0021 (0.0004)*** | -0.0021 (0.0004)*** |
| $\beta_7$ $TAXES_{i,t-1}$ | 0.0081 (0.0014)*** | 0.0090 (0.0014)*** |
| $\beta_8$ $DEPAMTA_{i,t-1}$ | -0.0719 (0.0122)*** | -0.0749 (0.0120)*** |
| $\beta_9$ $SIZE_{i,t-1}$ | 0.0060 (0.0004)*** | 0.0053 (0.0004)*** |
| $\beta_{10}$ $TANG_{i,t-1}$ | 0.0217 (0.0036)*** | 0.0245 (0.0035)*** |
| $\beta_{11}$ $INDLEV_{i,t-1}$ | -0.0329 (0.0121)*** | -0.0310 (0.0119)*** |
| $\beta_{12}$ $LIQ_{i,t-1}$ | -0.0062 (0.0003)*** | -0.0059 (0.0003)*** |
| $\beta_{13}$ $AT_{i,t-1}$ | -0.0086 (0.0010)*** | -0.0091 (0.0010)*** |
| $\beta_{14}$ $INFLATION_{i,t-1}$ | 0.0437 (0.0040)*** | 0.0443 (0.0038)*** |
| $\beta_{15}$ $GDPGROWTH_{i,t-1}$ | 0.0431 (0.0139)*** | 0.0621 (0.0137)*** |
| $\beta_0$ CONSTANT | 0.0291 (0.0035)*** | 0.0266 (0.0034)*** |
| $IP_{NFF}$ | | 0.3638 |
| $IP_{FF}$ | 0.7610 | 0.7946 |
| $t_1$ | 0.0301 (0.0042)*** | 0.0330 (0.0040)*** |
| $t_2$ | -0.0198 (0.0029)*** | -0.0208 (0.0030)*** |
| $z_1$ | 35835.46 (17) | 35610.61 (17) |
| $z_2$ | 235.51 (18) | 249.83 (18) |
| $z_3$ | 2180.79 (13) | 2236.94 (13) |
| $m_1$ | -15.80 | -15.78 |
| $m_2$ | 0.34 | 0.35 |
| Hansen | 1326.70 (1115) | 1357.75 (1115) |

**Table 9. Effect of the diversification strategy on the market value of debt among family firms: Moderating role of the second largest shareholder**

Column (1) presents the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_5 DUMBANK_i)RELDIV_{i,t-1} + (\beta_2 + \gamma_6 DUMBANK_i)RELDIV^2_{i,t-1} + \beta_3 DUMBANK_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Column (2) shows the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_7 DUMBANK_i)UNRELDIV_{i,t-1} + (\beta_2 + \gamma_8 DUMBANK_i)UNRELDIV^2_{i,t-1} + \beta_3 DUMBANK_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. For the rest of the information needed to read this table, see Table 5.

| | ( 1 ) | ( 2 ) |
|---|---|---|
| $\beta_1$ $RELDIV_{i,t-1}$ | 0.0205 (0.0034)*** | |
| $\beta_2$ $RELDIV^2_{i,t-1}$ | -0.0205 (0.0024)*** | |
| $\gamma_5$ $DUMBANK_i$ $RELDIV_{i,t-1}$ | 0.0284 (0.0049)*** | |
| $\gamma_6$ $DUMBANK_i$ $RELDIV^2_{i,t-1}$ | -0.0194 (0.0035)*** | |
| $\beta_1$ $UNRELDIV_{i,t-1}$ | | 0.0207 (0.0028)*** |
| $\beta_2$ $UNRELDIV^2_{i,t-1}$ | | -0.0147 (0.0021)*** |
| $\gamma_7$ $DUMBANK_i$ $UNRELDIV_{i,t-1}$ | | 0.0294 (0.0033)*** |
| $\gamma_8$ $DUMBANK_i$ $UNRELDIV^2_{i,t-1}$ | | -0.0025 (0.0003)*** |
| $\beta_3$ $DUMBANK_i$ | 0.0066 (0.001)*** | 0.004 (0.0005)*** |
| $\beta_4$ $LEV_{i,t-1}$ | 0.7188 (0.0057)*** | 0.6969 (0.0052)*** |
| $\beta_5$ $PROFIT_{i,t-1}$ | -0.0064 (0.0044) | -0.0137 (0.0028)*** |
| $\beta_6$ $MTB_{i,t-1}$ | 0.0183 (0.0005)*** | 0.0009 (0.0003)*** |
| $\beta_7$ $TAXES_{i,t-1}$ | -0.0022 (0.0013)* | 0.0005 (0.0011) |
| $\beta_8$ $DEPAMTA_{i,t-1}$ | -0.032 (0.0126)** | -0.107 (0.0135)*** |
| $\beta_9$ $SIZE_{i,t-1}$ | 0.008 (0.0004)*** | 0.0029 (0.0003)*** |
| $\beta_{10}$ $TANG_{i,t-1}$ | -0.0021 (0.0031) | 0.0139 (0.0028)*** |
| $\beta_{11}$ $INDLEV_{i,t-1}$ | 0.0141 (0.0144) | 0.0712 (0.0140)*** |
| $\beta_{12}$ $LIQ_{i,t-1}$ | -0.0071 (0.0003)*** | -0.0069 (0.0003)*** |
| $\beta_{13}$ $AT_{i,t-1}$ | -0.0082 (0.0008)*** | -0.0101 (0.0006)*** |
| $\beta_{14}$ $INFLATION_{i,t-1}$ | -0.0831 (0.0167)*** | -0.0347 (0.0132)*** |
| $\beta_{15}$ $GDPGROWTH_{i,t-1}$ | 0.3692 (0.0229)*** | 0.2553 (0.0229)*** |
| $\beta_0$ CONSTANT | 0.0006 (0.0033) | 0.0275 (0.0026)*** |
| $IP_{OSS}$ | 0.4992 | 0.7067 |
| $IP_{FSS}$ | 0.6126 | 1.4585 |
| $t_1$ | 0.0489 (0.0041)*** | 0.0501 (0.0029)*** |
| $t_2$ | -0.0399 (0.0027)*** | -0.0172 (0.0019)*** |
| $z_1$ | 29192.25 (17) | 49055.15 (17) |
| $z_2$ | 1147.27 (18) | 770.23 (18) |
| $z_3$ | 2817.47 (13) | 6213.11 (13) |
| $m_1$ | -8.63 | -8.46 |
| $m_2$ | 0.82 | 0.1 |
| Hansen | 498.73 (1115) | 506.41 (1115) |

**Table 10. Effect of the diversification strategy on the market value of debt among family firms: Moderating role of the presence of family owners in the management team**

Column (1) presents the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_9 DUMSHMAN_i)RELDIV_{i,t-1} + (\beta_2 + \gamma_{10} DUMSHMAN_i)RELDIV^2_{i,t-1} + \beta_3 DUMSHMAN_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Column (2) shows the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_{11} DUMSHMAN_i)UNRELDIV_{i,t-1} + (\beta_2 + \gamma_{12} DUMSHMAN_i)UNRELDIV^2_{i,t-1} + \beta_3 DUMBANK_i + \beta_F F_{i,t-1} + \beta_C C_{j,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. For the rest of the information needed to read this table, see Table 5.

| | ( 1 ) | ( 2 ) |
|---|---|---|
| $\beta_1$ $RELDIV_{i,t-1}$ | 0.0106 (0.0038)*** | |
| $\beta_2$ $RELDIV^2_{i,t-1}$ | -0.0127 (0.0022)*** | |
| $\gamma_9$ $DUMSHMAN_i$ $RELDIV_{i,t-1}$ | 0.0270 (0.0057)*** | |
| $\gamma_{10}$ $DUMSHMAN_i$ $RELDIV^2_{i,t-1}$ | -0.0093 (0.0037)** | |
| $\beta_1$ $UNRELDIV_{i,t-1}$ | | 0.0160 (0.0039)*** |
| $\beta_2$ $UNRELDIV^2_{i,t-1}$ | | -0.0059 (0.0030)* |
| $\gamma_{11}$ $DUMSHMAN_i$ $UNRELDIV_{i,t-1}$ | | 0.0675 (0.0047)*** |
| $\gamma_{12}$ $DUMSHMAN_i$ $UNRELDIV^2_{i,t-1}$ | | -0.0385 (0.0039)*** |
| $\beta_3$ $DUMSHMAN_i$ | 0.0049 (0.0020)** | 0.0145 (0.0017)*** |
| $\beta_4$ $LEV_{i,t-1}$ | 0.5870 (0.0050)*** | 0.7149 (0.0041)*** |
| $\beta_5$ $PROFIT_{i,t-1}$ | -0.0140 (0.0032)*** | -0.0054 (0.0031)* |
| $\beta_6$ $MTB_{i,t-1}$ | -0.0136 (0.0003)*** | 0.0040 (0.0003)*** |
| $\beta_7$ $TAXES_{i,t-1}$ | -0.0007 (0.0012) | -0.0001 (0.0011) |
| $\beta_8$ $DEPAMTA_{i,t-1}$ | -0.1084 (0.0125)*** | -0.0633 (0.0087)*** |
| $\beta_9$ $SIZE_{i,t-1}$ | 0.0047 (0.0004)*** | 0.0055 (0.0004)*** |
| $\beta_{10}$ $TANG_{i,t-1}$ | 0.0325 (0.0038)*** | 0.0035 (0.0033) |
| $\beta_{11}$ $INDLEV_{i,t-1}$ | 0.0852 (0.0156)*** | 0.0026 (0.0163) |
| $\beta_{12}$ $LIQ_{i,t-1}$ | -0.0054 (0.0003)*** | -0.0069 (0.0002)*** |
| $\beta_{13}$ $AT_{i,t-1}$ | -0.0042 (0.0007)*** | -0.0037 (0.0007)*** |
| $\beta_{14}$ $INFLATION_{i,t-1}$ | -0.0117 (0.0150) | -0.0504 (0.0170)*** |
| $\beta_{15}$ $GDPGROWTH_{i,t-1}$ | 0.3189 (0.0216)*** | 0.3369 (0.0187)*** |
| $\beta_0$ CONSTANT | 0.0148 (0.0041)*** | 0.0149 (0.0029)*** |
| $IP_{OM}$ | 0.4194 | 1.3460 |
| $IP_{SM}$ | 0.8555 | 7.0429 |
| $t_1$ | 0.0377 (0.0041)*** | 0.0835 (0.0081)*** |
| $t_2$ | -0.0220 (0.0027)*** | -0.0444 (0.0066)*** |
| $z_1$ | 29462.71 (17) | 61341.74 (17) |
| $z_2$ | 1065.40 (18) | 878.49 (18) |
| $z_3$ | 6021.75 (13) | 2738.07 (13) |
| $m_1$ | -8.79 | -8.97 |
| $m_2$ | -0.38 | 1.34 |
| Hansen | 510.27 (1115) | 497.85 (1115) |