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Macroeconomic and strategic determinants of corporate capital structure. The moderating effect of institutional factors, banking system characteristics and a firm's ownership structure

Author

D. Juan Camilo Rivera Ordóñez

Supervisors

Dr. Julio Pindado García & Dr. Ignacio Requejo Puerto

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UNIVERSIDAD DE SALAMANCA
Departamento de Administración y
Economía de la Empresa

FACULTAD DE ECONOMÍA Y EMPRESA
Campus "Miguel de Unamuno"
37007 SALAMANCA (SPAIN)
Tel.: +34 923 294 640 Ext. 3506
Fax: +34 923 294 715

D. Julio Pindado García, Catedrático de Economía Financiera, y D. Ignacio Requejo Puerto, Profesor Ayudante Doctor de Economía Financiera

CERTIFICAN

Que la presente tesis doctoral, que lleva por título *"Macroeconomic and strategic determinants of corporate capital structure. The moderating effect of institutional factors, banking system characteristics and a firm's ownership structure"* y que presenta D. Juan Camilo Rivera Ordóñez para optar al grado de Doctor por la Universidad de Salamanca, ha sido realizada bajo su dirección en el Departamento de Administración y Economía de la Empresa de la Universidad de Salamanca y que cumple todos los requisitos necesarios para proceder a su defensa pública.

Y para que así conste y surta los efectos oportunos, se expide el presente certificado en Salamanca a 10 de julio de 2017.

Dr. Julio Pindado García
Universidad de Salamanca

Dr. Ignacio Requejo Puerto
Universidad de Salamanca

To my wife, my family and my supervisors

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Juan Camilo Rivera Ordóñez

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Table of Contents

List of Figures and Tables

Chapter I

Introduction

In this chapter, we present our subject of study, capital structure determinants, and a review of previous related literature, as well as the motivations that lead us to extent and improve on prior research. First of all, we present the main arguments to explore external and internal determinants of firm leverage. Regarding external determinants of corporate capital structure, we conduct an in-depth analysis of how macroeconomic and institutional characteristics, at the country-level, shape capital structure. Specifically, On the one hand, we present empirical evidence about the effects of the expected performance of the economy and country institutional characteristics related with the lending process on corporate debt decisions. On the other hand, we advance previous research about the influence of monetary policy measures and features of the banking system on corporate leverage.

With regard to capital structure determinants at the firm-level, we present previous literature regarding how firm strategy affects capital structure. Specifically, we focus on the diversification decision and how it can affect corporate leverage, depending on corporate governance characteristics of the company.

Finally, we present the main objectives that we aim to achieve in the following chapters and formulate the thesis to be defended in the present dissertation.

I.1. Economic forecast and institutional environment

Despite the great attention attracted by firm indebtedness decisions, recent empirical evidence shows that many questions on how capital structure is formed remain to be answered (Graham et al., 2015). Some determinants of firm debt decisions, such as macroeconomic and institutional factors, have been underestimated in previous literature given the high attention that firm-level characteristics have traditionally received.

It is generally accepted that macroeconomic expectations affect corporate leverage positively (Frank & Goyal, 2009) due to the pro-cyclical value of firm collateral. However, it is not clear how the risks that emerge at each stage of the lending process moderate the relation between the expected performance of the economy and a firm's capital structure.

In this regard, it is important to note that any financing process involves two parties (i.e., the lender and the borrower) and, as a consequence, asymmetric information problems need to be considered (Myers, 1984; Flannery, 1986; Narayanan, 1988). These asymmetries hinder the access to external financing and lead to higher costs of debt (Myers, 1984; Myers & Majluf, 1984; Healy & Palepu, 2001; Hughes et al., 2007; Cassar et al., 2015). However, the severity of such problems varies over the different stages of the financing process, with better ex-ante and ex-post conditions facilitating firms' access to external sources of funds.

It is possible to differentiate three stages in the lending process, each one associated with exposure to different risks. The first stage, which we call the lending decision stage, takes place before the creditor provides funds to the company and is characterized by the adverse selection risk. The second stage, the indebtedness stage, begins when the borrower (i.e., the company) receives the funds from the creditor and finishes just before the debt is classified as a nonperforming loan. During this stage, moral hazard is the main risk. The last

stage, called the default stage, starts when the firm is unable to honor its commitments and the loans received previously are considered nonperforming. As the name of the stage implies, the main risk is the default risk.

With regard to the lending decision stage, empirical studies reveal that eliminating informational opacity on the financial situation of borrowers leads to an increase in the amount of credit available (Strahan & Weston, 1998; Detragiache et al., 2000; Rauch & Hendrickson, 2004; Hyytinen & Väänänen, 2006; Hernandez-Canovas & Martinez-Solano, 2007). Specifically, when lenders have more information about borrowers, they provide more credit (Padilla & Pagano, 1997; 2000; Baas & Schrooten, 2006; Djankov et al., 2007; Brown et al., 2009; Houston et al., 2010) because they are less concerned about the risk of financing unprofitable projects (Jaffee & Russell, 1976; Stiglitz & Weiss, 1981). Therefore, higher transparency on the financial situation of potential borrowers helps to reduce information asymmetries and transaction costs, thus reducing credit rationing problems (Rauch & Hendrickson, 2004).

The indebtedness stage is affected by distress costs (i.e., moral hazard). However, it is necessary to separate these costs into ex-ante and ex-post costs of distress. On the one hand, regarding the first type of distress costs, previous literature shows that the likelihood that creditors are expropriated by shareholders is lower in contexts where creditors are well protected (Gungoraydinoglu & Öztekin, 2011), leading to an increase in private credit volume over GDP (Fauceglia, 2015). In addition, Huang & Shen (2015) find that firms adjust faster their leverage ratios to the target in countries with stronger legal protection. Meanwhile, Demirgüç-Kunt & Maksimovic (1999), Giannetti (2003), and González & González (2008; 2014) point out that protecting creditor rights facilitates the access to long-

term debt. On the other hand, regarding ex-post distress costs, Gungoraydinoglu & Öztekin (2011) point out that more efficient bankruptcy regulation reduces ex-post financial distress costs, which would have a positive effect on the access to corporate leverage. This is consistent with evidence that reveals how insolvency costs negatively affect long-term debt (Pindado et al., 2006).

With respect to the last stage of the lending process, the risk of default has a negative impact on credit. When lenders face large unexpected losses, such as those caused by nonperforming loans, firms have to deal with a contraction in bank credit. This situation occurs because lenders reduce their credit portfolio with the aim of complying with capital requirements (Brummermeier, 2009).

Given this scenario, our objective is to investigate whether the institutional framework, by either mitigating or exacerbating the risks inherent in the lending process, could indirectly influence capital structure by shaping the relation between economic forecasts and firm leverage.

I.2. Monetary policy measures and banking system characteristics

Although most literature supports a positive effect of the monetary policy on debt (Berger & Udell, 1998; Gertler & Gilchrist, 1993; Gertler & Gilchrist, 1994), Cooley & Quadrini (2006) suggest the possibility of a non-linear relation between increases in money supply and corporate debt.

Due to the different theoretical perspectives on the consequences of an expansionary monetary policy, there is still no consensus among economists about the effects of an increase in the amount of money. On the one hand, the Federal Reserve and the Bank of

England follow the orthodox approach and consider that inflation is determined by the Phillips Curve as a function of current output against its potential level (Lothian, 2014). From this perspective, the amount of money in the economy is irrelevant for inflation since this should not increase if output is below its potential level and under the assumption that inflation expectations remain constant.

On the other hand, there is another school of thought led by the European Central Bank which considers that an increase in the amount of money entails the risk of a sharp increase in inflation, unless this policy is reversed by subsequent contractionary measures (Lothian, 2014). This approach is supported by previous studies that state that in the long run high rates of money growth result in high inflation rates, because in the long term the Phillips Curve is vertical or positive sloping instead of downward sloping (Fischer & Sahay, 2002; Haug & Dewald, 2012; Lothian, 1985; Lothian & McCarthy, 2009).

Concerning the role of banking system characteristics, Tan, Yao, & Wei (2015) highlight that in bank-based systems firms are more vulnerable to liquidity shocks compared to companies that operate in market-based systems. In this regard, Massa & Zhang (2013) find that debt inflexibility facilitates the transmission of monetary policy measures, because when companies face difficulties to access the bond market, firms' dependence on banks increases. In this line of reasoning, Kwapil & Scharler (2013) find that the monetary policy is becoming more predictable and credible, because the role that banks play to transmit monetary expansions to the real economy has recently become more important. However, although the banking system is essential in the transmission of monetary policy measures and in the influence of such measures on corporate leverage, we need to consider banks' liquidity and the allocation of banks' loan portfolios separately.

First, we focus on banks' liquidity. Bassett et al. (2014) argue that banks with higher liquidity can better absorb monetary shocks and therefore they do not need to tighten their lending standards or, if they need to tighten the conditions, at least they can do it gradually during periods of financial turmoil. This is consistent with the idea that a high ratio of liquid assets is among the factors related with banks' financial structure that are likely to reduce the efficiency of monetary policy measures (Ramos-Tallada, 2015).

Second, we focus on the allocation of banks' portfolios. Graham et al. (2015) find a negative relation between corporate leverage and government leverage. Their evidence reveals that, when governments reduce their debt issues, companies increase their use of debt relative to equity, resulting in an increase in corporate leverage. Becker & Ivashina (2014) find that contractionary monetary policy measures often lead firms to explore new financing alternatives for raising funds. A common alternative is switching from bank loans to bond issues. However, in environments where the loan portfolio is usually concentrated on private credits, the bond market is likely to be dominated by public debt because governments and other public authorities get fewer resources from the banking sector.

Consequently, there is a need for more comprehensive understanding on how monetary policy measures affect corporate leverage in an international context, and how the intensity of this effect is moderated by bank system characteristics, such as banks' liquidity and the allocation of banks' portfolios.

I.3. Diversification strategy and family ownership

Finally, we focus on the importance of corporate strategy, specifically the diversification decision, for capital structure (Barton & Gordon, 1987). In this respect, it is

important to delimit the scope of the previously mentioned strategy. Most previous research concerning a firm's 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) study the effect of product diversification on corporate debt. Meanwhile, the remaining works focus on the international diversification strategy. Interestingly, from all works previously mentioned, Kochhar & Hitt (1998), La Rocca, La Rocca, Gerace & Smark, 2009 and (Ngah-Kiing Lim, Das & Das, 2009) are the only ones that differentiate between related and unrelated diversification strategies.

In addition, a firm's ownership structure also deserves special attention. In this regard, is important to consider how family ownership affects diversification strategies. On the one hand, diversification reduces volatility in earnings by providing greater financial security to the family (Faccio, Lang & Young, 2001), which increases the incentives to adopt this strategy. Conversely, on the other hand, there is also evidence that family firms diversify less than non-family firms (Gómez-Mejía, Makri, & Kintana, 2010) in order to preserve non-economic wealth of the family.

In this line of reasoning, corporate strategy and the moderating role of family control in the relation between diversification strategies and capital structure decisions constitute an interesting research topic. This is particularly true if we explore the problem mentioned

above in an international context. By doing so, we could provide additional evidence that enables us to disentangle the link between corporate strategy and capital structure.

I.4. Objectives and formulation of the thesis

Considering previous literature regarding the effect of macroeconomic and institutional characteristics (at the country-level), and corporate strategy (at the firm-level) on capital structure, our main objective in the present dissertation is to disentangle whether indebtedness decisions differ across macroeconomic contexts. Contexts vary depending on the expected performance of the economy, the institutional characteristics related with the risks that exist in the lending process, the monetary policy in different bank dependence environments, and the diversification strategy in family and non-family firms.

To achieve our objective, the present document is divided in four chapters. In Chapter II, we analyze the effect of the expected performance of the economy on corporate leverage. To do so, we introduce in the analyses the risk that exists at each stage of the lending process and how country-level characteristics moderate the relation between the expected performance of the economy and firm debt. The empirical evidence presented in this chapter is based on a broad international sample that covers 35 developed and developing countries.

Then, in Chapter III, we examine whether monetary policy measures shape firm debt using a broad international sample that comprises 37 developed and developing countries. We also investigate how the effect of an increase in the amount of money on corporate leverage could be moderated by banking sector specific characteristics, such as banks' liquidity and the allocation of banks' loan portfolios. In addition, we also explore the possibility of nonlinear effects.

In Chapter IV, we investigate the effect of corporate strategy on firm indebtedness decisions in 18 European countries. Specifically, we study how diversification strategies (i.e., related and unrelated diversification) affect capital structure choices in different types of firms according to their ownership structure (i.e., family and non-family firms). Finally, the last chapter of the study, Chapter V, presents our main conclusions based on the findings obtained throughout the dissertation, which allow us to defend our:

Thesis: *"Capital structure choices are determined by macroeconomic conditions (at the country-level) and strategic decisions (at the firm-level), and the relations between them are moderated by country-level institutional and banking sector factors, and by firm-level ownership and governance characteristics"*.

Chapter II

Economic forecast and corporate leverage choices

II.1. Introduction

Although corporate capital structure has been the subject of numerous studies (Rajan & Zingales, 1995; De Jong et al., 2008; Frank & Goyal, 2009; Bhamra et al., 2010; Chen, 2010; Öztekin & Flannery, 2012), it is still a topic of particular interest among finance researchers and economists due to its implications for business practice and for the economy as a whole (Chang et al., 2015; An et al., 2016; Antzoulatos et al., 2016; Keefe & Yaghoubi, 2016). Despite the great attention attracted by this topic, recent empirical evidence shows that many questions on how capital structure is formed remain to be answered (Graham et al., 2015). Some determinants of firm debt decisions, such as institutional factors, have been underestimated in previous literature. In this regard, Graham et al., who investigate the evolution of corporate debt in the United States over the last century, highlight some interesting facts. One of their most remarkable findings is that firm-level characteristics traditionally considered in capital structure research are unable to fully explain changes in firm leverage.

One conclusion that can be derived from Graham et al.'s (2015) work is the potential misspecification of capital structure models estimated in prior literature. In addition to the possibility that previous studies may have omitted relevant firm-level explanatory variables,

these authors point out that country-level factors, such as macroeconomic and institutional ones, have not received the attention they deserve. Thus far, most literature in the capital structure field has focused on firm-level characteristics. Erel et al. (2012) reinforce the need to consider factors beyond the borders of the business when analyzing corporate capital structure by showing that the ability of firms to raise capital depends on the macroeconomic context. Therefore, in the current context of economic uncertainty and credit rationing, investigating how environmental conditions affect firm debt decisions is relevant and timely, as anecdotal evidence also suggests (McCrum & Jackson, 2016).

Additionally, it is important to note that any financing process involves two parties (i.e., the lender and the borrower) and, as a consequence, asymmetric information problems need to be considered (Myers, 1984; Flannery, 1986; Narayanan, 1988). Overall, information asymmetries hinder the access to external financing and lead to higher costs of debt (Myers, 1984; Myers & Majluf, 1984; Healy & Palepu, 2001; Hughes et al., 2007; Cassar et al., 2015). However, the severity of such problems varies over the different stages of the financing process, with better ex-ante and ex-post conditions facilitating firms' access to external sources of funds. In this sense, some particular features of the institutional environment, such as the availability of credit information of higher quality and the existence of more protective regulation for both debtors and creditors, among others, may mitigate asymmetric information problems (Houston et al., 2010; Li & Ferreira, 2011; González & González, 2014; Fauceglia, 2015; Leon, 2015; Love & Pería, 2015). Therefore, these characteristics are likely to play an important role in the lending process and should be considered to better understand how capital structure decisions are made.

In this context, our objective is to investigate how the expected performance of the economy, which is an important factor of the macroeconomic environment, affects corporate capital structure. In addition, we examine the direct effect of country-specific characteristics related with lending risks on firm debt. Going a step further, we also analyze the joint effects of these characteristics and a country's economic expectations on a firm's capital structure. That is, we study whether the institutional framework, by either mitigating or exacerbating the risks inherent in the lending process, could indirectly influence capital structure by shaping the relation between economic forecast and firm leverage.

To achieve our objective, we use an international sample that includes developed and emerging economies that exhibit different growth prospects between each other and over time. Moreover, the countries considered in the study differ from each other in their regulation of the relationships between borrowers and lenders. We have carefully chosen the estimation method used in the regression analyses. Although information about expectations is equally available to all managers, each of them understands and reacts differently to the macroeconomic context and to economic growth forecasts, depending on factors unobservable to the researcher. Therefore, we control for unobservable heterogeneity by using a panel data method that accounts for such individual effects. The panel data methodology also enables us to alleviate the omitted variable bias (Michaelas et al., 1999), which is a noteworthy advantage of our estimation method given that manager-specific characteristics could partly explain corporate investment and financing decisions (Bertrand & Schoar, 2003).

Our empirical evidence suggests that higher availability and better quality of credit information on borrowers as well as stronger protection of the rights of lenders and

borrowers have a positive direct effect on firm debt. Moreover, these two country-level factors can be powerful ex-ante conditions that help to mitigate the impact of poor economic expectations on corporate leverage. Conversely, higher costs of insolvency and default risks have a negative direct effect on a firm's level of debt. In countries where these ex-post problems are more severe, corporate debt is more sensitive to and reliant on the expected performance of the economy.

We contribute to the economics and finance literature in several ways. First, we advance prior research on the effect of institutional factors (Antoniou et al., 2008; Fan et al., 2012; Öztekin, 2015) and macroeconomic characteristics (Hackbarth et al., 2006; Chen, 2010; Cook & Tang, 2010; Erel et al., 2012) on corporate capital structure. Unlike previous related literature, we focus on the ex-ante and ex-post risks associated with the asymmetric information problems that characterize lending relationships. Our study highlights that a firm's capital structure depends on the extent to which country-level institutions can alleviate the risks that arise at each stage of the lending process. Therefore, to better understand corporate financing decisions, it is necessary to consider the overall institutional framework in which companies operate. Previous studies usually focus on factors associated with single stages of the lending process, such as for example the lending decision or the insolvency phase (Öztekin, 2015).

Second, we not only investigate the direct impact of economic growth forecasts and country-level factors related with the lending decision on firm leverage (Shleifer & Vishny, 1992; Kiyotaki & Moore, 1997; Levy & Hennessy, 2007; Frank & Goyal, 2009), but also explore the possibility of indirect effects. In particular, we analyze how the institutions and regulations that affect the severity of asymmetric information problems (i.e., availability and

quality of credit information, legal protection of lenders and borrowers, time to resolve insolvency, and the amount of nonperforming loans) moderate the effect of macroeconomic expectations on corporate leverage. In this regard, we provide new empirical evidence on the joint impact of macroeconomic and institutional factors on firm debt and improve on prior related research (Jõeveer, 2013; Huang & Shen, 2015) by using in our analyses time-varying measures of the country-specific characteristics examined.

Third, the use of the panel data methodology enables us to control for unobservable heterogeneity, which is a problem that affects most economics and finance models (Wintoki et al., 2012; Flannery & Hankins, 2013; Pindado et al., 2015). We could obtain biased results if we did not take into consideration this econometrical problem. Accounting for unobservable heterogeneity is a noteworthy methodological contribution because, although in our models we include several macroeconomic and institutional factors that improve on previous empirical specifications, 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. The individual effect is then removed in the estimation process, thus helping us to mitigate the risk of obtaining biased results.

Finally, it is also worth noting that we extend the geographical coverage of previous related studies (Korajczyk & Levy, 2003; Frank & Goyal, 2009; Erel et al., 2012). Although some previous studies also use cross-country samples for the analysis of capital structure decisions (González & González, 2008; Öztekin & Flannery, 2012; Öztekin, 2015), none of them focuses on the effect of macroeconomic conditions on firm debt. Our broad

international sample comprises both developed and emerging countries, as well of bank and market-based economies. One of the main advantages of the broad sample coverage is to obtain higher variability in the country-level factors, which are at the center of the study. This, in turn, enables us to obtain more robust results that can be more easily generalized to other geographical regions.

The remainder of the study is organized as follows. Section 2 reviews previous literature concerning the impact of macroeconomic conditions and factors that influence the risks that exist in the lending process on financing decisions and develops the testable hypotheses. The data, variables, and estimation method are described in Section 3. Sections 4 and 5 present the results and the robustness tests, respectively. Section 6 summarizes the main results and concludes.

II.2. Theory and hypothesis development

II.2.1. Effect of the expected performance of the economy on corporate debt

The impact of macroeconomic factors on firms' debt decisions has been widely studied in recent years. Some prior research related to this topic proposes a number of theoretical models that, to the best of our knowledge, have not been tested empirically in an international context (Stiglitz & Weiss, 1981; Levy & Hennessy, 2007; Bhamra et al., 2010; Chen, 2010; Arnold et al., 2013). Among the empirical works that analyze the effect of macroeconomic variables on corporate debt, the vast majority focuses on developed nations (Berger & Udell, 1998; Korajczyk & Levy, 2003; Frank & Goyal, 2009; Erel et al., 2012) and presents no concluding results beyond this type of economy.

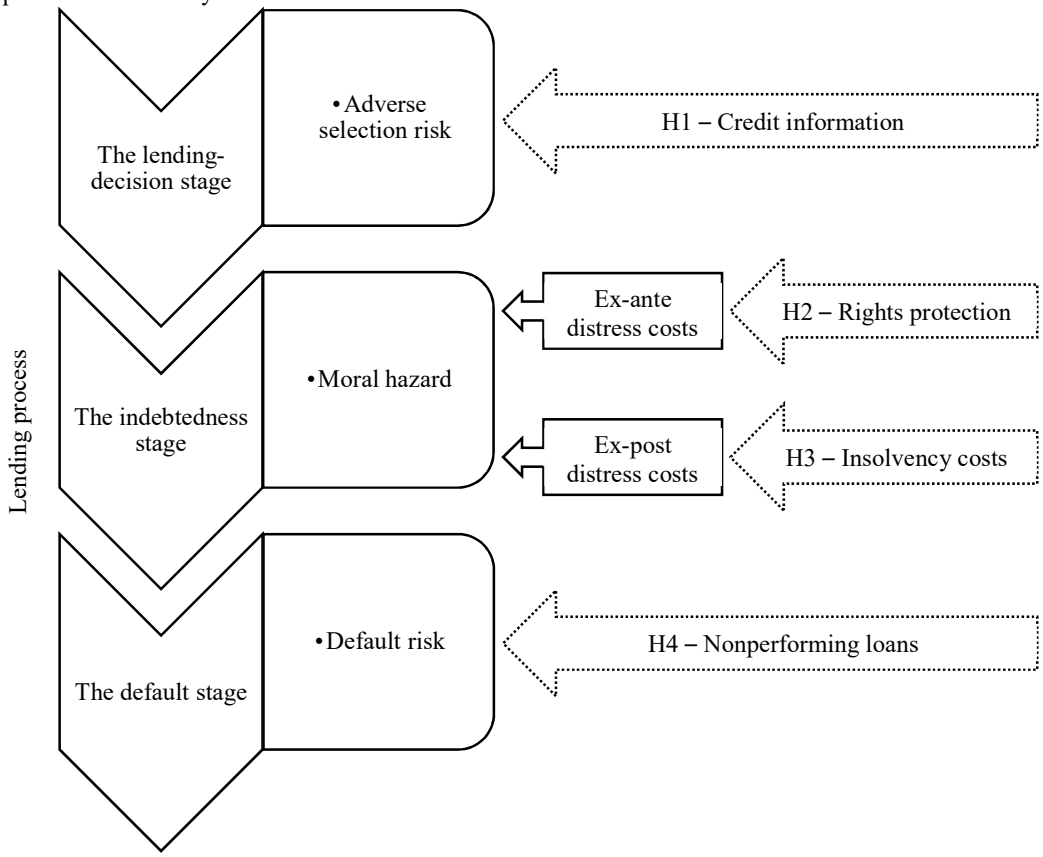
With respect to economic expectations, Frank & Goyal (2009), who investigate the most relevant determinants of a firm's capital structure decisions, provide some of the most generally accepted findings on the relation between the expected performance of the economy and debt. Their empirical results show that during economic expansions stock prices go up, expected bankruptcy costs go down, taxable income goes up, cash increases, and firms borrow more. Because collateral values are likely to be pro-cyclical and firms borrow against collateral, leverage should be pro-cyclical. Likewise, Kiyotaki & Moore (1997) predict that pro-cyclical collateral values result in pro-cyclical leverage patterns. Along the same line, Levy & Hennessy (2007) find that firms issue more debt during expansions, which is consistent with the idea that firm debt capacity depends on economic conditions and that their ability to borrow increases during booms (Shleifer & Vishny, 1992). Another reason to expect pro-cyclical leverage patterns is that, in periods of high economic growth rates, corporate taxable income rises and, in line with the trade-off prediction, companies look for tax shields by increasing their debt levels.

II.2.2. Existing risks in the lending process

As previously highlighted, most economics and finance works that analyze the impact of macroeconomic factors on firm debt pay special attention to developed economies. However, based on prior research (Demirgüç-Kunt & Maksimovic, 1999; De Jong et al., 2008; Fan et al., 2012; Jõeveer, 2013), country-specific factors, such as those that affect the severity of information asymmetries inherent in the lending process, are likely to moderate the relations previously documented.

The pecking order theory highlights firms' preferences for internal funds over risky securities such as debt because of the asymmetric information costs that exist in exchanges between lenders and borrowers (Myers, 1984; Myers & Majluf, 1984). As illustrated in Figure 1, it is possible to differentiate three stages in the lending process depending on the risks due to asymmetric information problems.

Figure II.1. Stages of the lending process
This figure illustrates the different stages of the lending process depending on the risks that exist due to asymmetric information problems. The dotted arrows denote country-level institutional characteristics that we expect to moderate the effect of macroeconomic expectations on corporate leverage, as argued in the hypotheses of the study.



The level of corporate debt will depend on the severity of such risks at a country level. The first stage, which we call *the lending decision stage*, takes place before the creditor provides funds to the company and is characterized by the adverse selection risk. The second

stage, *the indebtedness stage*, begins when the borrower (i.e., the company) receives the funds from the creditor and finishes just before the debt is classified as a nonperforming loan. During this stage, moral hazard is the main risk. The last stage, called *the default stage*, starts when the firm is unable to honor its commitments and the loans received previously are considered nonperforming. As the name of the stage implies, the main risk is the default risk.

II.2.2.1. Stage 1: The lending-decision stage

Some empirical studies reveal that eliminating informational opacity on the financial situation of potential borrowers leads to an increase in the amount of credit available (Strahan & Weston, 1998; Detragiache et al., 2000; Rauch & Hendrickson, 2004; Hyytinen & Väänänen, 2006; Hernandez-Canovas & Martinez-Solano, 2007). When lenders have more information about potential borrowers (i.e., they are able to examine borrowers' credit behavior such as their credit history and current obligations), they usually provide more credit (Padilla & Pagano, 1997; 2000; Baas & Schrooten, 2006; Djankov et al., 2007; Brown et al., 2009; Houston et al., 2010) because they are less concerned about the risk of financing unprofitable projects (Jaffee & Russell, 1976; Stiglitz & Weiss, 1981). This pattern is especially pronounced during economic contraction periods because adverse selection costs vary counter-cyclically with the performance of the economy (Choe et at., 1993). This idea is reinforced by Li & Ferreira (2011), who support that policy-makers should develop mechanisms and institutions that promote transparency in financial markets in order to reduce transaction costs. In this respect, it is important to disentangle whether a higher level of transparency on the financial situation of potential borrowers helps to reduce information

asymmetries and transaction costs, thus reducing credit rationing problems (Rauch & Hendrickson, 2004).

As a consequence, we expect that the positive effect of macroeconomic expectations on firm debt should be mitigated in environments characterized by less opacity. In line with this prediction, we pose the following hypothesis:

H1: In countries where the availability and the quality of credit information on the borrower are higher, firm debt is less sensitive to the expected performance of the economy.

II.2.2.2. Stage 2: The indebtedness stage

The trade-off theory of capital structure highlights that corporate taxes affect the amount of debt that firms use. The tax shields of debt are one of its main benefits, but this advantage does not mean that companies should increase the amount of debt used infinitely since an excessive level of debt increases the likelihood of financial distress (Hackbarth et al., 2006). Accordingly, prior research supports a negative relation between financial distress costs and debt (Miguel & Pindado, 2001). Financial distress costs can be divided into ex-ante and ex-post costs of distress.

II.2.2.2.1. Ex-ante distress costs

Divergence of interests between debtholders and shareholders (i.e., moral hazard) increases agency costs and discourages the use of debt. However, it is possible to alleviate moral hazard ex-ante by putting in place regulation that protects the rights of both lenders and borrowers. Laws and contracts that can be easily enforced could encourage debtors to

comply with their obligations and could deter them from defaulting on their loans. In line with this argument, Gungoraydinoglu & Öztekin (2011) document that the likelihood that creditors are expropriated by shareholders is lower in contexts where creditors are well protected. Similarly, Fauceglia (2015) highlights the importance of strong creditor protection and debt enforcement by showing that both lead to an increase in private credit volume over GDP.

Fan et al. (2012) find that a firm's leverage increases in countries where the laws that protect external investors are weaker. This result might seem contradictory a priori, but it can be better understood when the authors take into account the maturity of debt. Consistent with previous studies, Fan et al. confirm that the increase in leverage reported initially is due to a rise in short-term debt, which is a financial instrument that is contractually easier to interpret. In addition, they document a positive relation between the existence of explicit bankruptcy codes and long-term debt. Kirch & Terra (2012) also emphasize the importance of country-specific institutional factors as determinants of long-term debt in the South American context. More recently, González (2013) highlights the importance of legal protection and enforcement in the trade-off between financial distress costs and the benefits of debt. He finds that distress costs exceed the advantages of indebtedness when industries experience poor performance in countries with stronger legal systems.

Supporting the relevance of the legal framework when it comes to the capital structure decision, Huang & Shen (2015) find that firms adjust faster their leverage ratios to the target in countries with stronger legal protection. Meanwhile, Demirgüç-Kunt & Maksimovic (1999), Giannetti (2003), and González & González (2008; 2014) point out that protecting creditor rights facilitates the access to long-term debt. Conversely, when the law

does not guarantee the protection of creditor rights sufficiently, lenders may attempt to minimize borrowers' opportunistic behavior by providing short-term debt, which they can stop renewing if the borrower does not fulfill the debt obligations.

In light of these arguments, stronger protection of the legal rights of lenders and borrowers should not only lead to an increase in corporate debt, but also influence the need for positive macroeconomic expectations as drivers of firms' access to debt. Therefore, we expect that:

H2: In countries where the rights of lenders and borrowers are better protected by the law, firm debt is less sensitive to the expected performance of the economy.

II.2.2.2.2. Ex-post distress costs

In the recent global financial crisis that started in 2007-2008, the number of business insolvencies increased dramatically compared with periods of stability. In countries where the effects of the crisis were more profound, many companies experienced serious difficulties to repay their debts. During periods of high economic uncertainty and contraction, borrowers are frequently unable to comply with their debt obligations and need to renegotiate the conditions of contracts with lenders, leading to an increase in the number of unpaid debts. Companies that face extinction are kept alive working with unprofitable assets, commonly offered as collateral that creditors cannot seize. This kind of failure of insolvency regimes increases ex-post distress costs. Indeed, Gungoraydinoglu & Öztekin (2011) point out that more efficient bankruptcy regulation reduces ex-post financial distress costs, which would have a positive effect on the access to corporate leverage. In this respect,

Pindado et al. (2006) find a negative effect of insolvency costs on long-term debt. The findings obtained by these authors confirm that the decision to use debt and the amount of debt used implies a trade-off between debt tax shields on the one hand and the insolvency costs of debt and the liquidation value of the firm's assets on the other hand.

Supporting the importance of bankruptcy regulation, Funchal (2008) finds that, until the 2005 bankruptcy reform, creditors' expected returns in Brazil were very low when companies were declared insolvent. After the reform, which aimed to address this problem by improving the protection given to creditors, there was an increase in firm debt. However, Boubakri & Ghouma (2010) suggest that the development of debt markets is beyond the enactment of new laws. These authors highlight the importance of enforcing existing laws, especially legal measures whose objective is to reduce the costs and duration of insolvency proceedings. Therefore, in line with the trade-off theory and the theoretical arguments discussed above, we expect that, in countries where financial insolvency costs are high, the use of debt is less attractive to firms and they are more careful in their financing decisions to avoid an overleverage problem.

As a result, higher insolvency costs discourage firms from using debt and simultaneously exacerbate the need for promising economic expectations to facilitate firms' access to debt. Accordingly, we pose the third hypothesis of the study:

H3: In countries where ex-post financial distress costs are higher, firm debt is more sensitive to the expected performance of the economy.

II.2.2.3. Stage 3: The default stage

Regardless of the financial situation of borrowers, lenders always face the risk that either the principal or the interests are not paid in due course. This could happen because borrowers experience a cash shortage or because of opportunistic behavior. If this problem is generalized, lenders will impose stricter requirements on borrowers to protect themselves from potential losses. In this regard, default risk and capital structure choices are closely related with macroeconomic risk since defaults are more likely, as well as costlier and harder to face, during periods of economic contraction (Arnold et al., 2013).

Recognizing the importance of establishing global guidelines that enable lenders to address the risk of unpaid debt, the Basel Committee on Bank Supervision provides recommendations for credit risk management. The main objective of the Basel Accords is to guarantee that financial institutions have enough capital to meet their obligations and absorb unexpected losses. Some countries adopt the guidelines established in these accords as recommendations, while the vast majority takes them as mandatory laws and regulations. One of the consequences of this worldwide agreement on how to address credit risk could be a contraction in bank credit, with the aim of complying with capital requirements (Brummermeier, 2009), when lenders face large unexpected losses, such as those caused by nonperforming loans. Therefore, an argument can be made that an increase in the amount of nonperforming loans negatively affects firm leverage due to the credit rationing problem that such situation creates.

A contraction in credit supply is a primary determinant of corporate financial policies during crisis and economic contractions (Kahle & Stulz, 2013) since under such circumstances credit risk and the probability of firm defaults rises (Hackbarth et al., 2006).

Consequently, we expect that, in countries with higher default rates, the credit rationing problem should be more severe, which in turn hinders debt financing. In this scenario, promising macroeconomic expectations play a more important role. For this reason, our final hypothesis can be formulated as follows:

H4: In countries where the risk of default is more severe, firm debt is more sensitive to the expected performance of the economy.

II.3. Data, variables, and estimation method

II.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 four 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 use the consensus of the different financial analysts about the expected gross domestic product (GDP) of each country of the sample to calculate economic expectations. We collate these data from Bloomberg. Third, we need several country-level variables to empirically measure how severe the risk that exists at each stage of the lending process is: that is, adverse selection, moral hazard, and default risk. The four variables that we use in the main analyses are the depth of credit information index, the strength of legal rights index, the time to resolve insolvency, and the ratio of bank nonperforming loans to total gross loans. We get this information from the World Bank website. In particular, the first three indicators are provided as part of the Doing Business Project, while the last one is

presented in the Global Financial Stability Report developed by the International Monetary Fund (IMF). The historical GDP of each country, which is used to compute the expected performance of the economy, is also obtained from the website of the World Bank. Fourth, we also use the latest version of the Financial Development and Structure Dataset (i.e., the 2013 update) developed by Beck et al. (2000), which is available from the World Bank website, to compute the ratio of a country's stock and debt market capitalization to GDP. These country-level variables are included as control variables in the empirical models as they could affect leverage decisions (De Jong et al., 2008). Table 1 presents the variable definitions and the data sources used to calculate them.

Table II.1. Definitions of variables and data sources
This table contains the definitions of the variables used in the empirical analyses and the data sources.

Variable	Definition	Source
BOOK VALUE OF LEV	Long-term debt / Total assets	Worldscope
MARKET VALUE OF LEV	Long-term debt / (Total assets - Book value of equity + Market capitalization)	Worldscope
DEPINDEX	Depth of credit information index (0=low to 8=high)	World Bank
LEGRIGINDEX	Strength of legal rights index (0=weak to 12=strong)	World Bank
INSOLVENCY	Time to resolve insolvency (years)	World Bank
NONPERFLOANS	Bank nonperforming loans to total gross loans (%)	World Bank
EXPECTATIONS	Expected GDP - Current GDP	Bloomberg
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 leverage of sector using two-digit SIC codes	Worldscope
MARKET VALUE OF INDLEV	Mean of market value of leverage of sector using two-digit SIC codes	Worldscope
LIQ	Current assets / Current liabilities	Worldscope
SMC	Stock market capitalization / GDP	World Bank
BMC	Bond market capitalization (private and public) / GDP	World Bank
MARKETDUM	Dummy variable equals to one if the financial system of the respective country is market-based and zero if it is bank-based	See main text

The years considered in our regression analyses vary slightly across models because of the availability of the country-level data that we need to test each of our four hypotheses. Data on the availability of credit information and strength of legal rights (Hypotheses 1 and

2) are available since 2004, information on the time needed to resolve insolvency (Hypothesis 3) is available since 2003, and data on the amount of nonperforming loans (Hypothesis 4) is available since 1998. However, note that we lose the initial year because the 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.

Table II.2. Distribution of the sample by year

This table shows the number of observations by year. Data are extracted for companies for which information is available for at least five consecutive years between 1999 and 2013 in the Worldscope database. The availability of country-level data in the website of the World Bank determines the size of the sample used to test each hypothesis.

	Hypotheses 1 and 2		Hypothesis 3		Hypothesis 4	
	Observations	%	Observations	%	Observations	%
1999					2,728	2.55
2000					3,687	3.44
2001					5,018	4.68
2002					6,075	5.67
2003					6,886	6.43
2004			6,569	8.16	7,579	7.07
2005	6,985	9.67	7,487	9.30	8,304	7.75
2006	7,948	11.01	8,450	10.49	9,033	8.43
2007	9,182	12.72	9,660	11.99	9,944	9.28
2008	9,856	13.65	10,321	12.82	10,166	9.49
2009	10,170	14.08	10,121	12.57	9,962	9.30
2010	8,184	11.33	8,135	10.10	8,054	7.52
2011	7,680	10.64	7,631	9.48	7,582	7.08
2012	6,515	9.02	6,490	8.06	6,465	6.03
2013	5,686	7.87	5,674	7.05	5,658	5.28
Total	72,206	100.00	80,538	100.00	107,141	100.00

The final sample contains 11,698 listed companies (107,141 firm-year observations) and spans the years 1999 to 2013, covering 35 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-digits SIC codes 49 and 60). The distribution of the sample by country is presented in Table 3.

Table II.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 information is available for at least five consecutive years between 1999 and 2013 in the Worldscope database. The availability of country-level data in the website of the World Bank determines the size of the sample used to test each hypothesis.

	Hypotheses 1 and 2		Hypothesis 3		Hypothesis 4	
	Firms	Average number of observations per firm	Firms	Average number of observations per firm	Firms	Average number of observations per firm
Argentina	30	8	32	8	32	11
Australia	397	7	419	8	472	10
Austria	35	8	36	8	40	11
Belgium	48	8	49	9	58	12
Brazil	88	6	98	6	113	8
Canada	281	7	294	8	326	10
China	1,131	8	1,158	9	1,266	11
Colombia	5	7	5	7	8	9
Czech Republic	2	8	2	9	4	10
Denmark	59	7	62	7	74	11
Finland	84	7	87	8	91	11
France	364	7	376	8	421	11
Germany	305	7	321	8	386	10
Greece	125	7	131	8	156	9
Hong Kong	442	7	469	8	523	10
Hungary	8	8	8	8	8	8
India	1,001	7	1,016	7	1,016	7
Indonesia	100	7	111	8	128	9
Ireland	30	7	33	8	36	10
Italy	84	7	86	8	92	9
Japan	1,515	8	1,609	9	1,759	11
Malaysia	501	7	532	8	572	10
Mexico	63	8	67	8	72	11
Netherlands	81	7	89	8	103	11
Norway	57	7	58	8	68	10
Poland	96	7	100	7	105	8
Portugal	28	8	29	9	36	12
Singapore	260	5	275	6	293	8
South Africa	145	8	150	8	167	12
Spain	67	8	69	9	79	12
Sweden	148	8	151	8	166	11
Switzerland	121	7	123	8	132	11
Turkey	113	6	113	6	101	6
United Kingdom	638	7	674	8	735	10
United States of America	1,718	7	1,791	8	2,060	10
Total	10,170	7	10,623	8	11,698	10

II.3.2. Model specification

We estimate a partial adjustment model of debt that follows the specification proposed by Flannery & Rangan (2006) and Öztekin & Flannery (2012), 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 long-term debt of the company *i* at the end of year *t* (Marsh, 1982; Kim & Sorensen, 1986; Titman & Wessels, 1988; Cantillo & Wright, 2000; Miguel & Pindado, 2001; Giannetti, 2003; Korajczyk & Levy, 2003). In the main analyses, we use the book value of long-term debt, while in the robustness tests we estimate the models again using the market value of long-term debt.

We use a long-term debt measure as dependent variable because of our focus on how the effect of macroeconomic expectations on firm leverage is moderated by the risks that characterize the lending process and by the institutions in place that alleviate such risks. Focusing on long-term debt, as opposed to total debt, is especially suitable when analyzing the effect of macroeconomic factors on a firm's capital structure (Korajczyk & Levy, 2003) and when investigating financial distress costs (Pindado et al., 2006). An additional reason not to use total debt in our analyses is that the factors that affect short- and long-term debt are different (Pindado et al., 2006). Also the optimal level of debt depends on its maturity, with target leverage increasing in the maturity of debt (Jeon & Nishihara, 2015). Therefore, we should avoid mixing both debt types in the model because this could lead to biased results. LEV_{it}^{*} is the target value of long-term debt of firm *i* at the end of year *t*; λ is the speed of adjustment of leverage to the firm's desired level; and ε_{it} is the error term. Following previous literature (Rajan & Zingales, 1995; Korajczyk & Levy, 2003; Flannery & Rangan, 2006; Levy & Hennessy, 2007; Frank & Goyal, 2009; Öztekin & Flannery, 2012), we define firms' target debt as a function of its most widely accepted determinants:

$$LEV_{it}^{*} = \alpha_0 + \alpha_1 EXP_{jt} + \delta_H DUMMY\_S_{j,t-1} EXP_{jt} + \alpha_2 S_{j,t-1} + \alpha_X X_{i,t-1} + \alpha_C C_j + \alpha_T T_t + \eta_i + \upsilon_{it}, \quad (2)$$

where EXP_{jt} captures the expected performance of the economy as the difference between the analysts' consensus of the expected GDP of each country and its previous GDP. If the value of the expected GDP for the next year is higher than the current GDP, EXP_{jt} takes a positive value (which means that the expected performance of the economy is promising as compared to the current performance of the economy) and it takes a negative value otherwise. Note that in order to test our hypotheses, this variable is interacted with the corresponding $DUMMY\_S_{j,t-1}$. Meanwhile, $S_{j,t-1}$ is the variable of interest in each hypothesis. We use this variable to define the corresponding $DUMMY\_S_{j,t-1}$. $X_{i,t-1}$ includes all control variables. Note that two types of dummy variables are also included in Equation (2): C_j and T_t enable us to control for country-specific and time-specific effects, respectively. To account for the differences that exist across firms in the extent to which their managers understand, rely on, and incorporate macroeconomic expectations in their financing decisions, we control for individual heterogeneity through the individual effect, η_i. Accounting for this effect is necessary because it also captures other managerial characteristics that cannot be observed.

Such characteristics include the academic background, professional experience, and skills of managers, which in turn determine their degree of overconfidence when making corporate decisions. The recent global financial crisis might have also led managers to be more averse to debt. There are other relevant individual characteristics that might explain

managers' reluctance to take on excessive debt, but that cannot be observed and measured by researchers, especially in large cross-country samples like ours. For instance, the incentives and motivations of managers based on their compensation schemes, their stock ownership, and the level of diversification of their personal portfolios could lead them to prefer certain capital structures (Coles et al., 2006; Strebulaev & Yang, 2013).

These characteristics may determine how and when managers incorporate information on the macroeconomic context in their debt decisions. And the extent to which this information is considered varies from firm to firm. Given this situation, we are compelled to control for unobservable heterogeneity in the estimation process. Although personal attributes are difficult if not impossible to observe, it is reasonable to assume that within the company they remain constant over time as managers' background, preferences, and personality traits do not easily change. Therefore, we can control for unobservable heterogeneity by using a panel data method that accounts for such individual effects. Finally, υ_{it} is the random disturbance.

We obtain our baseline empirical specification as detailed in Equation (3) after substituting the determinants of target leverage, Equation (2), in the partial adjustment model of debt, Equation (1), and subsequently rearranging terms:

$$LEV_{it} = \lambda\alpha_0 + (1-\lambda)LEV_{i,t-1} + (\lambda\alpha_1)EXP_{jt} + (\lambda\delta_H)DUMMY\_S_{j,t-1}EXP_{jt} + (\lambda\alpha_2)S_{j,t-1} + (\lambda\alpha_X)X_{i,t-1} + (\lambda\alpha_C)C_j + (\lambda\alpha_T)T_t + \lambda\eta_i + \upsilon_{it}, \quad (3)$$

where λ should comply with the condition that $0<\lambda<1$. The $S_{j,t-1}$ and $DUMMY\_S_{j,t-1}$ variables are measured in a different way in each empirical model depending on the specific

hypothesis that we test. However, before explaining the meaning of these two variables in the four resulting specifications (one for each hypothesis), we rearrange the variables of interest and simplify the notation used for the coefficients as in Equation (4) for a clearer interpretation as to whether our results support the hypotheses proposed:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + \left(\beta_1 + \gamma_H DUMMY\_S_{j,t-1}\right)EXP_{jt} + \beta_2 S_{j,t-1} + \beta_X X_{i,t-1} + \beta_C C_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}. \quad (4)$$

In the first empirical specification, which allows us to test Hypothesis 1, the $S_{j,t-1}$ variable is the depth of credit information index that exists in each country: $DEPINDEX_{j,t-1}$. It is a measure of the information asymmetries that exist between borrowers and lenders at a country level, which are an important determinant of credit availability (Pagano & Jappelli, 1993; Jappelli & Pagano, 2002; Sapienza, 2002; Houston et al., 2010; Mild et al., 2015). The index focuses on the rules that affect the scope, accessibility, and quality of credit information available through public and private credit registries and ranges from zero to eight, with higher values indicating the availability of more and better quality credit information. The index that we obtain from the World Bank website is a slightly modified version of the measure proposed by Djankov et al. (2007). The index is based on the eight characteristics of registries that are associated with more private credit.[1] Consistent with previous literature, we expect to find a positive direct effect of the availability of credit information on firm debt ($\hat{\beta}_2 > 0$).

[1] Detailed information about the eight dimensions of the index is available in the website of the Doing Business Project: http://www.doingbusiness.org/

The moderating effect of the depth of credit information in the relation between firm leverage and economic expectations is measured with the interaction term $DEPINDEX\_HI_{j,t-1}EXP_{jt}$. Therefore, in this first model, the $DUMMY\_S_{j,t-1}$ variable that we define is $DEPINDEX\_HI_{j,t-1}$, which equals one for countries in which the value of the depth of credit information index is in the upper tercile of the corresponding year, and zero otherwise. Therefore, the dummy variable takes the value of one for countries with high flow of credit information between lenders and borrowers.

Regarding the indirect effect of the availability of credit information on firm debt, two cases should be considered. First, for firms that operate in countries where the value of the index is not in the upper tercile, the effect of economic expectations on firm debt is captured by β_1 (given that $DEPINDEX\_HI_{j,t-1}$ = 0). Second, in countries with high transparency between lenders and borrowers, the impact is evaluated by $(\beta_1 + \gamma_1)$ (given that $DEPINDEX\_HI_{j,t-1}$ = 1). Therefore, we expect $(\hat{\beta}_1 + \hat{\gamma}_1) < \hat{\beta}_1$, consistent with Hypothesis 1.

To test Hypothesis 2, we replace the $S_{j,t-1}$ variable of Equation (4) with the strength of legal rights index: $LEGRIGINDEX_{j,t-1}$. This index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from zero to 12, with higher scores indicating that laws are better designed to facilitate access to credit. The index is based on ten aspects related with legal rights in collateral law and two aspects in bankruptcy law. Both groups of aspects are associated with more private credit.[2] Unlike Akbel & Schnitzer (2011), who use a combined

[2] For detailed information about the 12 dimensions of the index, check the website of the Doing Business Project indicated in footnote 1.

measure of the indices of depth of credit information and the strength of legal rights called the getting credit index, we analyze the impact of both indices on corporate debt separately because each of them enables us to focus on a different stage of the lending process. Regarding the direct effect of the strength of legal rights of lenders and borrowers on corporate leverage, our expectation is to find a positive relation ($\hat{\beta}_2 > 0$).

In the specification developed to test Hypothesis 2, the $DUMMY\_S_{j,t-1}$ variable is $LEGRIGINDEX\_HI_{j,t-1}$, which equals one for countries with a value of the strength of legal rights index in the upper tercile of the corresponding year, and zero otherwise. Hence, the dummy variable takes the value of one for countries with high strength of legal rights. The resulting interaction term, $LEGRIGINDEX\_HI_{j,t-1}EXP_{jt}$, allows us to test the moderating effect of the strength of legal rights in the relation between the expected performance of the economy and debt.

This interaction term captures the differential effect of economic expectations on debt depending on the strength of legal rights in the country. On the one hand, in countries with medium or low strength of legal rights, the effect of the expected performance of the economy on firm debt is β_1 (given that $LEGRIGINDEX\_HI_{j,t-1} = 0$). On the other hand, in countries with high strength of legal rights, the effect of expectations on leverage is $(\beta_1 + \gamma_2)$, (given that $LEGRIGINDEX\_HI_{j,t-1} = 1$). Consequently, we expect that $(\hat{\beta}_1 + \hat{\gamma}_2) < \hat{\beta}_1$ to find support for Hypothesis 2.

In the empirical specification used to test Hypothesis 3, the $S_{j,t-1}$ variable is $INSOLVENCY_{j,t-1}$, which is a country-level measure of the time needed to resolve insolvency. The efficiency of insolvency codes, which should contribute to reduce financial distress costs, depends first on the costs incurred to resolve the situation, second on the

recovery rate of the loan, and finally on the time that the process lasts. We capture ex-post distress costs at a country level with the average number of years since filing for insolvency in the courts until the resolution of distressed assets. We use this measure rather than the strength of insolvency framework index because of data availability and to obtain a time-varying measure. Using a measure of the time it takes to resolve insolvency is particularly suitable in our context because the time spent in a bankruptcy situation is positively correlated with the indirect costs of financial distress (Thorburn, 2000). The risk that lenders only recover a low percentage of the capital increases as the time for the resolution of insolvency rises. In this regard, we expect to find a negative direct effect of the time to resolve insolvency on firm debt ($\hat{\beta}_2 < 0$).

As in previous specifications, we build a $DUMMY\_S_{j,t-1}$ variable that we interact with economic expectations to test Hypothesis 3. Specifically, the $INSOLVENCY\_HI_{j,t-1}$ dummy variable takes the value of one for countries in which the time to resolve insolvency is in the upper tercile of the sample, and zero otherwise. The interaction term that allows us to test the moderating effect of ex-post distress costs on the relation between expectations and long-term debt is $INSOLVENCY\_HI_{j,t-1}EXP_{jt}$.

Depending on how long it takes to resolve insolvency, we can expect two situations. On the one hand, in countries where this is a relatively fast process, the effect of the expected performance of the economy on debt is measured by β_1 (given that $INSOLVENCY\_HI_{j,t-1}$ = 0). On the other hand, in countries where resolving insolvency takes a relatively long time, the impact is assessed by $(\beta_1 + \gamma_3)$ (given that $INSOLVENCY\_HI_{j,t-1}$ = 1). In line with Hypothesis 3, we expect that $\left(\hat{\beta}_1 + \hat{\gamma}_3\right) > \hat{\beta}_1$.

In our final specification, the $S_{j,t-1}$ variable of Equation (4) is replaced with a measure of the ex-post default risk of the banking sector in each country (Ayuso et al., 2004): $NONPERFLOANS_{j,t-1}$. This variable is calculated as the value of nonperforming loans of the banking sector in each country divided by the total value of the loan portfolio (including nonperforming loans before the deduction of specific loan loss provisions) of the respective country. The direct effect of the nonperforming loans rate on long-term debt is expected to be negative ($\hat{\beta}_2 < 0$).

To test how the risk of default at the country level moderates the relation between the expected performance of the economy and corporate leverage, the $DUMMY\_S_{j,t-1}$ variable that we define is the $NONPERFLOANS\_HI_{j,t-1}$ variable, which equals one for countries with the highest default risk in their banking sector in the corresponding year (i.e., countries in the upper tercile of the sample), and zero otherwise. Consequently, the interaction term that we include in our final empirical model to test Hypothesis 4 is $NONPERFLOANS\_HI_{j,t-1}EXP_{jt}$.

The interaction term enables us to analyze two different scenarios depending on how severe the risk of default is. The first scenario refers to financial systems in which the default risk is not high. In this case, the effect of expectations on firm leverage is captured by β_1 (given that $NONPERFLOANS\_HI_{j,t-1}$ = 0). The second scenario refers to countries whose financial system faces high default risk. In these countries, the relation between macroeconomic expectations and firm long-term debt is measured by $(\beta_1 + \gamma_4)$ (given that $NONPERFLOANS\_HI_{j,t-1}$ = 1). Therefore, we expect that $(\hat{\beta}_1 + \hat{\gamma}_4) > \hat{\beta}_1$ to find support for Hypothesis 4.

The set of control variables included in all empirical specifications contains the following firm-level characteristics: profitability ($PROFIT_{i,t-1}$), measured as the ratio of the operating income before depreciation and amortization 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 (Erel et al., 2012; Öztekin & Flannery, 2012); the level of assets' tangibility ($TANG_{i,t-1}$), measured as fixed assets over total assets (Rajan & Zingales, 1995; Frank & Goyal, 2009; Öztekin & Flannery, 2012); 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); and liquidity ($LIQ_{i,t-1}$), measured as short-term assets over short-term liabilities (Öztekin & Flannery, 2012).

Additionally, in line with previous capital structure literature, we need to control for the impact of the development of stock and debt markets because these country-level factors can influence leverage decisions (De Jong et al., 2008). We include three variables in the right-hand side of the models to capture these effects. Following De Jong et al. (2008), we measure the level of development of stock markets ($SMC_{i,t-1}$) and the degree of development of bond markets ($BMC_{i,t-1}$) as the ratio of stock market capitalization over a country's GDP and the ratio of total (private and public) bond market capitalization over a country's GDP, respectively. Finally, we define a dummy variable ($MARKETDUM_j$) that

equals one if the financial system of the respective country is market-based and zero if it is bank-based. To classify the countries represented in the sample as either market- or bank-oriented, we use the criteria of Demirgüç-Kunt & Maksimovic (2002). However, some countries are not considered in this work, which requires the use of additional sources. In particular, we follow Berglof & Bolton (2002) to classify some Eastern European countries, whereas we code China as in Allen et al. (2005). Table 4 reports the main descriptive statistics of all variables considered in the analyses.

Table II.4. Summary statistics
This table presents the main descriptive statistics of the dependent, country-specific, and control variables used in the analyses.

	Mean	Std. Dev.	Minimum	Median	Maximum
BOOK VALUE OF LEV	0.107	0.127	0.000	0.060	0.699
MARKET VALUE OF LEV	0.092	0.115	0.000	0.046	0.699
DEPINDEX	4.992	1.294	0.000	5.000	6.000
LEGRIGINDEX	7.248	2.153	3.000	8.000	10.000
INSOLVENCY	1.716	1.173	0.400	1.500	10.000
NONPERFLOANS	0.041	0.050	0.001	0.026	0.344
EXPECTATIONS	-0.001	0.029	-0.137	-0.001	0.160
PROFIT	0.082	0.148	-1.985	0.093	1.697
MTB	1.251	0.990	0.000	0.927	7.000
TAXES	0.233	0.171	0.000	0.253	0.700
DEPAMTA	0.039	0.032	0.000	0.032	0.499
SIZE	5.415	1.918	-1.487	5.294	12.894
TANG	0.348	0.199	0.000	0.340	0.800
BOOK VALUE OF INDLEV	0.116	0.037	0.029	0.107	0.411
MARKET VALUE OF INDLEV	0.100	0.040	0.023	0.093	0.382
LIQ	2.098	1.670	0.001	1.586	15.000
SMC	1.105	0.785	0.093	0.981	5.695
BMC	0.970	0.623	0.100	0.793	2.560
MARKETDUM	0.458	0.498	0.000	0.000	1.000

II.3.3. Estimation method

We are compelled to use the panel data methodology in the estimation of the capital structure models because, as Equation (2) highlights, unobservable heterogeneity is an important determinant of target debt. 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 characteristics important for the decision-making process and unobservable to the

researcher, but that remain constant over time. Among the firm-specific characteristics that the individual effect captures, some relevant ones are managers' personality traits, such as their degree of overconfidence (Malmendier et al., 2011) and the experience acquired during the Great Depression (Graham & Narasimhan, 2004) and other similar crises. Likewise, managers' incentives and motivations that derive from their compensation schemes and their stock ownership in the company (Strebulaev & Yang, 2013) are also contained in the individual effect as these personal attributes and preferences do not easily change over time. It is important to control for this unobservable heterogeneity, which we are able to do by using the panel data methodology, as the factors it represents could play an important role in the analysis of corporate capital structure.

In addition to the problem of unobservable heterogeneity, the explanatory variables described above may be correlated with the error term, which would create an endogeneity problem. To control for this problem, 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 et al., 2015). Note that our capital structure model complies with the stationarity assumption since the correlation between the explanatory variables and the unobservable heterogeneity can be assumed constant over time. This is a reasonable assumption over a relatively short time period, as Wintoki et al. (2012) argue. We use the lags from $t-1$ to $t-4$ for all the right-hand side variables as instruments for the equations in

differences (except for the lagged variable, Leverage, which is assigned lags from $t-2$ to $t-5$) and only one instrument for the equations in levels, as suggested by Blundell & Bond (1998).

Given that we use the GMM estimator, we 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 the joint significance of the reported coefficients, as well as of the country and time dummies.

II.4. Results

Table 5 presents the regression results that enable us to test our hypotheses. Specifically, Column (1) shows the results from estimating the empirical model that we obtain when the variable of interest is the level of transparency between lenders and borrowers, as captured by the depth of credit information index of the Word Bank, as well as the corresponding interaction term. This specification enables us to test Hypothesis 1. Column (2) exhibits the results of the debt model that includes in its right-hand side the legal rights index and the interaction term between the dummy variable that we define based on this index and economic expectations. Using this empirical specification, we can test Hypothesis 2. In Column (3), we present the regression results from the estimation of the model in which the main variable of interest is the time that it takes to resolve insolvency as a proxy for ex-post financial distress costs. This model, which also includes the interaction term between the expected performance of the economy and the insolvency dummy variable, is estimated to test Hypothesis 3. Finally, Column (4) highlights the results from estimating

the partial adjustment model of long-term debt in which the value of nonperforming loans at a country level is used to capture the severity of default risk and to define a dummy variable that is interacted with economic forecast. We use this specification to test Hypothesis 4.

Following previous literature, (Shleifer & Vishny, 1992; Kiyotaki & Moore, 1997; Levy & Hennessy, 2007; Frank & Goyal, 2009), the estimated coefficients in all models are consistent with the idea that macroeconomic expectations have a positive effect on firm debt (the coefficients on EXP_{jt} are positive and statistically significant with values of 0.101, 0.067, 0.046, and 0.060 in Columns (1), (2), (3), and (4), respectively; see $\hat{\beta}_1$). In addition, as we discuss below, in each one of the four models developed we include the direct impact of the country-specific variables of interest on leverage and we obtain empirical evidence consistent with previous studies.

First, our results show that there is a positive relation between corporate debt and the level of transparency between lenders and borrowers, thus corroborating the findings of prior research (Padilla & Pagano, 1997; 2000; Baas & Schrooten, 2006; Djankov et al., 2007; Brown et al., 2009; Houston et al., 2010). Note that the availability and quality of credit information on borrowers has a positive impact on leverage (the coefficient on $DEPINDEX_{j,t-1}$ is positive and statistically significant with a value of 0.001 in Column (1); see $\hat{\beta}_2$).

Second, the results that we obtain when we include in the right-hand side of the partial adjustment model of debt the legal right index variable, $LEGRIGINDEX_{j,t-1}$, are consistent with Demirgüç-Kunt & Maksimovic (1999), Giannetti (2003), González & González (2008), Fan et al. (2012), González & González (2014), and Fauceglia (2015). Specifically, we confirm that protecting the rights of lenders and borrowers (i.e., reducing ex-ante distress

Table II.5. Effect of economic expectations and country-level institutional characteristics on the book value of long-term debt

Generalized method of moments regression results from:
$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_H DUMMY\_S_{j,t-1})EXP_{jt} + \beta_2 S_{j,t-1} + \beta_X X_{i,t-1} + \beta_C C_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}$.
Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as χ^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 χ^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 χ^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 χ^2 under the null of no correlation between the instruments and the error term, degrees of freedom in parentheses.

	(1)	(2)	(3)	(4)
β_1 $EXPECTATIONS_{jt}$	0.101 (0.010)***	0.067 (0.011)***	0.046 (0.009)***	0.060 (0.009)***
β_2 $DEPINDEX_{j,t-1}$	0.001 (0.000)***			
γ_1 DEPINDEX $HI_{j,t-1}EXP_{jt}$	-0.049 (0.011)***			
β_2 $LEGRIGINDEX_{j,t-1}$		0.006 (0.000)***		
γ_2 LEGRIGINDEX_$HI_{j,t-1}EXP_{jt}$		-0.026 (0.010)**		
β_2 $INSOLVENCY_{j,t-1}$			-0.003 (0.001)***	
γ_3 INSOLVENCY_$HI_{j,t-1}EXP_{jt}$			0.028 (0.014)**	
β_2 $NONPERFLOANS_{j,t-1}$				-0.072 (0.008)***
γ_4 NONPERFLOANS_$HI_{j,t-1}EXP_{jt}$				0.107 (0.010)***
β_3 $LEV_{i,t-1}$	0.674 (0.007)***	0.662 (0.007)***	0.659 (0.007)***	0.636 (0.006)***
β_4 $PROFIT_{i,t-1}$	-0.004 (0.004)	-0.006 (0.004)	-0.013 (0.004)***	-0.008 (0.003)***
β_5 $MTB_{i,t-1}$	0.007 (0.001)***	0.008 (0.001)***	0.008 (0.001)***	0.007 (0.000)***
β_6 $TAXES_{i,t-1}$	0.000 (0.003)	-0.001 (0.003)	-0.001 (0.003)	0.003 (0.002)
β_7 $DEPAMTA_{i,t-1}$	-0.084 (0.025)***	-0.091 (0.025)***	-0.070 (0.021)***	-0.021 (0.014)
β_8 $SIZE_{i,t-1}$	0.010 (0.001)***	0.011 (0.001)***	0.011 (0.001)***	0.011 (0.001)***
β_9 $TANG_{i,t-1}$	0.016 (0.005)***	0.010 (0.005)**	0.013 (0.005)***	0.008 (0.004)*
β_{10} $INDLEV_{i,t-1}$	0.177 (0.027)***	0.179 (0.026)***	0.158 (0.025)***	0.161 (0.024)***
β_{11} $LIQ_{i,t-1}$	-0.003 (0.000)***	-0.003 (0.000)***	-0.003 (0.000)***	-0.003 (0.000)***
β_{12} $SMC_{j,t-1}$	-0.004 (0.001)***	-0.008 (0.001)***	-0.002 (0.001)**	-0.001 (0.001)
β_{13} $BMC_{j,t-1}$	0.004 (0.001)***	0.005 (0.001)***	0.000 (0.001)	0.004 (0.002)***
β_{14} $MARKETDUM_j$	0.016 (0.002)***	0.004 (0.003)	0.016 (0.002)***	0.012 (0.002)***
β_0 CONSTANT	-0.052 (0.006)***	-0.074 (0.006)***	-0.058 (0.006)***	-0.026 (0.005)***
$t_1 - H_0$: $\beta_1 + \gamma_1 = 0$	4.10 (0.013)***			
$t_2 - H_0$: $\beta_1 + \gamma_2 = 0$		2.29 (0.018)**		
z_1	11119.94 (15)	11253.68 (15)	12552.27 (15)	18506.56 (15)
z_2	869.03 (35)	1362.07 (35)	1143.83 (35)	1088.67 (35)
z_3	306.83 (8)	306.18 (8)	294.82 (9)	346.30 (14)
m_1	-33.20	-33.18	-35.29	-40.88
m_2	0.11	0.04	0.34	0.19
Hansen	2045.33 (543)	2022.91 (543)	2138.53 (622)	2780.64 (1022)

costs) facilitates firms' access to long-term debt (the coefficient on $LEGRIGINDEX_{j,t-1}$ is positive and statistically significant with a value of 0.006 in Column (2); see $\hat{\beta}_2$).

Third, concerning the direct effect of ex-post distress costs on firm debt, we find that when the time necessary to resolve insolvency is longer, the amount of debt used by

companies decreases (the coefficient on $INSOLVENCY_{j,t-1}$ is negative and statistically significant with a value of –0.003 in Column (3); see $\hat{\beta}_2$). Our results are similar to the empirical evidence of Pindado et al. (2006), Funchal (2008), Boubakri & Ghouma (2010), and Gungoraydinoglu & Öztekin (2011).

Finally, in the last specification, we consider the direct effect of default risk on firm long-term debt. Our regression results highlight that higher default rates lead to credit rationing, which hampers corporate indebtedness (the coefficient on $NONPERFLOANS_{j,t-1}$ is negative and statistically significant with a value of –0.072 in Column (4); see $\hat{\beta}_2$). This result is also consistent with previous literature (Brummermeier, 2009).

Regarding our first hypothesis, in which we focus on the first stage of the lending process, the results confirm that the availability and quality of credit information on borrowers not only affects leverage directly, but it also moderates the relation between economic expectations and corporate long-term debt. As can be seen in Column (1) of Table 5, in countries with the highest transparency level between lenders and borrowers, the positive impact of the expected performance of the economy on debt is weaker (the coefficient on $DEPINDEX\_HI_{j,t-1}EXP_{jt}$ is negative and statistically significant with a value of –0.049; see $\hat{\gamma}_1$). This result lends support to Hypothesis 1. Additionally, the empirical evidence shows that, although more and better credit information alleviates firms' dependence on promising expectations as a way of facilitating their access to debt financing, companies that operate in those countries still present pro-cyclical patterns ($\hat{\beta}_1 + \hat{\gamma}_1$= 0.101 – 0.049 = 0.052 is statistically significant; see t_1).

Therefore, encouraging improvements in the scope, accessibility, and quality of credit information available through public and private registries represents a useful tool to

alleviate the pro-cyclical effect of the expected performance of the economy on firm leverage. This is particularly relevant when the macroeconomic context hinders financial indebtedness; that is, when economic expectations are not encouraging. These findings reveal the importance of transparency in the first stage of the lending process. Policy-makers could alleviate the negative impact of economic expectations, which is a variable beyond their control, on firm long-term debt by promoting that lenders have more information on borrowers at their disposal. This type of initiative would have a positive direct effect on firm debt as well as a positive indirect effect by mitigating the dependence of corporate leverage on the macroeconomic context.

With regard to the second stage of the lending process, we find evidence that supports the idea that ex-ante costs of distress, and more precisely the existence of regulation that aims to prevent such costs, as well as ex-post distress costs, as captured by the time it takes to resolve insolvency, have direct and indirect effects on corporate debt. On the one hand, regarding ex-ante financial distress costs, the results presented in Column (2) of Table 5 are in line with Hypothesis 2. In countries where ex-ante distress costs are lower due to the better protection of lenders' and borrowers' rights, the impact of macroeconomic expectations on firm long-term debt is weaker (the coefficient on $LEGRIGINDEX\_HI_{j,t-1}EXP_{jt}$ is negative and statistically significant with a value of –0.026; see $\hat{\gamma}_2$). We find that, regardless of the moderating effect of stronger legal rights in the expectations–debt relation, the expected performance of the economy still affects firm leverage positively ($\hat{\beta}_1 + \hat{\gamma}_2$= 0.067 – 0.026 = 0.041 is statistically significant; see t_2). Our empirical evidence highlights the importance of having well designed laws on collateral and bankruptcy in place because better regulation

in this area can insulate firms, to a certain degree, from poor economic expectations and facilitates their access to external sources of finance.

On the other hand, with respect to ex-post financial distress costs, we find that in countries where it takes longer to resolve insolvency, the positive effect of the expected performance of the economy on firm debt is more pronounced (the coefficient on $INSOLVENCY\_HI_{j,t-1}EXP_{jt}$ is positive and statistically significant with a value of 0.028; see $\hat{\gamma}_3$). Our results are in line with Hypothesis 3 and confirm that ex-post distress costs are a serious concern for lenders and borrowers to the extent that, when such costs are higher, there is a stronger sensitivity of firm debt to the macroeconomic situation. The negative consequence is that corporate indebtedness is hampered to a greater extent during recessions when the time necessary to resolve insolvency is longer. Our empirical evidence reveals that in countries where public institutions do not take measures to improve insolvency regimes, companies will rely more strongly on better economic expectations when they aim to get debt financing.

Finally, we pay attention to the last stage of the lending relationship between creditors and companies and analyze how the risk of default moderates the effect of economic expectations on leverage. As Column (4) of Table 5 shows, we find that, in countries with the highest rates of nonperforming loans, the positive effect of the expected performance of the economy on corporate borrowing is stronger. This finding highlights that higher default risk exacerbates the pro-cyclical impact of macroeconomic expectations on corporate debt (the coefficient on $NONPERFLOANS\_HI_{j,t-1}EXP_{jt}$ is positive and statistically significant with a value of 0.107; see $\hat{\gamma}_4$). As proposed in Hypothesis 4, we corroborate that firm debt is more sensitive to the macroeconomic context in countries where the risk of default is

higher. In other words, in these countries companies' dependence on promising expectations is stronger than in countries with low default risk because, if the amount of nonperforming loans in the economy is excessively high, banks are more stringent when providing credit to comply with their reserves and capital requirements.

Regarding the control variables, in two specifications we find patterns of pecking order behavior 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 –0.013, and –0.008 in Columns (3), and (4), respectively; see $\hat{\beta}_4$). In addition, our results show a positive effect of growth opportunities on debt (the coefficients on $MTB_{i,t-1}$ are positive and statistically significant with values of 0.007, 0.008, 0.008, and 0.007 in Columns (1), (2), (3), and (4), respectively; see $\hat{\beta}_5$). These results show that firms with higher growth potential look for additional external financing, such as debt financing.

The amount of taxes paid by companies has no significant effect on leverage (the coefficients on $TAXES_{i,t-1}$ are statistically nonsignificant in all columns; see $\hat{\beta}_6$). Although the estimated coefficients on taxes are not significant, non-debt tax shields have a negative impact on firm debt in the first three empirical models (the coefficients on $DEPAMTA_{i,t-1}$ are negative and statistically significant with values of –0.084, –0.091, and –0.070 in Columns (1), (2), and (3), respectively; see $\hat{\beta}_7$). Therefore, they seem to substitute for debt in order to minimize the amount of taxes paid.

Regarding the size of the company, we find a positive effect on leverage (the coefficients on $SIZE_{i,t-1}$ are positive and statistically significant with values of 0.010, 0.011, 0.011, and 0.011 in Columns (1), (2), (3), and (4), respectively; see $\hat{\beta}_8$), which is consistent with the vast majority of previous studies. Furthermore, in the four specifications we find 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 0.016, 0.010, 0.013, and 0.008 in Columns (1), (2), (3), and (4), respectively; see $\hat{\beta}_9$), which is consistent with the idea that tangible assets facilitate indebtedness by serving as collateral.

As expected, 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 0.177, 0.179, 0.158, and 0.161 in Columns (1), (2), (3), and (4), respectively; see $\hat{\beta}_{10}$), supporting 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 a value of –0.003 in all columns; see $\hat{\beta}_{11}$), which confirms that firms with more liquid assets can use them as internal sources of funds and as substitutes for debt.

We now turn our attention to the variables that enable us to control for the effect of stock and bond market development on corporate leverage. In the specifications that allow us to test the first three hypotheses, we find a negative effect of the level of stock market capitalization over GDP on long-term debt (the coefficients on $SMC_{j,t-1}$ are negative and statistically significant with values of –0.004, –0.008, and –0.002 in Columns (1), (2), and (3), respectively; see $\hat{\beta}_{12}$). Moreover, we find a positive significant effect of the level of bond market capitalization over GDP on firm leverage in three specifications (the coefficients on $BMC_{j,t-1}$ are positive and statistically significant with values of 0.004, 0.005, and 0.004 in Columns (1), (2), and (4), respectively; see $\hat{\beta}_{13}$). As expected, these results confirm the intuition that, in countries with more developed stock markets, companies have greater incentives to issue equity, while the development of bond markets facilitates debt

financing. Finally, except for one specification, companies in market-based economies present higher levels of debt compared with firms in bank-based systems (the coefficients on $MARKETDUM_j$ are positive and statistically significant with values of 0.016, 0.016, and 0.012 in Columns (1), (3), and (4), respectively; see $\hat{\beta}_{14}$).

II.5. Robustness checks

II.5.1. Market value of debt

In this section, we test whether our results are robust to the use of the market value of long-term debt, instead of the book value of long-term debt, in Equation (1) and as dependent variable in our empirical specifications. Table 6 presents the results of our additional regression analyses. In each column of this table, we present the coefficients from the estimation of a model that enables us to test one of our hypotheses. First of all, it is worth noting that in the four specifications we continue to find a positive effect of the expected performance of the economy on corporate long-term debt (the coefficients on EXP_{jt} are positive and statistically significant with values of 0.078, 0.063, 0.047, and 0.073 in Columns (1), (2), (3), and (4), respectively; see $\hat{\beta}_1$). Additionally, the empirical evidence on the direct impact of the country-specific variables of interest on leverage is consistent with the previous regression analyses, in which the book value of long-term debt is used as dependent variable.

In particular, we also confirm a positive effect of the transparency level between lenders and borrowers on firm debt (the coefficient on $DEPINDEX_{j,t-1}$ is positive and statistically significant with a value of 0.004 in Column (1); see $\hat{\beta}_2$). Regarding the direct impact of the quality of legal institutions that aim to prevent ex-ante distress costs on leverage, in line with our initial analyses, we find that protecting the rights of lenders and

borrowers (i.e., the existence of regulation that aims to reduce ex-ante distress costs), positively affects firm long-term debt (the coefficient on $LEGRIGINDEX_{j,t-1}$ is positive and statistically significant with a value of 0.002 in Column (2); see $\hat{\beta}_2$). Conversely, ex-post distress costs, as captured by the time it takes to resolve insolvency, have a negative impact on debt (the coefficient on $INSOLVENCY_{j,t-1}$ is negative and statistically significant with a value of –0.003 in Column (3); see $\hat{\beta}_2$). This result corroborates the empirical evidence discussed in the previous section. Finally, the evidence from our robustness tests also confirms a negative relation between default risk and long-term debt (the coefficient on $NONPERFLOANS_{j,t-1}$ is negative and statistically significant with a value of –0.061 in Column (4); see $\hat{\beta}_2$).

More importantly, we still find support for our four hypotheses when the dependent variable in our empirical models is the market value of long-term debt. That is, the four country-specific dimensions related with the lending process that we examine not only affect firm debt directly, but also moderate the relation between macroeconomic expectations and corporate leverage. Regarding our first empirical specification, the results show that in countries with better quality and quantity of information on borrowers the effect of macroeconomic expectations on the market value of long-term debt is mitigated (the coefficient on $DEPINDEX\_HI_{j,t-1}EXP_{jt}$ is negative and statistically significant with a value of –0.030; see $\hat{\gamma}_1$), although the overall effect of the expected performance of the economy on debt remains positive ($\hat{\beta}_1 + \hat{\gamma}_1$= 0.078 – 0.030 = 0.048 is statistically significant; see t_1). The estimated coefficients presented in Column (1) of Table 6 continue to support Hypothesis 1.

The robustness tests also corroborate Hypotheses 2 and 3, which focus on the moderating effects of ex-ante and ex-post distress costs on the relation between firm leverage and the expected performance of the economy. Specifically, in countries where the rights of lenders and borrowers are more strongly protected (i.e., countries with low ex-ante distress costs), firms' long-term debt is less sensitive to variations in economic expectations (the coefficient on $LEGRIGINDEX\_HI_{j,t-1}EXP_{jt}$ is negative and statistically significant with a value of –0.019; see $\hat{\gamma}_2$). However, the relation between the macroeconomic context and corporate debt is still pro-cyclical ($\hat{\beta}_1 + \hat{\gamma}_2$= 0.063 – 0.019 = 0.044 is statistically significant; see t_2), as Column (2) of Table 6 highlights. Moreover, as can be seen in Column (3), we find that in countries where ex-post distress costs are higher (i.e., countries where the time necessary to resolve insolvency is longer), the effect of the expected performance of the economy on corporate debt is more pronounced (the coefficient on $INSOLVENCY\_HI_{j,t-1}EXP_{jt}$ is positive and statistically significant with a value of 0.031; see $\hat{\gamma}_3$).

Finally, the results from estimating our last empirical model when we use a market value measure of long-term debt lend support to Hypothesis 4. More precisely, Column (4) of Table 6 presents the estimated coefficients that show that the effect of economic expectations on firm debt is stronger in countries with high rates of nonperforming loans (the coefficient on $NONPERFLOANS\_HI_{j,t-1}EXP_{jt}$ is positive and statistically significant with a value of 0.141; see $\hat{\gamma}_4$). This stronger sensitivity of corporate leverage to the macroeconomic context is due to the credit rationing problem that a high percentage of nonperforming loans at a country level originates.

Table II.6. Robustness test. Effect of economic expectations and country-level institutional characteristics on the market value of long-term debt

Generalized method of moments regression results from:

$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_H DUMMY\_S_{j,t-1})EXP_{jt} + \beta_2 S_{j,t-1} + \beta_X X_{i,t-1} + \beta_C C_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}$.

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)	(3)	(4)
β_1 EXPECTATIONS$_{jt}$	0.078 (0.012)***	0.063 (0.010)***	0.047 (0.007)***	0.073 (0.008)***
β_2 DEPINDEX$_{j,t-1}$	0.004 (0.000)***			
γ_1 DEPINDEX_HI$_{j,t-1}$EXP$_{jt}$	-0.030 (0.013)**			
β_2 LEGRIGINDEX$_{j,t-1}$		0.002 (0.000)***		
γ_2 LEGRIGINDEX_HI$_{j,t-1}$EXP$_{jt}$		-0.019 (0.010)*		
β_2 INSOLVENCY$_{j,t-1}$			-0.003 (0.001)***	
γ_3 INSOLVENCY_HI$_{j,t-1}$EXP$_{jt}$			0.031 (0.012)**	
β_2 NONPERFLOANS$_{j,t-1}$				-0.061 (0.007)***
γ_4 NONPERFLOANS_HI$_{j,t-1}$EXP$_{jt}$				0.141 (0.010)***
β_3 LEV$_{i,t-1}$	0.552 (0.007)***	0.555 (0.006)***	0.539 (0.006)***	0.525 (0.006)***
β_4 PROFIT$_{i,t-1}$	-0.011 (0.003)***	-0.014 (0.003)***	-0.017 (0.003)***	-0.016 (0.003)***
β_5 MTB$_{i,t-1}$	-0.007 (0.000)***	-0.007 (0.000)***	-0.007 (0.000)***	-0.008 (0.000)***
β_6 TAXES$_{i,t-1}$	-0.004 (0.002)*	-0.002 (0.003)	-0.003 (0.002)	-0.002 (0.002)
β_7 DEPAMTA$_{i,t-1}$	-0.134 (0.021)***	-0.137 (0.021)***	-0.137 (0.018)***	-0.061 (0.013)***
β_8 SIZE$_{i,t-1}$	0.002 (0.001)***	0.002 (0.001)***	0.003 (0.001)***	0.005 (0.000)***
β_9 TANG$_{i,t-1}$	-0.006 (0.005)	-0.008 (0.005)	-0.004 (0.004)	0.012 (0.004)***
β_{10} INDLEV$_{i,t-1}$	0.210 (0.019)***	0.212 (0.019)***	0.182 (0.019)***	0.150 (0.018)***
β_{11} LIQ$_{i,t-1}$	-0.002 (0.000)***	-0.002 (0.000)***	-0.002 (0.000)***	-0.002 (0.000)***
β_{12} SMC$_{j,t-1}$	-0.007 (0.001)***	-0.006 (0.001)***	-0.004 (0.001)***	-0.002 (0.001)**
β_{13} BMC$_{j,t-1}$	0.000 (0.001)	0.000 (0.001)	0.003 (0.001)***	0.003 (0.001)**
β_{14} MARKETDUM$_j$	0.000 (0.002)	-0.011 (0.002)***	0.013 (0.001)***	0.009 (0.002)***
β_0 CONSTANT	-0.015 (0.005)***	-0.014 (0.005)***	-0.012 (0.004)***	0.007 (0.004)*
$t_1 - H_0$: $\beta_1 + \gamma_1 = 0$	4.90 (0.010)***			
$t_2 - H_0$: $\beta_1 + \gamma_2 = 0$		4.51 (0.010)***		
z_1	11089.78 (15)	12279.72 (15)	11555.99 (15)	17966.60 (15)
z_2	942.85 (35)	952.36 (35)	938.83 (35)	909.76 (35)
z_3	772.41 (8)	787.68 (8)	767.61 (9)	1051.36 (14)
m_1	-33.51	-33.38	-35.99	-41.26
m_2	-0.92	-0.96	-1.29	-1.53
Hansen	2516.95 (543)	2513.12 (543)	2710.51 (622)	3345.49 (1022)

II.5.2. Effect of family ownership and controlling for other governance characteristics

As discussed in the previous section, our conclusions remain unchanged regardless of the type of measure (i.e., book or market value) we use for leverage. However, a strand of research shows that a firm's ownership structure, and more precisely the identity of the controlling owner and whether it is a family shareholder or not, can shape corporate capital structure (Pindado et al., 2015). Therefore, we are compelled to check whether the effect of our variables of interest (i.e., economic expectations and the country-level characteristics

that capture the risks inherent at each stage of the lending process) vary across family and nonfamily firms.

Regarding previous results on the relation between family ownership and corporate leverage, a strand of research argues that family firms usually have a preference for more conservative debt policies (Becker, 1981; Bertrand & Schoar, 2006) and that they are even more likely to adopt a zero-debt decision (Strebulaev & Yang, 2013). Family owners' undiversified portfolios, as well as their concerns about the long-term survival of the company and their intention to pass on the business to future generations, could explain such reluctance to debt.

Contrary to this view, ownership concentration, which is a common feature of family firms, has been recently associated with higher debt levels (Keasey et al., 2015). Indeed, an argument can be made that family owners, for which keeping control of the business is of the utmost importance, should prefer debt to equity financing due to the potential loss of control that issuing new shares entails. Supporting family firms' concerns about ownership dilution, several studies find that family ownership impacts positively on corporate debt (King & Santor, 2008; Setia-Atmaja et al., 2009; Croci et al., 2011).

Given that there are arguments for lower and higher debt levels in family firms, we initially check whether family and nonfamily firms in our sample differ from each other in their capital structure decisions. To this aim, we need to divide the sample in two groups (i.e., family and nonfamily firms) based on the type of control. Due to the broad coverage of our international sample, we rely on the Orbis database, which is provided by Bureau van Dijk (BvD), to classify firms. More specifically, in line with previous literature (La Porta et al., 1999; Claessens et al., 2000; Faccio & Lang, 2002; Maury, 2006; Dahya et al., 2008;

Laeven & Levine, 2008; Gonenc et al., 2013), we identify the ultimate owner to define family control. Following Franks et al. (2012) and Lins et al. (2013), who also use BvD databases for their empirical analyses, we use a 25% control threshold to identify a firm's ultimate owner. Once the identity of the ultimate owner is known, we define a family dummy variable, $FDUM_i$, which equals one for companies in which the ultimate owner at the 25% control threshold is an individual or family, and zero otherwise.

After classifying our sample firms into family and nonfamily, we conduct a difference-of-means test to check whether they indeed differ from each other in their debt preferences. As Column (4) in Panel A of Table 7 shows, family firms have higher debt levels regardless of the leverage definition used (book or market value). The results of these univariate tests, along with the empirical evidence obtained in previous studies, highlight that corporate ownership structure, and more precisely family control, plays an important role in the financing decision of the firm. Therefore, we re-estimate our baseline capital structure models controlling for the interaction effects of family control with economic expectations and with the country-level characteristics considered to test each hypothesis.

First, the family firm dummy, $FDUM_i$, is interacted with economic growth expectations. Accordingly, in the new estimations the effect of the expected performance of the economy, EXP_{jt}, on leverage can be moderated by the corresponding country-specific dummy variable, $DUMMY\_S_{j,t-1}$, and by family ownership, $FDUM_i$. Second, we also include in the model an interaction between the family dummy, $FDUM_i$, and the country-specific variable of interest in each hypothesis, $S_{j,t-1}$. As a result, we obtain Equation (5), which is an extended version of Equation (4) and which enables us to test whether family control affects the relations investigated:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + \left(\beta_1 + \gamma_H DUMMY\_S_{j,t-1} + \pi_1 FDUM_i\right)EXP_{jt} + (\beta_2 + \varphi_H FDUM_i)S_{j,t-1} + \beta_X X_{i,t-1} + \beta_C C_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}. \quad (5)$$

Panel B of Table 7 reports the results of estimating Equation (5). As in Table 5, each column presents the estimated coefficients that correspond to one specific hypothesis. Consistent with our initial results, the expected performance of the economy has a positive effect on corporate leverage (the coefficients on EXP_{jt} are positive and statistically significant with values of 0.112, 0.069, 0.050, and 0.055 in Columns (1), (2), (3), and (4), respectively; see $\hat{\beta}_1$).

Additionally, family control does not seem to moderate the effects of the country-level variables that capture the risks inherent at each stage of the lending process on corporate debt. (the coefficients on $DEPINDEX_{j,t-1}FDUM_i$, $LEGRIGINDEX_{j,t-1}FDUM_i$, $INSOLVENCY_{j,t-1}FDUM_i$, and $NONPERFLOANS_{j,t-1}FDUM_i$ are statistically nonsignificant in Columns (1), (2), (3), and (4), respectively; see $\hat{\varphi}_1$, $\hat{\varphi}_2$, $\hat{\varphi}_3$, and $\hat{\varphi}_4$). Therefore, we conclude that for both family and nonfamily firms there is a positive effect of credit information and the level of legal protection on leverage. Meanwhile, the costs of insolvency and the amount of nonperforming loans continue to affect corporate debt negatively regardless of the type of ownership structure of the company. These results highlight that any effort aimed at improving the environment and conditions that surround corporate lending relationships will be equally beneficial to both family and nonfamily firms in terms of facilitating their access to debt financing.

Now, focusing on the country-level factors that shape the effect of economic forecast on debt, we find that the moderating role of protection rights and risk of default in the relation between expectations and corporate indebtedness does not vary across family and nonfamily firms (the coefficients on $FDUM_i EXP_{jt}$ are statistically nonsignificant in Columns (2), and (4); see $\hat{\pi}_1$). Therefore, consistent with Hypothesis 2, in environments where the rights of lenders and borrowers are better protected, the impact of expectations on debt is weaker (the coefficient on $LEGRIGINDEX\_HI_{j,t-1} EXP_{jt}$ is negative and statistically significant with a value of –0.020; see $\hat{\gamma}_2$), although it is still positive ($\hat{\beta}_1 + \hat{\gamma}_2$= 0.069 – 0.020 = 0.049 is statistically significant; see t_2), regardless of the identity of the controlling shareholder. This result implies that a more protective environment for borrowers and lenders will lead to less dependence of debt on positive economic outlooks for all companies.

By contrast, supporting Hypothesis 4, in countries with higher risk of default, the effect of the expected performance of the economy on corporate leverage is higher (the coefficient on $NONPERFLOANS\_HI_{j,t-1} EXP_{jt}$ is positive and statistically significant with a value of 0.105; see $\hat{\gamma}_4$), regardless of firm ownership structure. We can thus conclude that in countries with a higher fraction of nonperforming loans to total loans, the problem of credit rationing equally affects both types of companies (i.e., family and nonfamily), especially during periods of poor macroeconomic expectations.

With respect to the regression results that enable us to test Hypothesis 1, we find that the positive effect of the expected performance of the economy on the firm debt is stronger in family firms (the coefficient on $FDUM_i EXP_{jt}$ is positive and statistically significant with a value of 0.030 in Column (1); see $\hat{\pi}_1$). This finding could be partly explained by the higher

degree of opacity of family firms (Anderson et al., 2009), which could increase lenders' concerns about the risk of financing unprofitable projects, especially during downturns.

However, the dependence of family firms' debt decisions on good macroeconomic expectations is lower when credit information about borrowers is more easily available and of better quality (the coefficient on $DEPINDEX\_HI_{j,t-1}EXP_{jt}$ is negative and statistically significant with a value of –0.054; see $\hat{\gamma}_1$). Such lower dependence also applies to nonfamily firms. Therefore, consistent with our initial empirical evidence, corporate leverage is less sensitive to the expected performance economy in environments with greater flow of information between lenders and borrowers ($\hat{\beta}_1 + \hat{\gamma}_1$= 0.112 – 0.054 = 0.058 is statistically significant; see t_1).

As in Column (1), in Panel B of Table 7, the analyses conducted to test Hypothesis 3 show that debt decisions of family firms are more sensitive to the expected performance of the economy (the coefficient on $FDUM_i EXP_{jt}$ is positive and statistically significant with a value of 0.022 in Column (3); see $\hat{\pi}_1$). Despite this result, we can still conclude that, regardless of the type of ownership structure, the positive effect of expectations on firm debt is stronger in countries where the time to resolve insolvency is higher (the coefficient on $INSOLVENCY\_HI_{j,t-1}EXP_{jt}$ is positive and statistically significant with a value of 0.027; see $\hat{\gamma}_3$).

The findings suggest that family firms' access to debt financing depends more strongly on promising expectations in countries where insolvency processes take longer. Although family ownership contributes to align the interests of owners and managers, it can create another agency conflict between family and minority shareholders (Villalonga & Amit, 2006; Anderson et al., 2009). This conflict exists because controlling families can use their

Table II.7. Robustness test. Effect of economic expectations, country-level institutional characteristics, and family ownership on the book value of long-term debt

Panel A reports mean difference tests between nonfamily and family firms. Column (1) shows the mean for the total sample, while Columns (2) and (3) present the means for nonfamily and family firms, respectively. Column (4) highlights the difference between both groups. Panel B presents generalized method of moments regression results from:

$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_H DUMMY\_S_{j,t-1} + \pi_1 FDUM_i)EXP_{jt} + (\beta_2 + \varphi_H FDUM_i)S_{j,t-1} + \beta_X X_{i,t-1} + \beta_C C_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}$.

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 panel, see Table 5.

Panel A: Mean difference tests	All firms	Nonfamily	Family	*t*-statistic
	(1)	(2)	(3)	(4)
No. Obs.	107,141	78,425	28,716	
BOOK VALUE OF LEV	0.107	0.106	0.110	-4.134***
MARKET VALUE OF LEV	0.092	0.091	0.093	-2.563**
Panel B: GMM regressions	(1)	(2)	(3)	(4)
β_1 EXPECTATIONS$_{jt}$	0.112 (0.009)***	0.069 (0.011)***	0.050 (0.009)***	0.055 (0.009)***
β_2 DEPINDEX$_{j,t-1}$	0.001 (0.000)***			
γ_1 DEPINDEX_HI$_{j,t-1}$EXP$_{jt}$	-0.054 (0.011)***			
φ_1 DEPINDEX$_{j,t-1}$FDUM$_i$	0.000 (0.000)			
β_2 LEGRIGINDEX$_{j,t-1}$		0.006 (0.000)***		
γ_2 LEGRIGINDEX_HI$_{j,t-1}$EXP$_{jt}$		-0.020 (0.010)*		
φ_2 LEGRIGINDEX$_{j,t-1}$FDUM$_i$		0.000 (0.000)		
β_2 INSOLVENCY$_{j,t-1}$			-0.003 (0.001)***	
γ_3 INSOLVENCY_HI$_{j,t-1}$EXP$_{jt}$			0.027 (0.013)**	
φ_3 INSOLVENCY$_{j,t-1}$FDUM$_i$			-0.001 (0.001)	
β_2 NONPERFLOANS$_{j,t-1}$				-0.071 (0.008)***
γ_4 NONPERFLOANS_HI$_{j,t-1}$EXP$_{jt}$				0.105 (0.010)***
φ_4 NONPERFLOANS$_{j,t-1}$FDUM$_i$				-0.004 (0.009)
π_1 FDUM$_i$EXP$_{jt}$	0.030 (0.012)**	-0.014 (0.012)	0.022 (0.010)**	0.017 (0.013)
β_3 LEV$_{i,t-1}$	0.674 (0.007)***	0.661 (0.007)***	0.660 (0.007)***	0.636 (0.006)***
β_4 PROFIT$_{i,t-1}$	-0.003 (0.004)	-0.006 (0.004)	-0.011 (0.004)***	-0.008 (0.003)***
β_5 MTB$_{i,t-1}$	0.007 (0.001)***	0.008 (0.001)***	0.008 (0.001)***	0.007 (0.000)***
β_6 TAXES$_{i,t-1}$	0.000 (0.003)	-0.002 (0.003)	-0.001 (0.003)	0.003 (0.002)
β_7 DEPAMTA$_{i,t-1}$	-0.078 (0.024)***	-0.087 (0.024)***	-0.066 (0.020)***	-0.019 (0.014)
β_8 SIZE$_{i,t-1}$	0.010 (0.001)***	0.012 (0.001)***	0.011 (0.001)***	0.011 (0.001)***
β_9 TANG$_{i,t-1}$	0.015 (0.005)***	0.010 (0.005)*	0.013 (0.005)***	0.007 (0.004)*
β_{10} INDLEV$_{i,t-1}$	0.173 (0.026)***	0.180 (0.026)***	0.161 (0.025)***	0.163 (0.024)***
β_{11} LIQ$_{i,t-1}$	-0.003 (0.000)***	-0.003 (0.000)***	-0.003 (0.000)***	-0.003 (0.000)***
β_{12} SMC$_{j,t-1}$	-0.004 (0.001)***	-0.008 (0.001)***	-0.002 (0.001)**	-0.001 (0.001)
β_{13} BMC$_{j,t-1}$	0.004 (0.001)***	0.005 (0.001)***	0.000 (0.001)	0.005 (0.002)***
β_{14} MARKETDUM$_j$	0.016 (0.002)***	0.004 (0.002)	0.015 (0.002)***	0.012 (0.002)***
β_0 CONSTANT	-0.054 (0.006)***	-0.075 (0.006)***	-0.060 (0.005)***	-0.027 (0.004)***
$t_1 - H_0$: $\beta_1 + \gamma_1 = 0$	4.44 (0.013)***			
$t_2 - H_0$: $\beta_1 + \gamma_2 = 0$		2.73 (0.018)***		
z_1	11893.12 (17)	11810.88 (17)	13630.84 (17)	19238.92 (17)
z_2	760.90 (35)	1600.16 (35)	1162.01 (35)	1094.99 (35)
z_3	312.62 (8)	315.62 (8)	305.96 (9)	357.02 (14)
m_1	-33.15	-33.10	-35.25	-40.82
m_2	0.11	0.06	0.34	0.19
Hansen	2096.40 (608)	2078.64 (609)	2197.85 (696)	2866.25 (1148)

power and influence within the company to affect corporate decisions and to extract private benefits of control at the expense of other stakeholders (Berkman et al., 2009; Lins et al.,

2013). The risk of expropriation could be even more pronounced when the company becomes insolvent as the family may try to tunnel resources out of the business in an effort to preserve family wealth, with the negative consequences that this behavior entails for other stakeholders such as lenders.

Despite the importance of family control for debt decisions, there are other corporate governance characteristics that could affect firms' indebtedness preferences. In this respect, previous studies highlight the effect of managerial ownership and executive compensation on leverage choices (Agrawal & Nagarajan, 1990; Berger et al., 1997; Lewellen, 2006; Coles et al., 2006). Although the impact of managerial incentives associated with these governance dimensions is partly accounted for by the individual effect in the panel data estimations, we now explicitly control these effects to rule out the possibility that such governance dimensions are driving the relations confirmed in our main analyses.

To this aim, we collate additional data from the Orbis database. Given the difficulty to get detailed information on managers' stakes in the company and on executive compensation for a large international sample like ours, the new regression analyses are conducted using a smaller sample of 1,790 firms (16,515 firm-year observations) that covers 23 different countries. These are the firms and countries for which we can obtain the needed data. Considering the available information, we build two new variables that enable us to control for the impact of managerial ownership and executive compensation. Specifically, we first define a shareholder-manager dummy variable ($SHMDUM_i$) that takes the value of one if the controlling shareholder of the firm is also a manager, and zero otherwise. This is a good proxy measure that allows us to control for the effect of managerial ownership on firm debt in a large international sample of companies.

Second, we build a new dummy variable to account for the effect of managerial compensation on corporate leverage. It should be noted that information on executive compensation can be available for one or several managers of the company. To maximize sample coverage, we keep in the sample all firms for which information on compensation is available for at least one manager. To ensure reliability of data and comparability across firms, we only consider managers with total compensation exceeding 50,000 dollars per year. Additionally, we do not take into account compensation of employees that do not occupy managerial positions. Therefore, to control for executive compensation only the remuneration of directors that seem to be part of the top management team are considered (i.e., managers whose position in the company includes one of the following labels: *chairman*, *chief*, *executive*, *manager*, *president*, or *vice president*).

After identifying all firm employees that occupy managerial positions and for which compensation information is available, we compute the average of compensation of all managers and divide the resulting amount by total assets to scale the variable. Therefore, the measure we obtain is average managerial remuneration as a fraction of total assets. This variable is then used to divide the sample into firms with high versus low managerial compensation schemes compared to industry peers. In particular, we define a compensation high dummy variable ($COMPHIDUM_i$) that takes the value of one if a firm's average executive compensation is higher than average compensation in the sector in which the company operates, and zero otherwise. To classify firms in sectors, we use 2-digit SIC codes and only consider industries with at least 10 companies.

The two new variables ($SHMDUM_i$ and $COMPHIDUM_i$) are included in the set of control variables in the right-hand side of Equation (4), along with the family firm dummy

($FDUM_i$), and we re-estimate the four resulting models to test our hypotheses. Using a smaller sample that covers fewer countries could lead to weaker results given that our main variables of interest are country-level characteristics. However, despite the limitations from using a smaller sample, we continue to find support for the four hypotheses of the study.[3] Therefore, we conclude that our results are solid and that our main empirical findings continue to hold even when we control for governance characteristics of firms that could be relevant for corporate debt decisions.

In relation to the three new control variables included in the right-hand side of the models, results are in line with expectations and previous finance literature. First, we confirm that family firms use more long-term debt than nonfamily firms. Second, with respect to the effect of managerial ownership on firm indebtedness, we find that firms in which the controlling shareholder is also a manager exhibit lower debt levels. Our empirical evidence is consistent with the idea that managers with substantial stock ownership (and therefore lower diversified portfolios) consider debt as a costlier source of finance and hence prefer lower leverage (Strebulaev & Yang, 2013). Third, regarding the effect of executive compensation on debt, consistent with previous studies (e.g., Berger et al., 1997), our regression results indicate that leverage increases when managers receive higher compensation packages.

Overall, the findings obtained from the estimation of the extended capital structure models confirm our initial results. That is, even after controlling for family firm, managerial ownership and executive compensation effects, and accounting for the interaction effect of

[3] To save space, the new regression results are not reported in the paper, but they are available from the authors upon request.

family ownership with economic expectations and with the country-level variables that affect the existing risks in lending relationships, we still find support for the hypotheses of the study. Therefore, we conclude that, in countries with higher availability and quality of credit information and with better legal protection for borrowers and lenders, the positive effect of macroeconomic expectations on debt is less pronounced. By contrast, in environments where resolving insolvency takes longer and with higher rates of credit default, firms rely more strongly on positive economic forecast when asking for additional debt financing.

II.5.3. Alternative measure for the risk of default

With respect to the last stage of the lending process (i.e., the default stage), in the main specification we measure the risk of default at a country level with the ratio of nonperforming loans (i.e., debt contracts in which the debtor has not honor his commitments for at least 90 days) to total gross loans. Our results show that, in countries with a higher proportion of nonperforming loans, corporate leverage is more sensitive to macroeconomic expectations. But our findings may be biased in the sense that the nonperforming loans ratio we use only covers bank debt. To check whether this is indeed the case, we rerun the regression analyses for both bank-based and market-based economies separately.

It is worth noting that, while market-based countries in our sample only represent one third of the total number of countries, the percentage of firms and observations in market-based countries accounts for almost half of the sample (i.e., 54.19% of firm-year observations from bank-based economies vs. 45.81% of firm-year observations from market-based economies). In addition, as Column (4) in Panel A of Table 8 highlights, there

is a significant difference in the percentage of nonperforming loans between bank-based and market-based countries. As could be expected, the rate of default is higher in the subsample of firms that operate in bank-based countries, where it is likely that companies use bank debt more frequently. Consequently, to check whether our conclusions regarding Hypothesis 4 apply to both types of countries, we re-estimate the capital structure model for bank-based and market-based countries separately.

Panel B of Table 8 shows the direct effect of credit risk on leverage and its moderating role in the relation between expectations and corporate debt differentiating between the two types of economies. Columns (1) and (2) show the results for bank-based and market-based countries, respectively. As in previous estimations, we find a positive effect of economic growth forecast on firm debt (the coefficients on EXP_{jt} are positive and statistically significant with values of 0.089 and 0.040 in Columns (1) and (2), respectively; see $\hat{\beta}_1$). Consistent with our initial results, we also find that a higher fraction of nonperforming loans hampers companies' access to debt (the coefficients on $NONPERFLOANS_{j,t-1}$ are negative and statistically significant with values of –0.051 and –0.123 in Columns (1) and (2), respectively; see $\hat{\beta}_2$).

Interestingly, the interaction effect between the ratio of nonperforming loans and economic expectations on corporate leverage is not the same for the two subsamples. In line with our initial findings, higher risk of default leads to a stronger positive effect of expectations on debt in bank-based countries (the coefficient on $NONPERFLOANS\_HI_{j,t-1}EXP_{jt}$ is positive and statistically significant with a value of 0.144 in Column (1); see $\hat{\gamma}_1$). However, this indirect effect of the risk of default at a country level on debt is not observed in market-based

countries (the coefficient on$NONPERFLOANS_HI_{j,t-1}EXP_{jt}$ is statistically nonsignificant in Column (2); see $\hat{\gamma}_1$).

Table II.8. Robustness test. Effect of economic expectations and the amount of nonperforming loans on the book value of long-term debt differentiating between bank-based and market-based countries
Panel A reports a mean difference test between bank and market-based countries. Column (1) shows the mean for the total sample, Column (2) refers to the mean for bank-based economies and the mean for market-based countries is presented in Column (3). Column (4) shows the difference between both groups of countries. Panel B presents generalized method of moments regression results from:
$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_H NONPERFLOANS\_HI_{j,t-1})NONPERFLOANS_{jt} + \beta_2 S_{j,t-1} + \beta_X X_{i,t-1} + \beta_C C_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}$.
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 panel, see Table 5.

Panel A: Mean difference test	All firms	Bank-based	Market-based	*t*-statistic
	(1)	(2)	(3)	(4)
No. Obs.	107,141	58,060	49,081	
NONPERFLOANS 1	0.041	0.052	0.029	78.076***
Panel B: GMM regressions		(1)		(2)
		Bank-based		Market-based
β_1 EXPECTATIONS$_{jt}$		0.089 (0.017)***		0.040 (0.013)***
β_2 NONPERFLOANS$_{j,t-1}$		-0.051 (0.008)***		-0.123 (0.015)***
γ_1 NONPERFLOANS HI$_{j,t-1}$EXP$_{jt}$		0.144 (0.017)***		0.018 (0.013)
β_3 LEV$_{i,t-1}$		0.671 (0.007)***		0.613 (0.007)***
β_4 PROFIT$_{i,t-1}$		-0.008 (0.004)*		-0.006 (0.003)*
β_5 MTB$_{i,t-1}$		0.006 (0.000)***		0.007 (0.001)***
β_6 TAXES$_{i,t-1}$		0.000 (0.002)		0.010 (0.003)***
β_7 DEPAMTA$_{i,t-1}$		-0.005 (0.016)		-0.046 (0.016)***
β_8 SIZE$_{i,t-1}$		0.008 (0.001)***		0.012 (0.001)***
β_9 TANG$_{i,t-1}$		0.018 (0.005)***		0.022 (0.006)***
β_{10} INDLEV$_{i,t-1}$		0.165 (0.026)***		0.163 (0.030)***
β_{11} LIQ$_{i,t-1}$		-0.004 (0.000)***		-0.002 (0.000)***
β_{12} SMC$_{j,t-1}$		-0.003 (0.001)*		0.000 (0.001)
β_{13} BMC$_{j,t-1}$		0.003 (0.002)*		0.018 (0.003)***
β_0 CONSTANT		-0.010 (0.005)**		-0.044 (0.006)***
z_1		15031.29 (14)		11036.08 (14)
z_2		589.45 (23)		1201.75 (12)
z_3		288.56 (14)		456.78 (14)
m_1		-30.45		-28.05
m_2		0.79		-0.39
Hansen		1919.39 (960)		1728.11 (961)

These results question the validity of the measure we use to classify sample countries according to the risk of default. Consequently, we need to find a better proxy measure that is appropriate for countries in which bond markets play a more important role than banks as providers of debt financing. Such measure should be equally adequate for bank-based countries. Ideally, we would need a ratio that includes both nonperforming loans and defaults

in the bond markets. Unfortunately, we have not been able to find a ratio of this nature. Therefore, using the available information, we define an alternative measure that enables us to classify countries into those with higher and lower default rates and that is not unique to bank-based economies. More precisely, we opt for a measure that is based on firms' distress risk. In this alternative measure, the risk is due to weakness in the fundamentals of the company (such as low profitability), which poses a threat to business operations. In this regard, it is important to note that firms may temporarily reduce their distress risk by raising funds without improving their fundamentals, causing poor firm performance after funding (Yang et al., 2016) and resulting in a potential future default on debt payments.

In particular, we use the methodology of Pindado et al. (2008), which consists in estimating the ex-ante financial distress likelihood. Pindado et al. propose a definition of financial distress that evaluates a firm's capacity to satisfy its financial obligations. This definition allows the prediction of financial distress situations rather than bankruptcy for each firm-year observation. Subsequently, we aggregate the firm-level probabilities of financial distress into a single value for each country-year by calculating the average of the probability weighted by firm debt. The result is a measure of the probability of financial distress at a country level, $PROBDISTRESS_{j,t-1}$. This new measure is the country-specific variable, $S_{j,t-1}$, that we include in Equation (4) to test Hypothesis 4. Additionally, using this new variable we define the dummy variable $PROBDISTRESS\_HI_{j,t-1}$, which equals one for countries in which the likelihood of financial distress is in the upper tercile of the corresponding year, and zero otherwise. Therefore, the dummy variable takes the value of one for countries with higher default risk. This strategy enables us to test Hypothesis 4 as

we initially did with the nonperforming loans ratio, but using a country-level measure that is equally adequate for bank-based and market-based economies.

The initial step to build the $PROBDISTRESS_{j,t-1}$ variable is to identify firms that are in financial distress. According to Pindado et al. (2008), a company can be considered as financially distressed when two conditions are met: (i) its earnings before interests, taxes, depreciation, and amortization (EBITDA) are lower than its financial expenses for two consecutive years; and (ii) a fall in its market value occurs in two consecutive periods. The first condition identifies situations in which the firm cannot generate enough funds from its operating activities to comply with its financial obligations. The second condition captures the negative assessment of the company by the market and its stakeholders due to the operating fund deficit identified in the first condition. Note that we lose the initial year of the sample due to the need of computing differences in firm market value to define the second condition.

To predict financial distress, given that previous studies argue that a large set of variables is not necessary to achieve a higher level of efficiency (Zmijewski, 1984; Pindado & Rodrigues, 2004), we use the same three variables proposed by Pindado et al. (2008). These variables, which are closely related to financial distress, are: (i) profitability (a negative effect on financial distress is expected), (ii) financial expenses (a positive effect on financial distress is expected), and (iii) retained earnings (a negative effect on financial distress is expected). Additionally, we control for time effects with year dummies and we account for differences between bank-based and market-based countries with a dummy for market-based economies. Appendix A presents the description of the variables used in the analyses and their descriptive statistics.

Following Pindado et al. (2008), before estimating the probability of financial distress in cross sections, we must check the correct specification of the model. Therefore, we first estimate the financial distress model using a fixed effect panel data logit estimator. The regression results are presented in Appendix B. As can be seen, the coefficients on the three explanatory variables have the expected signs and affect the likelihood of financial distress significantly. After verifying that the model is correctly specified, we then proceed to estimate it in cross-sections for each year running logit regressions. Appendix C shows the results of the yearly logit estimations, which we use to predict the probability of financial distress for each firm. As explained in Pindado et al. (2008), the advantage of using this strategy to predict financial distress is that, unlike panel data estimations, in which the individual effects are eliminated by taking first differences of the model, cross-section estimations include the individual effect for each firm-year. Considering this effect increases the predictive power of the model.

Finally, we can define the country-level measure of default risk alternative to the nonperforming loans ratio initially used and we can estimate the model that allows us to test Hypothesis 4. Table 9 shows the new regression results differentiating between bank-based (Column (1)) and market-based countries (Column (2)). Consistent with all previous estimations, the expected performance of the economy has a positive effect on corporate debt (the coefficients on EXP_{jt} are positive and statistically significant with values of 0.083 and 0.175 in Columns (1) and (2), respectively; see $\hat{\beta}_1$). In addition, the new findings confirm that, regardless of the type of economy (bank-based or market-based), the risk of default, measured as the likelihood of financial distress at the country level, has a direct negative effect on firm debt (the coefficients on $PROBDISTRESS_{j,t-1}$ are negative and statistically

significant with values of –0.044 and –0.060 in Columns (1) and (2), respectively; see $\hat{\beta}_2$). These estimated coefficients are consistent with the original ones, when the proxy variable for the risk of default was the ratio of nonperforming loans to total loans.

Table II.9. Robustness test. Effect of economic expectations and the financial distress likelihood on the book value of long-term debt differentiating between bank-based and market-based countries

Generalized method of moments regression results from:

$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_H PROBDISTRESS\_HI_{j,t-1})EXP_{jt} + \beta_2 PROBDISTRESS_{j,t-1} + \beta_X X_{i,t-1} + \beta_C C_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}$.

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)
	Bank-based	Market-based
β_1 EXPECTATIONS$_{jt}$	0.083 (0.025)***	0.175 (0.051)***
β_2 PROBDISTRESS$_{j,t-1}$	-0.044 (0.008)***	-0.060 (0.028)**
γ_1 PROBDISTRESS HI$_{j,t-1}$EXP$_{jt}$	0.095 (0.025)***	0.154 (0.051)***
β_3 LEV$_{i,t-1}$	0.691 (0.008)***	0.626 (0.008)***
β_4 PROFIT$_{i,t-1}$	-0.007 (0.004)	-0.011 (0.004)***
β_5 MTB$_{i,t-1}$	0.006 (0.001)***	0.010 (0.001)***
β_6 TAXES$_{i,t-1}$	0.000 (0.002)	0.011 (0.003)***
β_7 DEPAMTA$_{i,t-1}$	-0.010 (0.019)	-0.038 (0.024)
β_8 SIZE$_{i,t-1}$	0.012 (0.001)***	0.014 (0.001)***
β_9 TANG$_{i,t-1}$	0.019 (0.005)***	0.008 (0.006)
β_{10} INDLEV$_{i,t-1}$	0.099 (0.028)***	0.168 (0.034)***
β_{11} LIQ$_{i,t-1}$	-0.006 (0.001)***	-0.003 (0.000)***
β_{12} SMC$_{j,t-1}$	-0.004 (0.001)***	-0.001 (0.001)
β_{13} BMC$_{j,t-1}$	0.004 (0.001)***	0.015 (0.003)***
β_0 CONSTANT	-0.023 (0.005)***	-0.059 (0.007)***
z_1	11676.89 (14)	9116.16 (14)
z_2	485.49 (23)	268.72 (12)
z_3	60.54 (12)	332.26 (12)
m_1	-23.79	-22.07
m_2	0.61	0.38
Hansen	1327.45 (803)	1264.6 (789)

More importantly, the new empirical evidence confirms that in countries where the likelihood of financial distress is higher, the positive effect of macroeconomic expectations on corporate leverage is more pronounced (the coefficients on $PROBDISTRESS\_HI_{j,t-1}EXP_{jt}$ are positive and statistically significant with values of 0.095 and 0.154 in Columns (1) and (2), respectively; see $\hat{\gamma}_1$). And this stronger positive effect exists not only in bank-based but also in market-based countries, unlike the results obtained previously using the nonperforming loans variable. Therefore, in line with Hypothesis 4, we

find that the positive effect of the expected performance of the economy on firm debt is stronger in countries with higher default risk (as captured by the likelihood of financial distress), regardless of whether the financial system is bank- or market-based.

II.6. Conclusions

Previous economics and finance literature investigates the effect of macroeconomic conditions on the debt decision of firms. We extend the coverage of prior research to a wider international sample that comprises developed and emerging economies, which enables higher heterogeneity in the macroeconomic context across countries. This study first shows that economic expectations affect firm leverage positively. More interestingly, our findings highlight that the risks inherent in the different stages of the lending process (i.e., adverse selection, moral hazard, and default risk) have a direct impact on corporate debt. However, the main contribution of this work is to show that these risks also affect firms' access to debt financing indirectly by moderating the pro-cyclical relation between the expected performance of the economy and leverage.

In particular, a higher level of transparency between lenders and borrowers and better legal protection of their rights facilitate indebtedness as they contribute to alleviate problems such as adverse selection and moral hazard. In addition, promoting better flow of information between the parties involved in lending relationships and ensuring that the rights of both lenders and borrowers are adequately protected help to mitigate the positive effect of economic expectations on firm leverage. These mitigating effects are especially beneficial during economic contractions.

By contrast, less efficient bankruptcy codes and high rates of credit default at a country level represent severe obstacles for corporate indebtedness. In this respect, our empirical evidence supports that the length of time it takes to resolve insolvency affects firm debt negatively. Similarly, the amount of nonperforming loans in the economy and the likelihood of financial distress represent an obstacle for firms' access to debt. The main reasons for these negative effects are the more severe moral hazard and default risk problems that longer insolvency procedures and high default rates generate. Lower efficiency of bankruptcy codes and higher rates of nonperforming loans also affect leverage indirectly by exacerbating the pro-cyclical effect of economic forecast on firm debt.

Our empirical evidence has important implications for policy-makers given their responsibility for creating proper macroeconomic conditions that facilitate the access of companies to debt financing. Whereas it is difficult to have a direct influence on economic expectations as they depend on how the economy as a whole evolves, they have the necessary power to shape and improve the institutional framework.

On the one hand, the results of the study provide compelling incentives to reduce the ex-ante risks of financial distress costs, adopting strategies such as the creation of public and private credit registries and the improvement of quality and availability of the history records contained in these registries. Similarly, governments should design collateral and bankruptcy laws, and modify the existing regulation in these areas, in such a way that the rights of lenders and borrowers are better protected. In particular, the strategies mentioned above will not only have a direct effect on the ability of firms to obtain external sources of funds, but they will also benefit companies by alleviating the sensitivity of their debt levels to the macroeconomic context.

On the other hand, failing to put in place procedures that contribute to speed up the resolution of insolvency and to reduce the amount of nonperforming loans would hamper firms' access to debt financing. Additionally, corporate borrowing would be more vulnerable to changes in macroeconomic expectations because, in environments with higher costs of insolvency and default risk, the pro-cyclical effect of the expected performance of the economy on corporate leverage is exacerbated. To avert this situation, policy-makers should lay the necessary foundations to alleviate the ex-post costs of financial distress. More precisely, they could take measures to assure the efficiency of insolvency regimes, while simultaneously promoting better credit risk management practices.

Appendix II.A. Firm characteristics considered in the definition of the PROBDISTRESS variable

PROBDISTRESS has been used as an alternative proxy for the risk of default to test Hypothesis 4. We define this variable following the methodology of Pindado et al. (2008) and using the same determinants proposed by these authors. This appendix contains the definition, data sources, and descriptive statistics of each variable.

Variable	Definition	Source	Mean	Std. Dev.
FD	Dummy variable equals one if the firm is financially distressed and zero otherwise. A firm is considered as financially distressed when: (i) its earnings before interests, taxes, depreciation, and amortization (EBITDA) are lower than its financial expenses for two consecutive years; and (ii) a fall in its market value occurs in two consecutive periods.	Worldscope	0.043	0.202
EBITDATA	EBITDA / Total assets in the previous year	Worldscope	0.068	1.314
FETA	Interest expenses on debt / Total assets in the previous year	Worldscope	0.014	0.109
RETA	Retained earnings in the previous year / Total assets in the previous year	Worldscope	0.198	1.148

Appendix II.B. Specification of financial distress model using panel data

Fixed effects panel data logit regression results from:

$$log\left(\frac{Prob(event)}{Prob(noevent)}\right) = \beta_0 + \beta_1 EBITDATA_{it} + \beta_2 FETA_{it} + \beta_3 FETA_{it} + \beta_4 MARKETDUM_{it} \;\; \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as χ^2 under the null of no relation, degrees of freedom in parentheses; and z_2 is a Wald test of the joint significance of the time dummies, asymptotically distributed as χ^2 under the null of no relation, degrees of freedom in parentheses. LR is the maximum likelihood ratio test of goodness-of-fit, asymptotically distributed as $\chi 2$ under the null of no joint significance of the coefficients, degrees of freedom in parentheses.

	(1)
β_1 $EBITDATA_{it}$	-1.846 (0.162)***
β_2 $FETA_{it}$	3.921 (1.299)***
β_3 $RETA_{it}$	-1.017 (0.519)**
β_4 $MARKETDUM_j$	1.601 (1.514)
z_1	134.98 (4)
z_2	137.69 (13)
LR χ^2	327.51 (17)

Appendix II.C. Yearly logit regressions used to predict financial distress likelihood

Cross-section logit regression results from:

$$log\left(\frac{Prob(event)}{Prob(noevent)}\right) = \beta_0 + \beta_1 EBITDATA_i + \beta_2 FETA_i + \beta_3 FETA_i + \beta_4 MARKETDUM_i + \varepsilon_i.$$

Standard errors are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. $pseudoR^2$ is a measure of the goodness of fit of the model that is equivalent to the R^2. $pseudoR^2 = \frac{-2LL_{null} - (-2L\ full)}{-2LL_{null}}$, where $-2LL$ is the likelihood value and where the null model is the one including only the constant. LR is the likelihood ratio statistic that tests the joint significance of the independent variables in the model, which is asymptotically distributed as χ^2 with degrees of freedom in parentheses under the null of the lack of joint significance. Observations stands for the number of observations included each year to run the cross-sectional logit model.

	2000	2001	2002	2003	2004	2005	2006
β_1 EBITDATA$_{it}$	-9.293***	-9.797***	-9.21***	-5.361***	-2.612***	-3.469***	-4.504***
β_2 FETA$_{it}$	7.83	-10.223*	2.486	-4.252	4.686	-2.039*	6.365***
β_3 RETA$_{it}$	-7.781***	-9.859***	-4.913***	-2.453***	-13.175***	-13.144***	-7.714***
β_4 MARKETDUM$_j$	0.372	0.415*	0.547***	0.041	0.699***	1.062***	1.25***
β_0 CONSTANT	-2.787***	-2.839***	-2.608***	-3.126***	-2.931***	-3.075***	-3.607***
Pseudo R-squared	0.368	0.373	0.362	0.201	0.234	0.299	0.310
LR	218.44	422.76	809.48	370.97	427.81	713.96	663.28
Observations	2,329	3,300	4,522	5,510	6,297	6,872	7,604

	2007	2008	2009	2010	2011	2012	2013
β_1 EBITDATA$_{it}$	-2.797***	-6.308***	-4.335***	-0.799***	-6.894***	-3.438***	-6.185***
β_2 FETA$_{it}$	8.211***	-1.189	7.528***	-2.113*	-7.475**	-0.162	-1.872
β_3 RETA$_{it}$	-8.128***	-5.555***	-5.096***	-10.324***	-5.512***	-6.89***	-4.057***
β_4 MARKETDUM$_j$	0.686***	0.695***	0.456***	0.641***	-0.143	0.759***	0.541***
β_0 CONSTANT	-2.972***	-2.612***	-2.696***	-2.781***	-2.554***	-2.915***	-3.197***
Pseudo R-squared	0.232	0.328	0.209	0.170	0.302	0.233	0.280
LR	528.26	1335.76	644.9	335.94	673.96	374.03	347.7
Observations	7,923	8,083	7,925	6,334	5,895	5,011	4,306

Chapter III

Monetary policy and banking system characteristics

III. 1. Introduction

Capital structure continues to attract scholars' attention in the economics and finance fields. Despite the theoretical and empirical advances that allow us to better understand this corporate decision, recent studies make us question what we know in this area. In particular, Graham, Leary, & Roberts (2015) study the evolution of corporate leverage over the last century in the United States. They find some important changes in leverage policies that firm characteristics are not able to explain. With the exception of size and profits volatility, the effects of other firm-level factors on a firm's capital structure have remained relatively stable over time. The results obtained by these authors show that only a small fraction of the new debt can be explained by changes in firm characteristics. This finding suggests the possibility of misspecification problems in the empirical models proposed in earlier works. Not only some unidentified variables may have been omitted, but also environmental factors may have received scarce attention in most previous studies. By carefully analyzing how macroeconomic and institutional factors affect the capital structure decision, we could better understand the changes in corporate financial policy over the last century (Graham et al., 2015).

Among the macroeconomic factors that affect firm debt, the monetary policy deserves special attention since its influence on bank lending rates has increased over time (Kwapil & Scharler, 2013). In addition, recent empirical evidence shows that an adverse credit supply shock will have negative consequences for the business environment. Such a shock will first lead to a substantial reduction in the capacity of firms to borrow from banks; it will then increase the corporate bond credit spread; and it will finally end up in a significant decline in real GDP (Bassett, Chosak, Driscoll, & Zakrajšek, 2014).

Supporting the relevance of the monetary policy, there is a strand of research that investigates its impact on financial markets. Specifically, Sellin (2001) offers an extensive review and highlights that most empirical research in the field focuses on whether the monetary policy helps to predict the behavior of financial markets. Although evidence is inconclusive, most recent studies show that there is a positive relation between an expansionary monetary policy and market trends. Despite the importance of monetary policy for corporate decision making, few works focus on how it affects firm leverage.

However, some previous research analyzes how country-specific characteristics moderate the effectiveness of the monetary policy. For instance, Aysun, Brady, & Honig (2013) find that, in environments with higher financial frictions (i.e., higher bankruptcy recovery rates), the effectiveness of the monetary policy increases. Cecchetti (1999) finds that, in countries with legal origins that better protect the rights of creditor, the transmission of monetary policy measures is weaker. In addition, the effectiveness of monetary policy measures is higher with greater independence of central banks (Mishra, Montiel, & Spilimbergo, 2012), while they are less effective when financial markets are more developed (Elbourne & de Haan, 2006). Belke, Freytag, Keil, & Schneider (2014) go beyond the central

bank independence criteria and find that commitment and consistency of the monetary policy are factors that determine its success. In a similar vein, Baeriswyl & Cornand (2010) study the optimal design of the monetary policy in different scenarios of transparency and analyze how the communication strategy of central banks regarding monetary measures should be considered in the design of this policy.

Using an international sample that includes developed and emerging economies, our objective is to investigate the effect of expansionary and contractionary monetary policies on corporate leverage. We go a step further and also investigate how the characteristics of the banking system moderate the relation between the monetary policy and firm debt. To achieve our goal, we use the panel data method in the estimation process as it allows us to control for unobservable heterogeneity. We could reach biased conclusions if we did not control for this problem. In our particular case, there is an individual effect that is not observable to us, such as managers' risk aversion to raising more expensive debt due to possible inflation rises caused by increases in the money supply. More specifically, an expansionary monetary policy is expected to affect inflation differently. That is, either inflation could increase or it could remain constant when the amount of money available in the economy increases. Therefore, it is impossible for researchers to know the point of view and the expectation of each manager in this regard. However, even though managers' theoretical point of view cannot be observed, it is likely to remain constant over time.

Our empirical evidence supports a nonlinear relation between the monetary policy and corporate debt. Specifically, the relation exhibits an inverted U-shape. An increase in the money supply facilitates firms' indebtedness because of the higher liquidity in the market. However, there is an optimal level beyond which additional growth in the monetary

aggregate has the opposite effect. From this level onwards, further expansionary measures discourage firms from borrowing because of the risk of inflation, which would in turn lead to increases in interest rates making debt more expensive.

Nevertheless, the characteristics of the banking system influence the intensity of the effect of the monetary policy on firm debt and determine the level of growth in the monetary aggregate that is necessary to maximize firms' access to debt financing. In particular, if there is higher liquidity in the hands of banks, the impact of an expansionary monetary policy on debt is mitigated and the inflection point at which the relation between both factors turns from positive to negative is reached at a higher level. By contrast, in countries where banks allocate a higher fraction of their resources to private credit, the effect of the monetary policy on firm debt is more pronounced, reducing the amount of money supply that is necessary to maximize corporate leverage.

This study makes several contributions to the economics and finance literature. First, we contribute to capital structure research by empirically investigating a nonlinear relation between the monetary policy and corporate leverage. Our empirical design enables us to go a step further and add new insight to the traditionally accepted view that expansionary monetary measures and corporate leverage are positively related. Unlike prior research, we can disentangle whether there is a level of money supply beyond which the monetary policy discourages managers from taking on additional debt. If our expectations are confirmed, it would imply that central banks should consider the potential detrimental consequences of an excessive increase in the amount of money when designing the monetary policy.

Second, unlike most previous studies that focus on the implications of changes in the monetary policy for other macroeconomic variables, financial market indices and firm

market value, which are usually carried out in a single-country context, we study the effects of an expansionary monetary policy on corporate debt in an international context. Covering several and diverse countries, including both developed and emerging economies, will increase the variability in our money supply measure. As a consequence, we can obtain more robust and stronger results that can be generalized more easily.

Third, we investigate whether country-level factors associated with the banking system moderate the effect of the monetary policy on firm debt. In this regard, we complement previous studies that analyze whether the effectiveness of the monetary policy depends on different environmental characteristics. However, none of these works considers the possibility that the effect of the monetary policy as a tool to facilitate firms' access to debt financing depends on the characteristics of the banking system. Hence, we contribute to this strand of research.

Finally, by using the panel data methodology, we are able to control for unobservable heterogeneity, which is a problem that affects most economics and finance models and which could lead to biased results if it is not taken into consideration. In particular, in this type of study it is not possible for researchers to observe the point of view and expectation of each manager, which are very important when analyzing the debt decisions made by each manager. The panel data methodology allows us to address this problem, since the point of view and expectation of each manager is captured in the models as unobservable heterogeneity that remains constant over time.

The remainder of the paper is organized as follows. Section 2 reviews previous literature and develops the testable hypotheses. The data, variables and estimation method

are described in Section 3. Sections 4 and 5 present the results and the robustness tests, respectively. Section 6 summarizes the main results and concludes.

III.2. Theory and hypothesis development

The monetary policy comprises a set of instruments managed by central bank, all of which seek to adjust interest rates and/or money supply to stabilize the economy. The instruments most frequently used by central banks are related with the management of short term rates, changes in reserve requirements for commercial banks and open market operations. This last instrument basically consists in buying or selling government bonds in the open market. However, none of these actions would have the effect intended by monetary authorities without an adequate mechanism of transmission of the monetary policy. According to previous economics literature (Bernanke & Gertler, 1995; Kashyap & Stein, 2000; Kiyotaki & Moore, 1997; Korajczyk & Levy, 2003), the bank lending channel and the balance sheet channel are the most important mechanisms of transmission of the monetary policy. The first channel refers to the possible effects of monetary policy actions on the supply of loans by depository institutions, while the second channel stresses the potential impact of an economic slowdown on the balance sheet of borrowers.[4]

Regardless of the transmission mechanism, previous studies that analyze the relation between monetary policy measures and the value of the firm document a decrease in stock market returns, and subsequently a reduction in stock prices, following a monetary policy tightening (Bernanke & Kuttner, 2005; Gust & López-Salido, 2014; Patelis, 1997;

[4] For a detailed description and a review of the literature on the bank lending channel and the balance sheet channel, see Bernanke & Gertler (1995).

Thorbecke, 1997; Tsai, 2014). Nevertheless, Belke & Beckmann (2015) find that this widely accepted relation between money supply and stock prices is very limited in developed economies. This relation is driven by the influence of the monetary policy on the discount rate used to compute the present value of cash flows from equity (i.e., dividends) or by its effect on financial leverage. Note that changes in reference interest rates affect the financing costs of firms that issue debt (Gospodinov & Jamali, 2015). Indeed, one of our main goals is to investigate the relation between the monetary policy and corporate leverage.

III.2.1. Effect of the monetary policy on corporate debt

Although most literature supports a positive effect of the monetary policy on debt (Berger & Udell, 1998; Gertler & Gilchrist, 1993; Gertler & Gilchrist, 1994), Cooley & Quadrini (2006) suggest the possibility of a non-linear relation between increases in money supply and corporate debt. In their theoretical model, the response of firms' leverage to monetary shocks is subject to a trade-off between the benefits of extra financing against the higher volatility of profits caused by new debt. On the one hand, additional debt allows firms to expand their production scale, thus increasing their expected profits. On the other hand, firms are averse to more volatile profits.

The impact that an expansionary monetary policy may have on inflation also supports the possibility of an inverted U-shape effect of the monetary policy on firms' debt. In this regard, Fan, Titman, & Twite (2012) claim that the interest rate charged for debt is generally set in nominal terms in the debt contract and high inflation, which is generally associated with high uncertainty about future expected inflation, may discourage lenders from using

additional long-term debt. Additionally, there is cross-country evidence that shows that inflation affects debt negatively (Öztekin & Flannery, 2012).

Due to the different theoretical perspectives on the consequences of an expansionary monetary policy, there is still no consensus among economists about the effects of an increase in the amount of money. On the one hand, the Federal Reserve and the Bank of England follow the orthodox approach and consider that inflation is determined by the Phillips Curve as a function of current output against its potential level (Lothian, 2014). From this perspective, the amount of money in the economy is irrelevant for inflation since this should not increase if output is below its potential level and under the assumption that inflation expectations remain constant. According to Lothian (2014), this school of thought believes that an increase in inflation due to expansionary policies is an exaggerated and unsubstantiated concern. Otherwise, inflation should have risen in countries where central banks increased liquidity to counteract the consequences of the global financial crisis that began in 2007 in the United States and that spread to other countries in the following years.

On the other hand, there is another school of thought led by the European Central Bank which considers that an increase in the amount of money entails the risk of a sharp increase in inflation, unless this policy is reversed by subsequent contractionary measures (Lothian, 2014). This approach is supported by previous studies that state that in the long run high rates of money growth result in high inflation rates, because in the long term the Phillips Curve is vertical or positive sloping instead of downward sloping (Fischer & Sahay, 2002; Haug & Dewald, 2012; Lothian, 1985; Lothian & McCarthy, 2009). Consequently, although an expansionary monetary policy initially facilitates corporate indebtedness, an excessive increase in the amount of money will have the opposite effect. A monetary policy that is too

aggressive can discourage the use of debt because of the possible rise in interest rates, which would in turn increase the cost of debt. In this scenario, firms prefer to replace debt with less risky funds, such as their cash holdings. Therefore, we propose:

H1. An expansionary monetary policy increases firm leverage when the amount of money in the economy is low, but discourages the use of debt when the amount of liquidity exceeds the optimal level.

III.2.2. Role of the banking system in the relation between the monetary policy and corporate leverage

When studying how an expansionary monetary policy affects firm debt, it is necessary to consider whether country-specific characteristics moderate this effect. The features of the banking system are likely to play an important role in this regard. For instance, Tan, Yao, & Wei (2015) highlight that in bank-based systems firms are more vulnerable to liquidity shocks compared to companies that operate in market-based systems. The main reason for this finding lies in the larger number of investors that could lend money to firms in market-based systems. Even if some of the potential lenders were hit by the liquidity shock, firms could borrow from the remainder providers of funds. In this regard, Massa & Zhang (2013) find that debt inflexibility facilitates the transmission of monetary policy measures, because when companies face difficulties to access the bond market, firms' dependence on banks increases.[5] Ramos-Tallada (2015) points out the importance of the bank lending channel by

[5] Debt inflexibility is defined as the inability to replace bank loans with bonds.

showing that the effectiveness of the monetary policy as a tool to stabilize inflation increases when the amount of bank credit supply is higher.

Kwapil & Scharler (2013) reinforce the abovementioned idea. They find that the monetary policy is becoming more predictable and credible, because the role of banks in its transmission has recently become more important. Thus, banks are more likely to adjust their interest rates if they believe that a change in monetary policy rates will not be reversed soon (Kwapil & Scharler, 2013). Anticipating future monetary policy measures may help banks by reducing costs associated with interest rates adjustment (Hannan & Berger, 1991; Hofmann & Mizen, 2004). In this context, changes in the monetary policy are transmitted faster and, to a greater extent to lending rates, due to the ability of monetary policy measures to influence private sector expectations (Galí & Gertler, 2007; Goodfriend, 1991; Woodford, 2003).

We consider two characteristics of financial institutions to investigate the role that the banking sector plays in the relation between the monetary policy and corporate leverage: (i) the amount of banks' liquid reserves and (ii) the allocation of banks' funds (i.e., to either the private or the public sector). Note that monetary policy measures change the reserves available to the banking system, which in turn affect the supply of loans (Aysun et al., 2013). Such effect should be more pronounced if firms rely more heavily on bank financing (Agénor & da Silva, 2014; Bean, Larsen, & Nikolov, 2002; Cecchetti, 1999; Kashyap & Stein, 1997).

III.2.2.1. Effect of banks' liquidity

Since greater bank dependence increases the effect of changes in the amount of money, companies with banks as their main lenders will have greater incentives to stockpile cash in an attempt to protect themselves from possible monetary shocks (Tan et al., 2015). According to Cecchetti (1999), the stronger dependence on monetary policy measures when banks are the main providers of funds is due to the effect of the monetary policy on bank reserves, which are closely related to the resources that banks have available to lend.

However, the overall situation of the baking system, such as the level of liquidity of banks, can mitigate the effect of bank dependence on the relation between the monetary policy and corporate debt. In this regard, Bassett et al. (2014) argue that banks with higher liquidity can better absorb monetary shocks and therefore they do not need to tighten their lending standards or, if they need to tighten the conditions, at least they can do it gradually during periods of financial turmoil. This is consistent with Ramos-Tallada (2015), who shows that a high ratio of liquid assets is among the factors related with banks' financial structure that are likely to reduce the efficiency of monetary policy measures.

As a consequence, we expect that higher levels of banks' liquidity reduce the efficiency of the bank lending channel, so that the monetary policy has a less important role as a mechanism to facilitate corporate indebtedness. Thus, we formulate that:

H2. Higher liquidity in the banking system mitigates the effect of the monetary policy on firms' debt.

III.2.2.2. The allocation of loan portfolio

In the same way that the level of liquidity of banks can modify the intensity at which the monetary policy is transmitted, the distribution of banks loan portfolio is another relevant factor that may intensify (or reduce) the effect of monetary shocks on corporate debt. In this respect, banks may choose to provide their resources to either public or private entities, although they typically lend to both types of institutions.

Recently, Graham et al. (2015) find that one of the most robust relations confirmed in the capital structure literature is the negative association between corporate leverage and government leverage. Their evidence reveals that, when governments reduce their debt issues, companies increase their use of debt relative to equity, resulting in an increase in corporate leverage.

Similarly, Becker & Ivashina (2014) find that contractionary monetary policy measures often lead firms to explore new financing alternatives for raising funds. A common alternative is switching from bank loans to bond issues. However, in environments where the loan portfolio is usually concentrated on private credits, the bond market is likely to be dominated by public debt because governments and other public authorities get fewer resources from the banking sector. This situation hampers the ability of private entities to raise funds in the bond market due to the high degree of competition they face. This finding is consistent with previous studies that support that the financing of the government deficit crowds out corporate debt financing as a result of competition for investor funds (Friedman, 1986).

In light of these arguments, our expectation is that in environments where the loan portfolio of banks is mainly composed of private debt, the level of competition for bank

financing faced by firms will be lower and the monetary policy will be transmitted more efficiently. Therefore, our final hypothesis proposes that:

H3. When private credit represents a higher proportion of banks' loan portfolio, the effect of the monetary policy on firm debt is more pronounced.

III.3. Data, variables, and estimation method

III.3.1. Data sources and sample

To test the hypotheses previously proposed, we need two types of information (firm and country-specific), which we obtain from two 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 need the monetary aggregates for each country of the sample, as well as the amount of banks' liquid reserves and the private credit provided by banks, to empirically measure banking system characteristics in each country. We get this information from the World Bank website. The historical GDP of each country, which is included as a control variable in the models, is also obtained from this website. Table 1 presents the definitions of the variables and the data sources used to compute them.

Table III.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	Long-term debt / Total assets	Worldscope
MARKET VALUE OF LEV	Long-term debt / (Total assets - Book value of equity + Market capitalization)	Worldscope
MAGR	Average annual growth rate in money and quasi money	World Bank
BANKLIQ	Bank liquid reserves to bank assets ratio (%)	World Bank
PCREDIT	Domestic credit to private sector provided by banks (% of GDP)	World Bank
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
GDPGROWTH	Annual growth of nominal GDP	World Bank

The countries and years considered in our regression analyses vary slightly across models because of the availability of the country-level data that we need to test each of our three hypotheses. Information on the monetary aggregate growth (Hypothesis 1) is available for all countries and years for which firm-level data are available. We get data on banks' liquidity (Hypothesis 2) for 28 countries of the sample since 2001. Meanwhile, data on private credit provided by banks are available for all countries of the sample since 1999, with some missing information in some years for some countries. However, it should be noted that we lose the initial year because the 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.

Table III.2. Distribution of the sample by year

This table shows the number of observations by year. Data are extracted for companies for which information is available for at least five consecutive years between 1999 and 2013 in the Worldscope database. The availability of country-level data in the website of the World Bank determines the size of the sample used to test each hypothesis.

	Hypothesis 1		Hypothesis 2		Hypothesis 3	
	Observations	%	Observations	%	Observations	%
1999	2,313	2.39	0	0.00	2,263	2.39
2000	3,065	3.17	0	0.00	3,005	3.17
2001	4,594	4.76	2,996	5.20	3,961	4.18
2002	5,564	5.76	3,650	6.34	5,517	5.82
2003	6,414	6.64	4,239	7.36	6,367	6.72
2004	7,101	7.35	4,737	8.22	7,055	7.45
2005	7,784	8.06	5,205	9.04	7,731	8.16
2006	8,371	8.67	5,649	9.81	8,341	8.81
2007	9,038	9.36	5,793	10.06	8,990	9.49
2008	9,172	9.50	5,799	10.07	9,087	9.59
2009	8,881	9.20	5,371	9.33	8,792	9.28
2010	7,178	7.43	4,250	7.38	6,968	7.36

2011	6,605	6.84	3,874	6.73	6,419	6.78
2012	5,597	5.80	3,235	5.62	5,446	5.75
2013	4,904	5.08	2,796	4.85	4,782	5.05
Total	96,581	100.00	57,594	100.00	94,724	100.00

The final full sample contains 10,839 listed companies (96,581 firm-year observations) and spans the years 1999 to 2013, covering 37 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-digits SIC codes 49 and 60). The distribution of the sample by country is presented in Table 3.

Table III.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 information is available for at least five consecutive years between 1999 and 2013 in the Worldscope database. The availability of country-level data in the website of the World Bank determines the size of the sample used to test each hypothesis.

	Hypothesis 1		Hypothesis 2		Hypothesis 3	
	Firms	Average number of observations per firm	Firms	Average number of observations per firm	Firms	Average number of observations per firm
Argentina	30	10	0	0	30	10
Australia	389	9	380	9	389	9
Austria	33	10	33	10	33	10
Belgium	53	10	53	10	51	9
Brazil	103	8	102	8	103	8
Canada	310	10	216	7	265	8
Chile	75	11	75	10	75	11
China	1,240	11	0	0	1,240	11
Colombia	9	9	8	9	9	9
Czech Republic	4	11	4	10	4	11
Denmark	64	10	57	9	64	10
Finland	81	11	80	10	79	9
France	360	10	360	10	347	9
Germany	314	9	314	9	298	9
Greece	126	8	125	8	126	8
Hong Kong	476	10	0	0	476	10
Hungary	12	11	11	10	12	11
India	954	7	0	0	954	7
Indonesia	119	9	119	9	119	9
Ireland	31	11	29	10	28	9
Israel	81	9	0	0	81	9
Italy	108	9	106	9	105	9

Japan	1,669	11	1,632	10	1,669	11
Malaysia	519	10	511	9	519	10
Mexico	67	11	64	10	67	11
Netherlands	88	10	88	10	84	9
Norway	61	9	0	0	34	7
Poland	91	8	87	7	91	8
Portugal	27	10	27	10	25	10
Singapore	267	8	0	0	267	8
South Africa	158	12	154	11	158	12
Spain	70	10	70	10	68	10
Sweden	132	11	120	10	132	11
Switzerland	124	11	0	0	124	11
Turkey	126	11	126	10	126	11
United Kingdom	576	10	0	0	576	10
United States of America	1,892	10	1,697	9	1,892	10
Total	10,839		6,648		10,720	

III.3.2. Model specification

We estimate a partial adjustment model of debt that follows the specification proposed by Flannery & Rangan (2006), Öztekin & Flannery (2012) and Keasey, Martinez, & Pindado (2015), 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 long-term debt of the company *i* at the end of year *t* (Cantillo & Wright, 2000; Giannetti, 2003; Kim & Sorensen, 1986; Korajczyk & Levy, 2003; Marsh, 1982; Miguel & Pindado, 2001; Titman & Wessels, 1988). 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 long-term debt, while in the robustness tests we estimate the models using the market value of long-term debt.

We use a long-term debt measure because it is especially suitable when investigating the effect of macroeconomic factors on a firm's capital structure (Korajczyk & Levy, 2003). Long-term debt is the dependent variable in our regression analyses because the factors that affect short- and long-term debt are different (Pindado, Rodrigues, & de la Torre, 2006). Therefore, we should avoid mixing both debt types in the model because this could lead to biased results. LEV_{it}^{*} is the target value of long-term debt of firm *i* at the end of year *t*; λ is the speed of adjustment of leverage to the firm's desired level; and ε_{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:

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

where $C_{j,t-1}$ and $F_{i,t-1}$ includes country-specific and firm-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. Given that the expectation of each manager is unobservable heterogeneity that remains constant over time, we control for it with the individual effect, η_i. Finally, υ_{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:

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

The λ 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:

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

The set of country-specific variables comprises the monetary policy measure and its square, and the gross domestic product of each country. In particular, $MAGR_{j,t-1}$ is the average annual growth rate in the monetary aggregate, which captures the overall monetary conditions in each country (Berkman, 1978; Cornell, 1983; Hafer, 1986; Hardouvelis, 1987; Lynge Jr, 1981; Pearce & Roley, 1983; Pearce & Roley, 1985). A positive value of $MAGR_{j,t-1}$ indicates an expansionary monetary policy, while a negative value represents a contractionary monetary policy. Additionally, in line with previous studies (De Jong, Kabir, & Nguyen, 2008; Frank & Goyal, 2009; Öztekin & Flannery, 2012), we control for the annual growth in nominal GDP ($GDPGROWTH_{j,t-1}$).

The remaining variables included in the right-hand side of all empirical specifications contains the following firm-level characteristics, which are also important determinants of

corporate debt: 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); and liquidity ($LIQ_{i,t-1}$), measured as short-term assets over short-term liabilities (Öztekin & Flannery, 2012). Table 4 reports the main descriptive statistics of all variables considered in the analyses.

Table III.4. Summary statistics
This table presents the main descriptive statistics of the dependent, country-specific, and firm-specific variables used in the analyses.

	Mean	Std. Dev.	Minimum	Median	Maximum
BOOK VALUE OF LEV	0.1070	0.1237	0.0000	0.0620	0.6986
MARKET VALUE OF LEV	0.0914	0.1123	0.0000	0.0479	0.6990
MAGROWTH	0.0904	0.0859	-0.1973	0.0815	1.0199
BANKLIQ	0.0574	0.0799	0.0020	0.0241	0.4087
PCREDIT	0.9483	0.4058	0.0860	0.9984	2.0229
PROFIT	0.0915	0.1323	-1.9251	0.0983	1.7569
MTB	1.2449	0.9681	0.0000	0.9332	7.0000
TAXES	0.2287	0.1970	-0.7000	0.2632	0.7000
DEPAMTA	0.0389	0.0306	0.0000	0.0326	0.4979
SIZE	5.5232	1.8804	0.0030	5.3810	12.7458
TANG	0.3638	0.1906	0.0300	0.3549	0.8000
BOOK VALUE OF INDLEV	0.1159	0.0369	0.0301	0.1069	0.4110
MARKET VALUE OF INDLEV	0.1008	0.0391	0.0249	0.0944	0.3823
LIQ	2.0796	1.6026	0.0012	1.5965	14.9999
GDPGROWTH	0.0367	0.0383	-0.0854	0.0295	0.1524

We detail the set of country-specific variables in Equation (4) to obtain the empirical specification that enables us to test Hypothesis 1:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + \beta_1 MAGR_{j,t-1} + \beta_2 MAGR^2_{j,t-1} + \beta_3 GDPGROWTH_{j,t-1} + \beta_F F_{i,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}. \quad (5)$$

Regarding the expected relations in Equation (5), we should find that $\hat{\beta}_1 > 0$ and $\hat{\beta}_2 < 0$ to get support for a nonlinear relation between monetary policy and corporate leverage, as proposed in Hypothesis 1. If our expectation is confirmed, we could conclude that an expansionary monetary policy encourages indebtedness as long as the level of liquidity in the economy does not exceed the optimal level.

Moreover, to test the second and third hypotheses of the study, we extend Equation (5) by interacting the monetary policy and its square with the corresponding dummy variable, $DUMMY\_S_{j,t-1}$, as follows:

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

Before explaining the meaning of the $DUMMY\_S_{j,t-1}$ variable included in the specification proposed to test Hypotheses 2 and 3, we rearrange the variables of interest and also simplify the coefficients' notation as in Equation (7):

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + \left(\beta_1 + \gamma_H DUMMY\_S_{j,t-1}\right) MAGR_{j,t-1}$$
$$+ \left(\beta_2 + \gamma_H DUMMY\_S_{j,t-1}\right) MAGR^2_{j,t-1} + \beta_3 GDPGROWTH_{j,t-1} + \beta_F F_{i,t-1}$$
$$+ \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}. \quad (7)$$

With respect to this last equation, we use two empirical specifications to test our second and third hypotheses. First, to test Hypothesis 2, we replace the $DUMMY\_S_{j,t-1}$ variable with $BANKLIQ\_HI_{j,t-1}$, which equals one for countries with a value of the bank liquid reserves to bank assets ratio higher than the sample median, and zero otherwise. Hence, the dummy variable takes the value of one for countries whose banks exhibit higher liquidity. We obtain information about banks' liquid reserves from the World Bank website.

To test Hypothesis 3, we substitute $PCREDIT\_HI_{j,t-1}$ for $DUMMY\_S_{j,t-1}$ in Equation (7). The $PCREDIT\_HI_{j,t-1}$ dummy variable takes the value of one for countries with credit to private sector provided by banks higher than the sample median, and zero otherwise. Thus, the dummy variable is one for countries with a higher level of private credit. We obtain information about domestic credit to private sector by banks (as a percentage of GDP) from the World Bank website.

With respect to Hypothesis 2, which we test using a modified version of Equation (7), the moderating effect of banks' liquidity in the relation between firm leverage and the monetary policy is measured with the interaction terms $BANKLIQ\_HI_{j,t-1}MAGR_{j,t-1}$ and $BANKLIQ\_HI_{j,t-1}MAGR^2_{j,t-1}$. Now, two cases should be considered. First, for firms that operate in countries where the value of banks' liquid reserves is below the sample median, the effect of the monetary policy on firm debt is captured by β_1 and β_2 (given that

$BANKLIQ\_HI_{j,t-1}$ = 0). Second, in countries where banks have higher levels of liquid reserves, the impact is evaluated by $(\beta_1 + \gamma_1)$ and $(\beta_2 + \gamma_2)$ (given that $BANKLIQ\_HI_{j,t-1}$ = 1). Therefore, if Hypothesis 2 is to be confirmed, the empirical results need to comply with two conditions. The first condition refers to the nonlinear relation. That is, we expect that $\hat{\beta}_1 + \hat{\gamma}_1 > 0$ and $\hat{\beta}_2 + \hat{\gamma}_2 < 0$. The second condition is related with the intensity of the effects, which in turn affects the inflection point at which increases in the money supply discourage the use of debt. In this regard, we expect that $-(\hat{\beta}_1)/2(\hat{\beta}_2)$[6] < $-(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$[7] to support the expectation that a higher level of banks liquid reserves mitigates the impact of an expansionary monetary policy on corporate debt, as formulated in Hypothesis 2.

Finally, to test Hypothesis 3 we use another empirical model based on Equation (7) in which the interactions terms $PCREDIT\_HI_{j,t-1}MAGR_{j,t-1}$ and $PCREDIT\_HI_{j,t-1}MAGR^2_{j,t-1}$ capture how the amount of private credit provided by banks moderates the effect of an increase in money supply on corporate debt. On the one hand, in countries where the amount of resources lent by banks to the private sector is lower, the effect of the monetary policy on firm debt is β_1 and β_2 (given that $PCREDIT\_HI_{j,t-1}$ = 0).

[6] To obtain the inflection point of the growth rate in the monetary aggregate, it is necessary to compute the first order derivative of leverage with respect to the monetary aggregate variable using Equation (5) and then equal to zero: that is, $\frac{dLEV_{it}}{dMAGR_{j,t-1}} = \hat{\beta}_1 + 2\hat{\beta}_2 MAGR_{j,t-1} = 0$, which implies that the optimal level of money supply at which leverage is maximized is: $MAGR_{j,t-1} = -\hat{\beta}_1/2\hat{\beta}_2$.

[7] To obtain the inflection point of the growth rate in the monetary aggregate when the country-specific dummy variable equals one, it is necessary to compute the first order derivative of leverage with respect to the monetary aggregate variable using Equation (7) and then equal to zero: that is, $\frac{dLEV_{it}}{dMAGR_{j,t-1}} = (\hat{\beta}_1 + \hat{\gamma}_H) + 2(\hat{\beta}_2 + \hat{\gamma}_H)MAGR_{j,t-1} = 0$, which implies that the optimal level of money supply at which leverage is maximized is: $MAGR_{j,t-1} = -(\hat{\beta}_1 + \hat{\gamma}_H)/2(\hat{\beta}_2 + \hat{\gamma}_H)$.

On the other hand, in countries with higher levels of private credit provided by banks, the effect of an expansionary monetary policy on leverage is $(\beta_1 + \gamma_3)$ and $(\beta_2 + \gamma_4)$, (given that $PCREDIT\_HI_{j,t-1}$ = 1). Consequently, we first expect that $\hat{\beta}_1 + \hat{\gamma}_3 > 0$ and $\hat{\beta}_2 + \hat{\gamma}_4 < 0$ to confirm a nonlinear relation between the monetary policy and firm debt regardless of the type of country. However, to confirm that the impact of monetary policy measures on corporate leverage is stronger in economies where the amount of private credit provided by banks is higher, we also expect that $-(\hat{\beta}_1)/2(\hat{\beta}_2) > -(\hat{\beta}_1 + \hat{\gamma}_3)/2(\hat{\beta}_2 + \hat{\gamma}_4)$, which would support Hypothesis 3.

III.3.3. Estimation method

As Equations (2) and (3) highlight, unobservable heterogeneity is an important determinant of target debt. Therefore, we use the panel data methodology in the estimation of our different specifications. By controlling for this individual effect, we are able to alleviate the risk of obtaining biased results. Specifically, we assume that each company has its own characteristics that affect the decision-making process and remain constant over time but are unobservable to the researcher.

In addition to the unobservable heterogeneity problem, the explanatory variables described above may be correlated with the error term, which would create an endogeneity problem. To control for this problem, 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 model complies with the stationarity assumption since the correlation between the explanatory variables and the unobservable 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 $t-4$ for all the right-hand side variables as instruments for the equations in differences (except for the lagged variable, $LEV_{i,t-1}$, which is assigned lags from $t-3$ to $t-5$) and only one instrument for the equations in levels, as suggested by Blundell & Bond (1998).

Given that we use the GMM estimator, we 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 the joint significance of the reported coefficients, as well as of the country and time dummies.

III.4. Results

Table 5 presents the regression results that enable us to test our hypotheses. Specifically, Column (1) shows the results from estimating the empirical model presented in Equation (5). This specification is used to test Hypothesis 1. In Columns (2) and (3), we present the results of the debt models that include the interactions of the monetary policy and the corresponding country-specific characteristic in the right-hand side, as captured in Equation (7). Specifically, the regression results from the estimation of the model in which

the monetary policy interacts with the dummy variable based on the ratio of bank liquid reserves to bank total assets, which we use to test Hypothesis 2, is presented in Column (2).

Table III.5. Effect of the monetary policy and characteristics of the banking system on the book value of long-term debt

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

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + \beta_1 MAGR_{j,t-1} + \beta_2 MAGR^2_{j,t-1} + \beta_3 GDPGROWTH_{j,t-1} + \beta_F F_{i,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Columns (2) and (3) show the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_H DUMMY\_S_{j,t-1})MAGR_{j,t-1} + (\beta_2 + \gamma_H DUMMY\_S_{j,t-1})MAGR^2_{j,t-1} + \beta_3 GDPGROWTH_{j,t-1} + \beta_F F_{i,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

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 $H_o: \beta_1 + \gamma_1 = 0$; t_2 is the t-statistic for the linear restriction test under the null hypothesis $H_o: \beta_2 + \gamma_2 = 0$; t_3 is the t-statistic for the linear restriction test under the null hypothesis $H_o: \beta_1 + \gamma_3 = 0$; and t_4 is the t-statistic for the linear restriction test under the null hypothesis $H_o: \beta_2 + \gamma_4 = 0$. z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as χ^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 χ^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 χ^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 χ^2 under the null of no correlation between the instruments and the error term, degrees of freedom in parentheses.

	(1)	(2)	(3)
β_1 $MAGR_{j,t-1}$	0.0287 (0.0064)***	0.0913 (0.0148)***	0.0671 (0.0093)***
β_2 $MAGR2_{j,t-1}$	-0.0288 (0.0088)***	-0.1803 (0.0559)***	-0.0743 (0.0112)***
γ_1 BANKLIQ $HI_{j,t-1}MAGR_{j,t-1}$		-0.0550 (0.0152)***	
γ_2 BANKLIQ_$HI_{j,t-1}MAGR2_{j,t-1}$		0.1410 (0.0552)**	
γ_3 PCREDIT_$HI_{j,t-1}MAGR_{j,t-1}$			0.0541 (0.0104)***
γ_4 PCREDIT_$HI_{j,t-1}MAGR2_{j,t-1}$			-0.0940 (0.0294)***
β_3 $GDPGROWTH_{j,t-1}$	-0.0591 (0.0145)***	-0.0118 (0.0221)	-0.0413 (0.0140)***
β_4 $LEV_{i,t-1}$	0.7764 (0.0079)***	0.7618 (0.0098)***	0.7808 (0.0078)***
β_5 $PROFIT_{i,t-1}$	-0.0011 (0.0062)	-0.0109 (0.0072)	0.0028 (0.0060)
β_6 $MTB_{i,t-1}$	0.0013 (0.0006)**	0.0054 (0.0010)***	0.0009 (0.0005)*
β_7 $TAXES_{i,t-1}$	0.0038 (0.0058)	-0.0063 (0.0071)	0.0044 (0.0056)
β_8 $DEPAMTA_{i,t-1}$	0.0164 (0.0243)	-0.0305 (0.0285)	-0.0044 (0.0238)
β_9 $SIZE_{i,t-1}$	0.0046 (0.0006)***	0.0054 (0.0007)***	0.0038 (0.0006)***
β_{10} $TANG_{i,t-1}$	0.0163 (0.0054)***	0.0117 (0.0066)*	0.0144 (0.0052)***
β_{11} $INDLEV_{i,t-1}$	0.0966 (0.0263)***	0.1311 (0.0314)***	0.1055 (0.0261)***
β_{12} $LIQ_{i,t-1}$	-0.0026 (0.0006)***	-0.0035 (0.0007)***	-0.0021 (0.0006)***
β_0 CONSTANT	0.0044 (0.0051)	-0.0095 (0.0061)	0.0026 (0.0051)
IP_{MP}	0.4983	0.2532	0.4515
IP_{BLH}		0.4618	
IP_{PCH}			0.3601
t_1		0.0363 (0.0086)***	
t_2		-0.0392 (0.0150)***	
t_3			0.1212 (0.0189)***
t_4			-0.1683 (0.0356)***
z_1	13776.48 (10)	8931.31 (10)	13823.11 (10)
z_2	334.9 (36)	312.39 (27)	364.38 (36)
z_3	212.11 (14)	103.62 (12)	150.55 (14)
m_1	-37.2	-29.16	-37.04
m_2	1.44	0.87	1.39
Hansen	1304.88 (644)	1045.33 (604)	1452.16 (740)

Column (3) contains the results from estimating the partial adjustment model of debt in which the level of private credit provided by banks is a country-specific factor that moderates the relation between increases in money supply and corporate leverage. We use this specification to test Hypothesis 3.

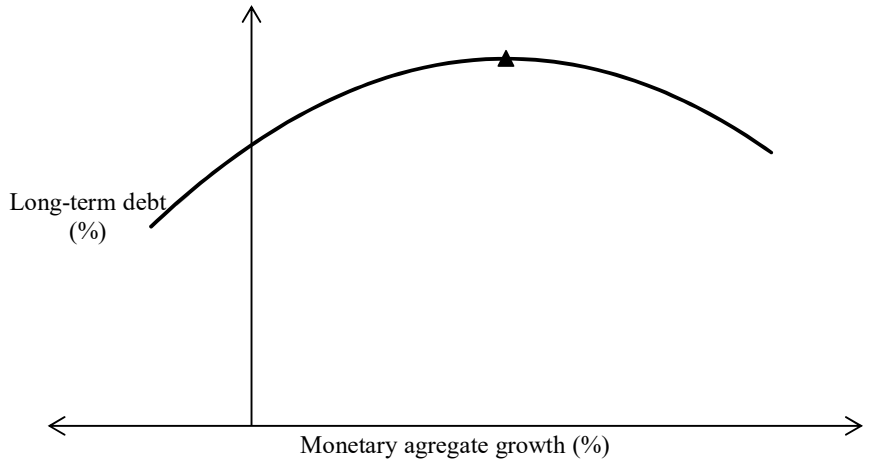
Regarding our first hypothesis, we find support for a nonlinear effect of an expansionary monetary policy and long-term debt, as can be seen in Column (1), since the coefficients of the monetary aggregate growth and its square are positive and negative respectively (the coefficients on $MAGR_{j,t-1}$and $MAGR_{j,t-1}^2$ are positive and negative respectively, both statistically significant, with values of 0.0287 and –0.0288; see $\hat{\beta}_1$ and $\hat{\beta}_2$). As shown in Figure (1), this means that an increase in money supply facilitates corporate leverage provided that the growth in the monetary aggregate does not exceed certain level of liquidity. Beyond the inflection point, managers' risk aversion prevails over the benefits of easy access to funding due to their concern for taking on costlier debt. Note that an excess of liquidity in the economy could lead to higher future inflation, which in turn threatens the profitability of highly leveraged firms with the possibility of an increase in interest rates.

The next step is to derive the level of monetary aggregate growth at which firm long-term debt is maximized. To that aim, we compute the inflection point as: $IP_{MP} = -(\beta_1)/2(\beta_2)$. Beyond this point, an increase in the amount of money compared to the previous year discourages corporate indebtedness. Our results show that increases in the money supply below 49.83% lead to higher firm debt.

With regard to the role of the banking system as a mechanism that affects the efficiency of the monetary policy, we find empirical evidence consistent with our expectations. More

precisely, banks liquidity mitigates the nonlinear effect of monetary policy measures on corporate debt, while this effect is exacerbated in countries in which banks allocate a higher proportion of their resources to the private sector.

Figure III.1. Nonlinear relation between the monetary policy and corporate capital structure
This figure shows the inverted U-shape relation between the monetary policy and long-term debt. The graphic representation is based on the quadratic specification in Equation (5). The derivation of the inflection point is based on this specification. The $IP_{MP} = -(\hat{\beta}_1)/2(\hat{\beta}_2)$ is the inflection point at which the relation between monetary aggregate growth and long-term debt turns from positive to negative.



In relation to the level of bank liquid reserves as a percentage of bank total assets, the results presented in Column (2) are in line with Hypothesis 2. Although the coefficients of the interaction terms mitigate the impact of the monetary policy and its square on debt (the coefficients on $BANKLIQ\_HI_{j,t-1}MAGR_{j,t-1}$ and $BANKLIQ\_HI_{j,t-1}MAGR^2_{j,t-1}$ are negative and positive respectively, both statistically significant, with values of –0.0550 and 0.1410; see $\hat{\gamma}_1$ and $\hat{\gamma}_2$), the coefficient on $MAGR_{j,t-1}$ in countries where banks keep higher liquidity levels is still positive ($\hat{\beta}_1 + \hat{\gamma}_1$ = 0.0913 – 0.0550 = 0.0363 is statistically significant; see t_1) and the coefficient on $MAGR^2_{j,t-1}$ remains negative ($\hat{\beta}_2 + \hat{\gamma}_2$ = –0.1803

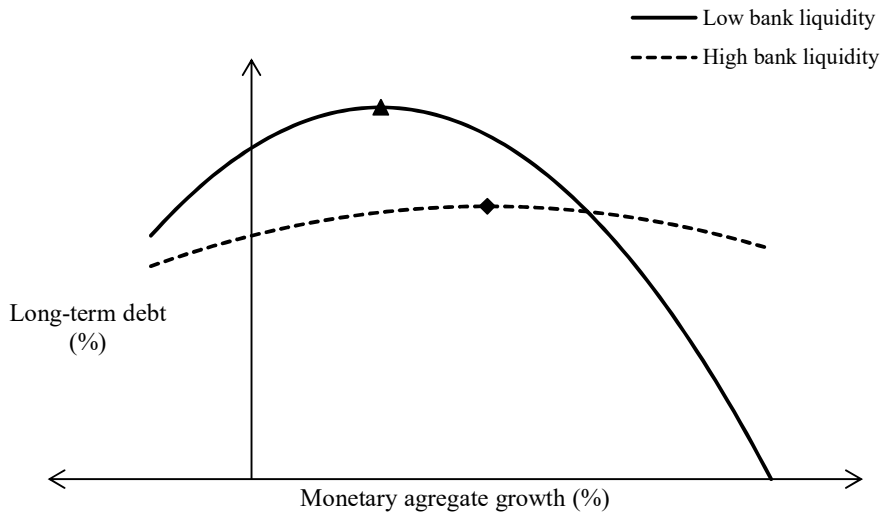
+ 0.1410 = –0.0392 is statistically significant; see t_2). This finding corroborates that, regardless of the level of banks liquid reserves, the monetary policy has a nonlinear effect on corporate leverage, and more precisely the relation exhibits an inverted U-shape.

However, we also need to compute the inflection points at which the relation between the monetary policy and corporate debt turns from positive into negative for both countries in which banks hold higher and lower levels of liquid assets. Consistent with Hypothesis 2, we find that the inflection point in environments where banks liquidity is below the sample median, IP_{MP}, is lower than in countries where banks hold a higher fraction of liquid assets, IP_{BLH}. That is, $IP_{BLH} = 46.18\% > IP_{MP} = 25.32\%$. As Figure (2) highlights, the level of liquidity in the banking system is a country-specific characteristic that mitigates the effect of the monetary policy on firm debt. Note that the slope of the curve is less pronounced in the high liquidity scenario.

Finally, we discuss the results related with how the amount of private credit provided by banks moderates the impact of the monetary policy on firm leverage. As Column (3) shows, the estimated coefficients on the interaction terms that capture the incremental effect of the monetary policy on debt support a more pronounced nonlinear relation in countries where the level of private credit provided by banks is higher (the coefficients on $PCREDIT\_HI_{j,t-1}MAGR_{j,t-1}$ and $PCREDIT\_HI_{j,t-1}MAGR^2_{j,t-1}$ are positive and negative respectively, both statistically significant, with values of 0.0541 and –0.0940; see $\hat{\gamma}_3$ and $\hat{\gamma}_4$). These results are consistent with Hypothesis 3. In particular, we corroborate that the effect of growth in the monetary aggregate on corporate debt is nonlinear and exhibits an inverted U-shape regardless of the amount of banks private credit.

Figure III.2. Nonlinear relation between the monetary policy and corporate capital structure: countries with low vs. high bank liquidity

This figure shows the inverted U-shape relation between the monetary policy and long-term debt in contexts with low banks' liquid reserves in relation to contexts with high banks' liquid reserves. The graphic representation is based on the quadratic specification in Equation (7). The derivation of the inflection points is based on this specification. The $IP_{MP} = -(\hat{\beta}_1)/2(\hat{\beta}_2)$ and $IP_{BL} = -(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$ are the inflection points at which the relation between monetary aggregate growth and long-term debt turns from positive to negative in the two contexts considered.



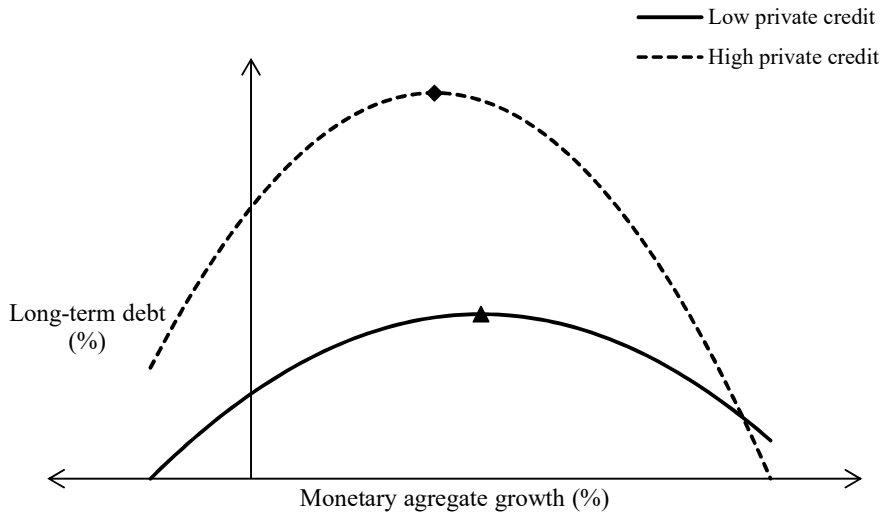
Furthermore, supporting our expectations as regards the influence of the monetary policy on firm debt and the moderating role of banks private credit, the inflection points reveal that in countries with higher private credit the level of growth in the monetary aggregate that maximizes corporate leverage is reached earlier. That is, $IP_{PCH} = 36.01\% < IP_{MP} = 45.15\%$. Consequently, in line with Hypothesis 3 and as Figure (3) shows, the amount of private credit provided by banks is a country-specific characteristic that exacerbates the effect of the monetary policy on firms' debt. It is worthwhile noting that the slope of the curve is more pronounced in countries where the fraction of private credit provided by banks is higher.

With respect to the remaining determinants of debt, we find patterns of pecking order behavior in the sense that a significant negative relation exists between the annual growth in nominal GDP and debt. The rationale for this interpretation is that economic growth

generally facilitates an increase in internally generated funds, which are a preferred source of financing over external funds due to asymmetric information problems (the coefficients on $GDPGROWTH_{j,t-1}$ are negative and statistically significant with values of –0.0591, –0.0118 and –0.0413 in Columns (1), (2) and (3), respectively; see $\hat{\beta}_3$).

Figure III.3. Nonlinear relation between the monetary policy and corporate capital structure: countries with low vs. high private credit provided by banks

This figure shows the inverted U-shape relation between the monetary policy and long-term debt in countries with low private credit in relation to countries with high private credit provided by banks. The graphic representation is based on the quadratic specification in Equation (7). The derivation of the inflection points is based on this specification. The $IP_{MP} = -(\hat{\beta}_1)/2(\hat{\beta}_2)$ and $IP_{PC} = -(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$ are the inflection points at which the relation between monetary aggregate growth and long-term debt turns from positive to negative in the two types of countries considered.



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 0.0013, 0.0054 and 0.0009 in Columns (1), (2) and (3), respectively; see $\hat{\beta}_6$). These results show that firms with higher growth potential look for additional external financing, such as debt financing.

Regarding the size of the company, we find that it affects leverage positively (the coefficients on $SIZE_{i,t-1}$ are positive and statistically significant with values of 0.0046,

0.0054 and 0.0038 in Columns (1), (2) and (3), respectively; see $\hat{\beta}_9$), which is consistent with the vast majority of previous studies. Furthermore, consistent with the idea that fixed assets are frequently used as collateral, we find a positive effect of tangibility on debt (the coefficients on $TANG_{i,t-1}$ are positive and statistically significant with values of 0.0163, 0.0117 and 0.0144 in Columns (1), (2) and (3), respectively; see $\hat{\beta}_{10}$).

As expected, 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 0.0966, 0.1311 and 0.1055 in Columns (1), (2) and (3), respectively; see $\hat{\beta}_{11}$), supporting the idea that industry leverage is often used as proxy for target debt. 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 –0.0026, –0.0035 and –0.0021 in Columns (1), (2) and (3), 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, in all three specifications we find no significant effects for profitability, tax shields due to interests deductibility and the need for interest deductions provided by debt financing (the coefficients on $PROFIT_{i,t-1}$, $TAXES_{i,t-1}$ and $DEPAMTA_{i,t-1}$ in Columns (1), (2) and (3) are statistically non-significant; see $\hat{\beta}_5$, $\hat{\beta}_7$ and $\hat{\beta}_8$).

III.5. Robustness checks

In this section, we test whether our results are robust to the use of the market value of long-term debt, instead of the book value of long-term debt, in Equation (1) and as dependent variable in our empirical specifications. Table 6 presents the results of our additional

regression analyses. In each column of this table, we present the coefficients from the estimation of a model that enables us to test each one of our hypotheses.

Table III.6. Robustness test. Effect of the monetary policy and characteristics of the banking system on the market value of long-term debt

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

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + \beta_1 MAGR_{j,t-1} + \beta_2 MAGR^2_{j,t-1} + \beta_3 GDPGROWTH_{j,t-1} + \beta_F F_{i,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

Columns (2) and (3) show the generalized method of moments regression results from:

$$LEV_{it} = \beta_0 + (1-\lambda)LEV_{i,t-1} + (\beta_1 + \gamma_H DUMMY\_S_{j,t-1})MAGR_{j,t-1} + (\beta_2 + \gamma_H DUMMY\_S_{j,t-1})MAGR^2_{j,t-1} + \beta_3 GDPGROWTH_{j,t-1} + \beta_F F_{i,t-1} + \beta_N N_j + \beta_T T_t + \lambda\eta_i + \upsilon_{it}.$$

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 $H_o: \beta_1 + \gamma_1 = 0$; t_2 is the t-statistic for the linear restriction test under the null hypothesis $H_o: \beta_2 + \gamma_2 = 0$; t_3 is the t-statistic for the linear restriction test under the null hypothesis $H_o: \beta_1 + \gamma_3 = 0$; and t_4 is the t-statistic for the linear restriction test under the null hypothesis $H_o: \beta_2 + \gamma_4 = 0$. z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as χ^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 χ^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 χ^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 χ^2 under the null of no correlation between the instruments and the error term, degrees of freedom in parentheses.

	(1)	(2)	(3)
β_1 $MAGR_{j,t-1}$	0.0454 (0.0062)***	0.0808 (0.0139)***	0.0908 (0.0089)***
β_2 $MAGR2_{j,t-1}$	-0.0414 (0.0090)***	-0.1412 (0.0556)**	-0.1024 (0.0112)***
γ_1 BANKLIQ $HI_{j,t-1}MAGR_{j,t-1}$		-0.0473 (0.0141)***	
γ_2 BANKLIQ_$HI_{j,t-1}MAGR2_{j,t-1}$		0.1167 (0.0545)**	
γ_3 PCREDIT_$HI_{j,t-1}MAGR_{j,t-1}$			0.0730 (0.0098)***
γ_4 PCREDIT_$HI_{j,t-1}MAGR2_{j,t-1}$			-0.2156 (0.0269)***
β_3 $GDPGROWTH_{j,t-1}$	-0.1579 (0.0131)***	-0.0140 (0.0198)	-0.1583 (0.0130)***
β_4 $LEV_{i,t-1}$	0.7340 (0.0075)***	0.7167 (0.0090)***	0.7404 (0.0073)***
β_5 $PROFIT_{i,t-1}$	-0.0115 (0.0052)**	-0.0125 (0.0061)**	-0.0084 (0.0050)*
β_6 $MTB_{i,t-1}$	0.0017 (0.0005)***	0.0046 (0.0008)***	0.0015 (0.0005)***
β_7 $TAXES_{i,t-1}$	0.0017 (0.0055)	-0.0131 (0.0065)**	0.0022 (0.0052)
β_8 $DEPAMTA_{i,t-1}$	-0.0734 (0.0216)***	-0.0797 (0.0254)***	-0.057 (0.0208)***
β_9 $SIZE_{i,t-1}$	0.0052 (0.0005)***	0.0067 (0.0006)***	0.0041 (0.0005)***
β_{10} $TANG_{i,t-1}$	0.0097 (0.0050)*	0.0001 (0.0062)	0.0067 (0.0048)
β_{11} $INDLEV_{i,t-1}$	0.1121 (0.0193)***	0.1296 (0.0230)***	0.0963 (0.0190)***
β_{12} $LIQ_{i,t-1}$	-0.0026 (0.0005)***	-0.0034 (0.0006)***	-0.0018 (0.0005)***
β_0 CONSTANT	0.0007 (0.0041)	-0.0118 (0.0049)**	0.0009 (0.0040)
IP_{MP}	0.5483	0.2861	0.4434
IP_{BLH}		0.6837	
IP_{PCH}			0.2575
t_1		0.0335 (0.0083)***	
t_2		-0.0245 (0.0143)*	
t_3			0.1639 (0.0178)***
t_4			-0.3180 (0.0335)***
z_1	17104.72 (10)	18169.62 (10)	17290.97 (10)
z_2	420.01 (36)	204.23 (27)	317.95 (36)
z_3	1455.24 (14)	901.28 (12)	1302.86 (14)
m_1	-37.6	-29.22	-38.07
m_2	1.54	-1.15	1.41
Hansen	2139.42 (644)	1484.78 (604)	2262.62 (740)

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 long-term debt is used as dependent variable.

In particular, we confirm that the effect of the monetary aggregate growth on debt is nonlinear and that the relation between both variables exhibits an inverted U-shape. These findings continue to support that an increase in the money supply encourages firms to finance themselves using long-term debt as long as the growth in liquidity does not exceed the optimal level. The estimated coefficients presented in Column (1) offer further support for Hypothesis 1.

The robustness tests also corroborate Hypotheses 2 and 3, which focus on the moderating effects of the banking system in the relation between firm leverage and monetary policy measures. Specifically, the estimated coefficients presented in Column (2) are consistent with Hypothesis 2 and highlight that the effect of the monetary policy is mitigated in countries where bank liquid reserves are higher. In addition, the results confirm that effect of the monetary policy on debt is still nonlinear in this type of country.

The inflection points at which the monetary policy starts to affect firm debt negatively also reveal that the level of money supply that maximizes corporate leverage is higher in countries where banks have at their disposal more liquid reserves. Thus, our empirical evidence is robust to the use of the market value of long-term debt as dependent variable in the model.

Finally, as can be seen in Column (3), we find that in countries where banks allocate a higher proportion of their funds to the private sector, the effect of the monetary policy on corporate debt follows a more pronounced inverted U-shape even when we use the market

value of leverage. In this case, in line with our main regression analyses, the inflection points show that the optimal level in the growth of the monetary aggregate is lower when banks private credit is higher.

III.6. Conclusions

This study provides new insight on the capital structure of companies in response to recent findings that highlight the need to pay more attention to macroeconomic and institutional variables. Specifically, our empirical evidence shows the importance of the monetary policy when investigating corporate debt in an international context.

The monetary policy and corporate leverage are nonlinearly related. In particular, the relation between both variables exhibits an inverted U-shape. Initially, an increase in the money supply facilitates firms' borrowing due to higher levels of liquidity in the markets. However, when the growth in the monetary aggregate exceeds the optimal level, further increases in the money supply have a negative effect on corporate leverage. A likely explanation for the negative impact is that in this latter scenario debt eventually becomes costlier as a consequence of a possible interest rate rise due to inflationary pressures. The risk of holding more expensive debt discourages firm indebtedness and leads companies to prefer internal funds over debt.

Additionally, the characteristics of the banking system influence the intensity of the effect of monetary policy measures on corporate debt. Specifically, the amount of banks liquid reserves is a factor that alleviates the effect of the monetary policy on debt. Therefore, monetary policy measures seem more effective in countries where banks have fewer liquid assets. By contrast, in environments where banks have more liquid reserves, a more

aggressive expansionary monetary policy will be needed to help firms achieve their maximum level of indebtedness.

The allocation of banks loan portfolio also shapes the effect of monetary policy measures. More precisely, in countries where banks provide a higher proportion of private credit, the effect of the monetary policy on debt is more pronounced. In light of this result, we can conclude that the monetary policy is more effective when banks lend more funds to the private sector and, as a consequence, the optimal level at which corporate leverage is maximized is reached for lower levels of monetary aggregate growth in this context.

Taking into account that the monetary policy is the main tool that central banks have at their disposal to stabilize the economy, our findings have important implications for policy-makers. First, our empirical evidence shows that increases in money supply should not be used indiscriminately because it only facilitates firms' access to debt financing up to a level. From that level onwards, further growth in the monetary aggregate could have unintended consequences, such as discouraging firms from using debt as a source of financing.

Second, monetary authorities should consider the characteristics of the banking system when designing the monetary policy. There are other factors that could influence the effectiveness of monetary policy measures in addition to the independence and the communication strategy of central banks, as well as the consistency of the monetary policy. Two such factors are the proportion of liquid assets that banks hold and the amount of private credit provided by banks. On the one hand, policymakers should note that, if banks in their country have high levels of liquidity, the effect of an expansionary monetary policy may be lower than expected. On the other hand, if banks lend a higher fraction of their resources to

the private sector, monetary authorities must be very careful when promoting an increase in the money supply because the monetary policy starts to affect firm debt negatively for lower growth levels in the monetary aggregate.

Chapter **IV**

Diversification strategies, family ownership and debt policy

IV.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, they include 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 related with the fact that diversification and leverage decisions can influence each other and can be made simultaneously (Doukas & Kan, 2006; Low & Chen, 2004), which creates problems to establish causality.

In this regard, O'Brien, David, Yoshikawa & Delios (2014) investigate how debt influences firm diversification strategies. The perspective adopted by these authors 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) diversified cash flows 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 weak 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 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 for small- and medium-sized firms (SMEs) in the United Kingdom presented by Jordan, Lowe & Taylor (1998). 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 unrelated diversification and related diversification on firm debt financing levels are non-significant in firms located 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 costs of debt because of lower distress likelihood.

It is worth noting that, from all previous 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 mitigate the risk of obtaining biased results.

Among the first empirical works that examine the effect of product diversification on corporate leverage in an international context is the one by Low & Chen (2014). Despite their reduced sample in terms of the number of firms, they extend previous research to 34 countries. They 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 effect 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 reaching biased conclusions, we use the panel data

methodology in the estimation process because it allows us to control for the effect of unobservable 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, define firm strategic decisions, including whether to diversify or not, as well as firm financial decisions, such as the amount of corporate leverage. 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 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 minimize the risk of obtaining biased results (La Rocca, La Rocca, Gerace & Smark, 2009). Our empirical approach represents an important step forward because previous studies 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 previous related studies, most of which are 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 advance previous related research that either do not consider this dimension (Barton & Gordon, 1988; Jordan, Lowe & Taylor, 1998; Kochhar & Hitt, 1998; Menéndez-Alonso, 2003; Ngah-Kiing Lim, Das & Das, 2009), or just consider it marginally by 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 unobservable heterogeneity, which is a problem that affects most managerial and finance models (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 unobservable 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. The individual effect is then removed in the estimation process, thus helping us to mitigate the risk of obtaining biased results.

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 results and the robustness tests, respectively. Section 6 summarizes the main results and concludes.

IV.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 study from three different theoretical perspectives: the coinsurance effect, the transaction cost theory and 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 firm operates (Lewellen, 1971; Kim & McConnell 1977). Such beneficial effect is even stronger in firms that prefer 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 lower liquidation value in case of default) using debt, while equity is the preferred financing type to buy specific assets (characterized by higher 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 firms can obtain higher levels of debt. As a result, an unrelated diversification strategy facilitates firm access to debt markets. In addition, internal capital markets also facilitate firms' access to debt because non-specific resources can be used in the different sectors in which the firm operates, making it easier for 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 adopt diversification strategies primarily motivated by their own personal interests (i.e., unrelated diversification) thus benefitting shareholder (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 managers in general tend to withhold free cash flows and diversification offers new overinvestment opportunities for these resources. Consequently, lower levels of debt could increase overinvestment problems (Li & Li, 1996) and, as a result, diversified firms need debt to maximize their value (Kaplan & Weisbach, 1992; Li & Li, 1996; Singh, Davidson & Suchard, 2003). It should also be

noted that diversification increases 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 the type 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 them has its own agency problems that lead to different preferences when it comes to diversification strategies (Gómez-Mejía, Makri, & Kintana, 2010) and debt policies.

IV.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, & Kintana, 2010). The main reason to explain 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, a sense of belonging, affection, and intimacy, as well as an active role in 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, & 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 that is necessary 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 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).

IV.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 reduce the risk of getting biased results. In fact, 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).

IV.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). Nevertheless, the expected positive effect could be lower 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).

However, for this expected positive effect of related diversification on debt to hold, firms need strong corporate governance mechanisms that facilitate monitoring and reduce the risk of overinvestment in the diversification process, which would lead to a poor firm 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 strategy 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 related. Note that related diversification is based on a higher degree of 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 family firms overall 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 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 find that product diversification and firm debt could be non-linearly related. Therefore, 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.

IV.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 firms 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 the internal capital market. 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 firm 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 contend 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 higher optimal level of unrelated diversification in family than in non-family firms.

IV.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 robust 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 owner 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 new dimensions considered are the nature of the second largest shareholder and the presence of a manager shareholder with managerial responsibilities and a stake in the business.

IV.2.3.1. The nature of the second largest shareholder

While it is true that agency problems caused by 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).

IV.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 sing 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 encourage 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 company type. 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 and reveals family's intentions not to default on debt commitments. Creditors may interpret this as a sign of trust between the two parties (Pindado, Requejo, & de la Torre, 2015).

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

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).

IV.3. Data, variables, and estimation method

IV.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 and historical inflation rates of each country are obtained from the website of the World Bank. Table 1 presents variable definitions and data sources used to calculate them.

Table IV.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	World Bank
GDPGROWTH	Annual growth of nominal GDP	World Bank

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.

Table IV.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

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-digits 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. The distribution of the sample by country is presented in Table 3.

Table IV.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	

IV.3.2. Model 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*; λ is the speed of adjustment of leverage to the firm's desired level; and ε_{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 unobservable heterogeneity, which can be assumed constant over time, with the individual effect, η_i. Finally, υ_{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 λ 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 (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, & 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 characteristics, 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 detail the set of firm-specific variables related with diversification 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 $C_{j,t-1}$) included in the specifications proposed to test our hypotheses, 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.

Table IV.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

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 $DUMFAM_i RELDIV^2_{i,t-1}$. Now, two cases should be considered. First, for non-family firms, the effect of related diversification on debt is captured by β_1 and β_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 β_1 and β_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 $-(\hat{\beta}_1)/2(\hat{\beta}_2)$[8] < $-(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$[9] to support that the optimal level of unrelated

[8] 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 is: $DIV_{i,t-1} = -\hat{\beta}_1/2\hat{\beta}_2$.

[9] 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

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 $DUMBANK_i RELDIV^2_{i,t-1}$ ($DUMBANK_i UNRELDIV_{i,t-1}$ 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 β_1 and β_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).

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 is: $DIV_{i,t-1} = -(\hat{\beta}_1 + \hat{\gamma}_H)/2(\hat{\beta}_2 + \hat{\gamma}_H)$.

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 β_1 and β_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.

IV.3.3. Estimation method

Given that unobservable 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 unobservable 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 unobservable heterogeneity is the alleviation of the omitted variable bias (Chi, 2005; Mura, 2007).

In addition to the unobservable 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 model complies with the stationarity assumption since the correlation between the explanatory variables and the unobservable 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 $t-1$ to $t-4$ for all the right-hand side variables as instruments for the equations in differences (except for the lagged variable, $LEV_{i,t-1}$, which is assigned lags from $t-2$ to $t-5$) 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 the joint significance of the reported coefficients, as well as of the country and time dummies.

IV.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

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

Column (1) highlights 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 χ^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 χ^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 χ^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 χ^2 under the null of no correlation between the instruments and the error term, degrees of freedom in parentheses.

	(1)	(2)
β_1 $RELDIV_{i,t-1}$	-0.0075 (0.0037)**	
β_2 $RELDIV^2_{i,t-1}$	0.0043 (0.0026)	
γ_1 $DUMFAM_i$ $RELDIV_{i,t-1}$	0.0292 (0.0059)***	
γ_2 $DUMFAM_i$ $RELDIV^2_{i,t-1}$	-0.0250 (0.0040)***	
β_1 $UNRELDIV_{j,t-1}$		0.0079 (0.0044)*
β_2 $UNRELDIV^2_{j,t-1}$		-0.0106 (0.0037)***
γ_3 $DUMFAM_i$ $UNRELDIV_{i,t-1}$		0.0144 (0.0062)**
γ_4 $DUMFAM_i$ $UNRELDIV^2_{i,t-1}$		-0.0082 (0.0049)*
β_3 $DUMFAM_i$	-0.0037 (0.0024)	0.0011 (0.0023)
β_4 $LEV_{i,t-1}$	0.6979 (0.0044)***	0.6989 (0.0044)***
β_5 $PROFIT_{i,t-1}$	-0.0289 (0.0032)***	-0.0280 (0.0032)***
β_6 $MTB_{i,t-1}$	0.0027 (0.0005)***	0.0020 (0.0005)***
β_7 $TAXES_{i,t-1}$	0.0084 (0.0017)***	0.0093 (0.0015)***
β_8 $DEPAMTA_{i,t-1}$	-0.0712 (0.0126)***	-0.0725 (0.0121)***
β_9 $SIZE_{i,t-1}$	0.0066 (0.0005)***	0.0059 (0.0005)***
β_{10} $TANG_{i,t-1}$	0.0175 (0.0040)***	0.0194 (0.0040)***
β_{11} $INDLEV_{i,t-1}$	0,0480 (0,0144)***	0,0233 (0,0142)
β_{12} $LIQ_{i,t-1}$	-0.0061 (0.0004)***	-0.0053 (0.0004)***
β_{13} $AT_{i,t-1}$	-0.0073 (0.0011)***	-0.0076 (0.0011)***
β_{14} $INFLATION_{j,t-1}$	-0,0238 (0,0047)***	-0,0240 (0,0045)***
β_{15} $GDPGROWTH_{j,t-1}$	-0,0572 (0,0160)***	-0,0763 (0,0162)***
β_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)

interacts with the above-mentioned dummy. We use this specification to test Hypothesis 3b.

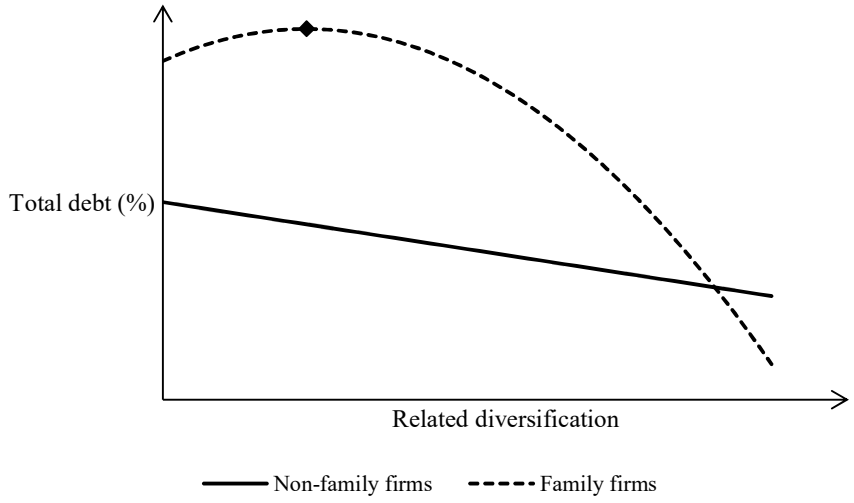
Finally, in Columns (1) and (2) of Table 7, we present the results of the debt models in which the respective diversification measure (related and unrelated) is interacted with the dummy variable that equals one when the controlling family also occupies a management position. As with the empirical models 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, provided that the growth in related diversification does not exceed certain optimal level. Beyond the inflection point, IP_{FF}, more diversification discourages the use of debt.

Figure IV.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.



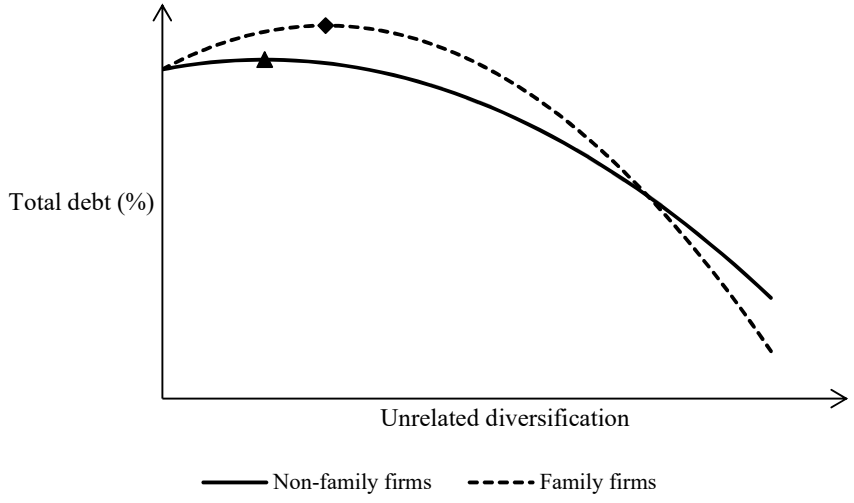
With respect to the unrelated diversification strategy in family and non-family firms, the results presented in Column (2) of Table 5 are in line with Hypothesis 2. Specifically, our results support the idea that increasing the degree of unrelated diversification has a non-linear effect on corporate 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.

Figure IV.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 $IP_{FF} = -(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.



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

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

Column (1) highlights 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)
β_1 $RELDIV_{i,t-1}$	0,0121 (0,0027)***	
β_2 $RELDIV^2_{i,t-1}$	-0,0116 (0,0019)***	
γ_5 $DUMBANK_i$ $RELDIV_{i,t-1}$	0,0236 (0,0041)***	
γ_6 $DUMBANK_i$ $RELDIV^2_{i,t-1}$	-0,0223 (0,0031)***	
β_1 $UNRELDIV_{i,t-1}$		0,0127 (0,0021)***
β_2 $UNRELDIV^2_{i,t-1}$		-0,0081 (0,0018)***
γ_7 $DUMBANK_i$ $UNRELDIV_{i,t-1}$		0,0301 (0,0031)***
γ_8 $DUMBANK_i$ $UNRELDIV^2_{i,t-1}$		-0,0029 (0,0002)***
β_3 $DUMBANK_i$	0,0015 (0,0007)**	-0,0010 (0,0007)
β_4 $LEV_{i,t-1}$	0,7375 (0,0058)***	0,7263 (0,0040)***
β_5 $PROFIT_{i,t-1}$	-0,0046 (0,0037)	-0,0065 (0,0038)*
β_6 $MTB_{i,t-1}$	0,0047 (0,0004)***	0,0046 (0,0003)***
β_7 $TAXES_{i,t-1}$	-0,0009 (0,0011)	-0,0009 (0,0010)
β_8 $DEPAMTA_{i,t-1}$	-0,0566 (0,0101)***	-0,0520 (0,0142)***
β_9 $SIZE_{i,t-1}$	0,0042 (0,0004)***	0,0040 (0,0003)***
β_{10} $TANG_{i,t-1}$	0,0052 (0,0031)*	0,0114 (0,0028)***
β_{11} $INDLEV_{i,t-1}$	0,0815 (0,0155)***	0,0956 (0,0138)***
β_{12} $LIQ_{i,t-1}$	-0,0075 (0,0003)***	-0,0077 (0,0003)***
β_{13} $AT_{i,t-1}$	-0,0069 (0,0007)***	-0,0081 (0,0007)***
β_{14} $INFLATION_{j,t-1}$	-0,0288 (0,0135)**	-0,0312 (0,0118)***
β_{15} $GDPGROWTH_{j,t-1}$	-0,3311 (0,0201)***	-0,3318 (0,0206)***
β_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)

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

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 $DUMBANK_i RELDIV^2_{i,t-1}$ 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.

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 $DUMBANK_i UNRELDIV^2_{i,t-1}$ 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.

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.

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 $RELDI\ _{i,t-1}^{2}$ 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 a non–significant value, respectively; see $\hat{\gamma}_9$ and $\hat{\gamma}_{10}$).

Figure IV.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 $IP_{FSS} = -(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.

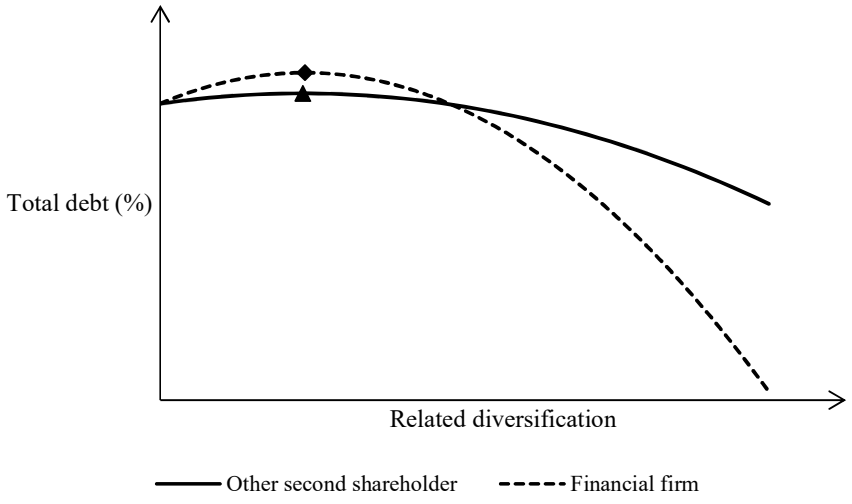


Figure IV.3b. Relation between unrelated diversification and corporate capital structure accounting for family firm heterogeneity: Nature of the second largest shareholder

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 $IP_{FSS} = -(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.

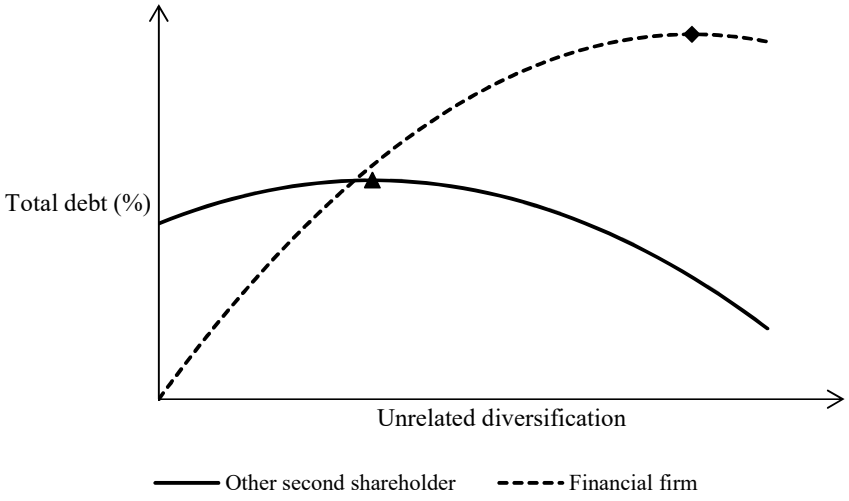


Table IV.7. Effect of the diversification strategy on the book value of debt among family firms: Moderating role of the presence of family owners in the management team

Column (1) highlights 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)
β_1 $RELDIV_{i,t-1}$	0,0133 (0,0037)***	
β_2 $RELDIV^2_{i,t-1}$	-0,0181 (0,0023)***	
γ_9 $DUMSHMAN_i$ $RELDIV_{i,t-1}$	0,0158 (0,0048)***	
γ_{10} $DUMSHMAN_i$ $RELDIV^2_{i,t-1}$	0,002 0(0,0031)	
β_1 $UNRELDIV_{i,t-1}$		0,0198 (0,0033)***
β_2 $UNRELDIV^2_{i,t-1}$		-0,0113 (0,0027)***
γ_{11} $DUMSHMAN_i$ $UNRELDIV_{i,t-1}$		0,0738 (0,0050)***
γ_{12} $DUMSHMAN_i$ $UNRELDIV^2_{i,t-1}$		-0,0410 (0,0041)***
β_3 $DUMSHMAN_i$	0,0096 (0,0019)***	0,0164 (0,0015)***
β_4 $LEV_{i,t-1}$	0,7236 (0,0047)***	0,7148 (0,0037)***
β_5 $PROFIT_{i,t-1}$	-0,0013 (0,0033)	-0,0010 (0,0033)
β_6 $MTB_{i,t-1}$	0,0044 (0,0003)***	0,0043 (0,0003)***
β_7 $TAXES_{i,t-1}$	-0,0008 (0,0011)	0,0004 (0,0012)
β_8 $DEPAMTA_{i,t-1}$	-0,0544 (0,0100)***	-0,0569 (0,0101)***
β_9 $SIZE_{i,t-1}$	0,0046 (0,0003)***	0,0047 (0,0004)***
β_{10} $TANG_{i,t-1}$	0,0082 (0,0036)**	0,0058 (0,0032)*
β_{11} $INDLEV_{i,t-1}$	0,0415 (0,0124)***	-0,0013 (0,0145)
β_{12} $LIQ_{i,t-1}$	-0,0077 (0,0002)***	-0,0074 (0,0002)***
β_{13} $AT_{i,t-1}$	-0,0053 (0,0008)***	-0,0049 (0,0007)***
β_{14} $INFLATION_{j,t-1}$	-0,0422 (0,0158)***	-0,0503 (0,0169)***
β_{15} $GDPGROWTH_{j,t-1}$	-0,3109 (0,0235)***	-0,3455 (0,0171)***
β_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)

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.

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 $DUMSHMAN_i UNRELDIV^2_{i,t-1}$ 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.

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 (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) in 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

Figure IV.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 $IP_{SM} = -(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.

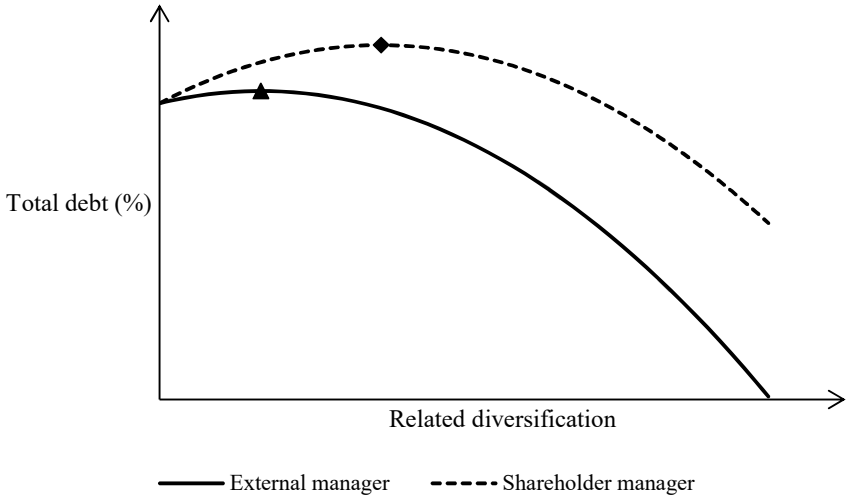
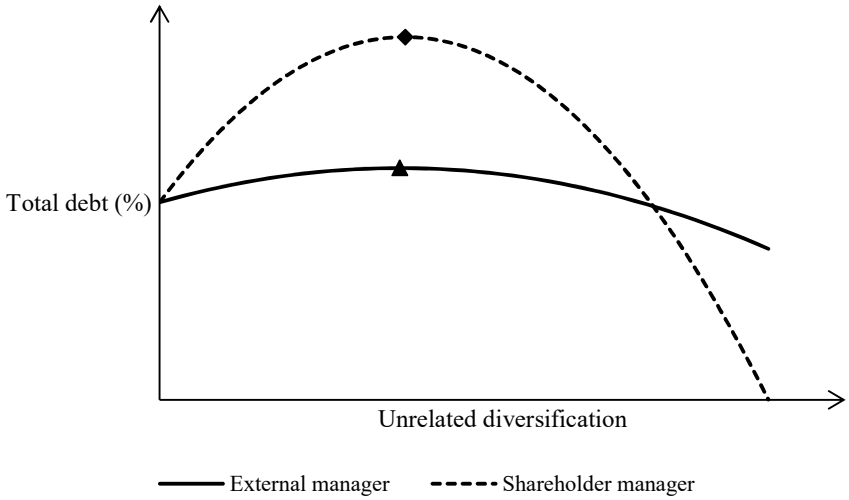


Figure IV.4b. Relation between unrelated diversification and corporate capital structure accounting for family firm heterogeneity: external versus family manager

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 $IP_{SM} = -(\hat{\beta}_1 + \hat{\gamma}_1)/2(\hat{\beta}_2 + \hat{\gamma}_2)$ are the inflection points at which the relation between diversification and debt turns from positive to negative in each type of company.



analysis (the coefficients on $DUMSHMAN_i$ are positive and statistically significant with values of 0.0096 and 0.0164 in Columns (1) and (2) in 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 –0.0046 in Columns (1), and (2) of Table 5, and in Column (1) 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 minimize 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, 0.114, 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 utilization of corporate assets (Singh, Davidson, & Suchard, 2003; Pindado, Requejo, & de la Torre, 2015) because that this is an inverse measure of agency costs (Ang, Cole, & Lin, 2000), a negative effect suggests that more efficient firms rely on corporate debt to a lesser extent.

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 $\hat{\beta}_{15}$).

IV.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.

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

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

Column (1) highlights 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)
β_1 $RELDIV_{i,t-1}$	-0.0061 (0.0031)**	
β_2 $RELDIV^2_{i,t-1}$	0.0016 (0.0023)	
γ_1 $DUMFAM_i$ $RELDIV_{i,t-1}$	0.0363 (0.0055)***	
γ_2 $DUMFAM_i$ $RELDIV^2_{i,t-1}$	-0.0214 (0.0038)***	
β_1 $UNRELDIV_{j,t-1}$		0.0083 (0.0036)**
β_2 $UNRELDIV^2_{j,t-1}$		-0.0114 (0.0030)***
γ_3 $DUMFAM_i$ $UNRELDIV_{i,t-1}$		0.0247 (0.0053)***
γ_4 $DUMFAM_i$ $UNRELDIV^2_{i,t-1}$		-0.0093 (0.0042)**
β_3 $DUMFAM_i$	0.0050 (0.0021)**	0.0003 (0.0021)
β_4 $LEV_{i,t-1}$	0.6637 (0.0045)***	0.6638 (0.0043)***
β_5 $PROFIT_{i,t-1}$	-0.0237 (0.0031)***	-0.0230 (0.0030)***
β_6 $MTB_{i,t-1}$	-0.0021 (0.0004)***	-0.0021 (0.0004)***
β_7 $TAXES_{i,t-1}$	0.0081 (0.0014)***	0.0090 (0.0014)***
β_8 $DEPAMTA_{i,t-1}$	-0.0719 (0.0122)***	-0.0749 (0.0120)***
β_9 $SIZE_{i,t-1}$	0.0060 (0.0004)***	0.0053 (0.0004)***
β_{10} $TANG_{i,t-1}$	0.0217 (0.0036)***	0.0245 (0.0035)***
β_{11} $INDLEV_{i,t-1}$	-0.0329 (0.0121)***	-0.0310 (0.0119)***
β_{12} $LIQ_{i,t-1}$	-0.0062 (0.0003)***	-0.0059 (0.0003)***
β_{13} $AT_{i,t-1}$	-0.0086 (0.0010)***	-0.0091 (0.0010)***
β_{14} $INFLATION_{j,t-1}$	0.0437 (0.0040)***	0.0443 (0.0038)***
β_{15} $GDPGROWTH_{j,t-1}$	0.0431 (0.0139)***	0.0621 (0.0137)***
β_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 IV.9. Effect of the diversification strategy on the market value of debt among family firms: Moderating role of the second largest shareholder

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

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

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)
β_1 $RELDIV_{i,t-1}$	0,0205 (0,0034)***	
β_2 $RELDIV^2_{i,t-1}$	-0,0205 (0,0024)***	
γ_5 $DUMBANK_i$ $RELDIV_{i,t-1}$	0,0284 (0,0049)***	
γ_6 $DUMBANK_i$ $RELDIV^2_{i,t-1}$	-0,0194 (0,0035)***	
β_1 $UNRELDIV_{i,t-1}$		0,0207 (0,0028)***
β_2 $UNRELDIV^2_{i,t-1}$		-0,0147 (0,0021)***
γ_7 $DUMBANK_i$ $UNRELDIV_{i,t-1}$		0,0294 (0,0033)***
γ_8 $DUMBANK_i$ $UNRELDIV^2_{i,t-1}$		-0,0025 (0,0003)***
β_3 $DUMBANK_i$	0,0066 (0,001)***	0,004 (0,0005)***
β_4 $LEV_{i,t-1}$	0,7188 (0,0057)***	0,6969 (0,0052)***
β_5 $PROFIT_{i,t-1}$	-0,0064 (0,0044)	-0,0137 (0,0028)***
β_6 $MTB_{i,t-1}$	0,0183 (0,0005)***	0,0009 (0,0003)***
β_7 $TAXES_{i,t-1}$	-0,0022 (0,0013)*	0,0005 (0,0011)
β_8 $DEPAMTA_{i,t-1}$	-0,032 (0,0126)**	-0,107 (0,0135)***
β_9 $SIZE_{i,t-1}$	0,008 (0,0004)***	0,0029 (0,0003)***
β_{10} $TANG_{i,t-1}$	-0,0021 (0,0031)	0,0139 (0,0028)***
β_{11} $INDLEV_{i,t-1}$	0,0141 (0,0144)	0,0712 (0,014)***
β_{12} $LIQ_{i,t-1}$	-0,0071 (0,0003)***	-0,0069 (0,0003)***
β_{13} $AT_{i,t-1}$	-0,0082 (0,0008)***	-0,0101 (0,0006)***
β_{14} $INFLATION_{j,t-1}$	-0,0831 (0,0167)***	-0,0347 (0,0132)***
β_{15} $GDPGROWTH_{j,t-1}$	0,3692 (0,0229)***	0,2553 (0,0229)***
β_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 IV.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) highlights 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)
β_1 $RELDIV_{i,t-1}$	0,0106 (0,0038)***	
β_2 $RELDIV^2_{i,t-1}$	-0,0127 (0,0022)***	
γ_9 $DUMSHMAN_i$ $RELDIV_{i,t-1}$	0,0270 (0,0057)***	
γ_{10} $DUMSHMAN_i$ $RELDIV^2_{i,t-1}$	-0,0093 (0,0037)**	
β_1 $UNRELDIV_{i,t-1}$		0,0160 (0,0039)***
β_2 $UNRELDIV^2_{i,t-1}$		-0,0059 (0,0030)*
γ_{11} $DUMSHMAN_i$ $UNRELDIV_{i,t-1}$		0,0675 (0,0047)***
γ_{12} $DUMSHMAN_i$ $UNRELDIV^2_{i,t-1}$		-0,0385 (0,0039)***
β_3 $DUMSHMAN_i$	0,0049 (0,0020)**	0,0145 (0,0017)***
β_4 $LEV_{i,t-1}$	0,5870 (0,0050)***	0,7149 (0,0041)***
β_5 $PROFIT_{i,t-1}$	-0,0140 (0,0032)***	-0,0054 (0,0031)*
β_6 $MTB_{i,t-1}$	-0,0136 (0,0003)***	0,0040 (0,0003)***
β_7 $TAXES_{i,t-1}$	-0,0007 (0,0012)	-0,0001 (0,0011)
β_8 $DEPAMTA_{i,t-1}$	-0,1084 (0,0125)***	-0,0633 (0,0087)***
β_9 $SIZE_{i,t-1}$	0,0047 (0,0004)***	0,0055 (0,0004)***
β_{10} $TANG_{i,t-1}$	0,0325 (0,0038)***	0,0035 (0,0033)
β_{11} $INDLEV_{i,t-1}$	0,0852 (0,0156)***	0,0026 (0,0163)
β_{12} $LIQ_{i,t-1}$	-0,0054 (0,0003)***	-0,0069 (0,0002)***
β_{13} $AT_{i,t-1}$	-0,0042 (0,0007)***	-0,0037 (0,0007)***
β_{14} $INFLATION_{j,t-1}$	-0,0117 (0,0150)	-0,0504 (0,0170)***
β_{15} $GDPGROWTH_{j,t-1}$	0,3189 (0,0216)***	0,3369 (0,0187)***
β_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)

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 group, 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 alternative debt measures.

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. 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.

IV.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 ownership structure, 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 group. 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, the presence of a financial institution as the second largest shareholder and 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.

Chapter V

Final Remarks

V.1. Conclusions

Although capital structure has been the subject of a wealth of research, we provide new empirical evidence for better understanding of its determinants, both of a country- and firm-level nature. Specifically, we provide new insight on how macroeconomic and institutional characteristics, as well as corporate strategy and ownership structure, affect firm leverage.

First of all, economic expectations affect corporate debt positively and the risks inherent in the different stages of the lending process (i.e., adverse selection, moral hazard, and default risk) have a direct impact on corporate debt. High transparency between lenders and borrowers and strong legal protection of the two parties involved in the lending relationship facilitate indebtedness. These characteristics simultaneously alleviate the pro-cyclical effect of the expected performance of the economy on debt. Conversely, inefficient insolvency regimes and high rates of default at a country level hamper corporate borrowing. In addition, firms' debt decisions are more sensitive to economic expectations in countries suffering these problems.

In addition, our empirical evidence supports the idea that expansionary monetary measures increase market liquidity and encourage the use of debt. Nevertheless, our results show that there is an optimal level of money supply beyond which additional liquidity

discourages firms from using debt. However, the intensity of the effect of the monetary policy on debt and the level of liquidity at which firms' access to debt financing is maximized depends on the characteristics of the banking system. In countries where banks hold a higher fraction of liquid assets, the effect of the monetary policy on debt is mitigated. By contrast, the relation between the monetary policy and corporate leverage is more pronounced when a higher proportion of banks' resources are allocated to private credit.

Finally, regarding the effect of corporate strategy on corporate leverage, our results highlight that 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 find that 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 nonlinear effect of diversification on debt more pronounced, leading to higher debt when diversification reaches the optimal level.

V.2. Contributions

An important contribution of this dissertation is that all empirical results are obtained using the panel data methodology, which enables us to control for unobservable heterogeneity, which is a problem that affects most economics and finance models. In particular, the use of this estimation method allows us to alleviate the risk of obtaining biased results. By using a panel data estimator, we can control for several effects related with managers' preferences that cannot be observed by the researcher. Some of the individual factors that we can account for are the following: managers' personality traits, managers'

incentives and motivations that derive from their compensation schemes and their stock ownership in the company, managers' expectations and points of view, and managers' need to preserve their socioemotional wealth, which depends on a firm's ownership structure. Simultaneously, the panel data methodology, and more specifically the use of the generalized method of moments (GMM) allows us to control for the possible endogeneity of the explanatory variables.

Another noteworthy contribution is to extend the geographical coverage of previous studies. We include in the analyses firms located in contexts that differ from each other in their macroeconomic expectations and policies, as well as in their institutional and banking system characteristics. The broad coverage of our samples confers an important advantage on our research; namely, we can be more confident that our findings can be generalized to other regions and we can confirm that our results are robust regardless of the type of economy and of country-specific characteristics.

V.3. Implications

Our empirical evidence has important implications for policy-makers given their responsibility for creating proper macroeconomic conditions that facilitate the access of companies to debt financing. Although it is difficult to have a direct influence on economic expectations as they depend on how the economy as a whole evolves, governments and regulators have the necessary power to shape and improve the institutional framework. Our empirical evidence highlights the importance of two types of strategies. On the one hand, policy-makers should promote measures such as the creation of public and private credit registries, and the improvement of information quality and availability of the historical

records contained in these registries. Similarly, public authorities and legislators should design collateral and bankruptcy laws, and modify the existing regulation in these areas, in such a way that the rights of lenders and borrowers are better protected. On the other hand, they should make an effort to speed up the resolution of insolvency and to reduce the amount of nonperforming loans. Deficiencies along these two dimensions would hamper firms' access to debt financing. Moreover, our results suggest that policy-makers should consider banking system characteristics when defining monetary policy measures, given the nonlinear effect of an increase in the amount of money on corporate leverage.

V.4. Thesis

In summary, we can conclude that capital structure is shaped by macroeconomic conditions and firm strategic choices. However, the effects of these variables on corporate debt are moderated by institutional factors and a firm's ownership structure.

Although good economic expectations are necessary to facilitate firm indebtedness, the risks that exist at each stage of the lending process (i.e., adverse selection, moral hazard and default risk), either moderate or exacerbate this dependence. In addition, banking system characteristics, such as banks' liquidity and the allocation of banks' loan portfolios also play a moderating role in the relation between monetary policy measures and firm debt.

Moreover, corporate ownership structure (i.e., family and non-family ownership), also influences the impact of the different diversification strategies (i.e., related and unrelated diversification) on firm indebtedness policies.

To summarize, in light of the empirical evidence provided throughout this document, we can formulate the **thesis** proved in the present piece of research as follows: *"Capital*

structure choices are determined by macroeconomic conditions (at the country-level) and strategic decisions (at the firm-level), and the relations between them are moderated by country-level institutional and banking sector factors, and by firm-level ownership and governance characteristics".

References

Agénor, P., & da Silva, L. P. (2014). Macroprudential regulation and the monetary transmission mechanism. *Journal of Financial Stability, 13*, 44-63.

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

Agrawal, A., & Nagarajan, N. J. (1990). Corporate capital structure, agency costs, and ownership control: The case of all-equity firms. *The Journal of Finance, 45*(4), 1325-1331.

Akbel, B., & Schnitzer, M. (2011). Creditor rights and debt allocation within multinationals. *Journal of Banking & Finance, 35*(6), 1367-1379.

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

An, Z., Li, D., & Yu, J. (2016). Earnings management, capital structure, and the role of institutional environments. *Journal of Banking & Finance, 68*, 131-152.

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.

Anderson, R. C., Duru, A., & Reeb, D. M. (2009). Founders, heirs, and corporate opacity in the US. *Journal of Financial Economics, 92*(2), 205-222.

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

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.

Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: Capital market-oriented versus bank-oriented institutions. *Journal of Financial and Quantitative Analysis, 43(*1), 59-92.

Antzoulatos, A. A., Koufopoulos, K., Lambrinoudakis, C., & Tsiritakis, E. (2016). Supply of capital and capital structure: The role of financial development. *Journal of Corporate Finance, 38*, 166-195.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277-297.

Arnold, M., Wagner, A. F., & Westermann, R. (2013). Growth options, macroeconomic conditions, and the cross section of credit risk. *Journal of Financial Economics, 107*(2), 350-385.

Aysun, U., Brady, R., & Honig, A. (2013). Financial frictions and the strength of monetary transmission. *Journal of International Money and Finance, 32*, 1097-1119.

Ayuso, J., Pérez, D., & Saurina, J. (2004). Are capital buffers pro-cyclical?: Evidence from Spanish panel data. *Journal of Financial Intermediation, 13*(2), 249-264.

Baas, T., & Schrooten, M. (2006). Relationship banking and SMEs: A theoretical analysis. *Small Business Economics, 27*(2-3), 127-137.

Baeriswyl, R., & Cornand, C. (2010). The signaling role of policy actions. *Journal of Monetary Economics, 57*(6), 682-695.

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.

Bassett, W. F., Chosak, M. B., Driscoll, J. C., & Zakrajšek, E. (2014). Changes in bank lending standards and the macroeconomy. *Journal of Monetary Economics, 62*, 23-40.

Bean, C. R., Larsen, J. D., & Nikolov, K. (2002). Financial frictions and the monetary transmission mechanism: Theory, evidence and policy implications. *(January 2002), ECB Working Paper*, No. 113.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2000). A new database on financial development and structure. *World Bank Economic Review, 14*(3), 597-605.

Becker, B., & Ivashina, V. (2014). Cyclicality of credit supply: Firm level evidence. *Journal of Monetary Economics, 62*, 76-93.

Becker, G. S. (1981). Altruism in the family and selfishness in the market place. *Economica, 48*(189), 1-15.

Belke, A., & Beckmann, J. (2015). Monetary policy and stock prices–Cross-country evidence from cointegrated VAR models. *Journal of Banking & Finance, 54*, 254-265.

Belke, A., Freytag, A., Keil, J., & Schneider, F. (2014). The credibility of monetary policy announcements: Empirical evidence for OECD countries since the 1960s. *International Review of Economics & Finance, 33*, 217-227.

Berger, A. N., & Udell, G. F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of Banking & Finance, 22*(6), 613-673.

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

Berger, P. G., Ofek, E., & Yermack, D. L. (1997). Managerial entrenchment and capital structure decisions. *The Journal of Finance, 52*(4), 1411-1438.

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

Berkman, H., Cole, R., & Fu, R. (2009). Expropriation through loan guarantees to related parties: Evidence from China. *Journal of Banking & Finance, 33*(1), 141-156.

Berkman, N. G. (1978). On the significance of weekly changes in M1. *New England Economic Review, 78*, 5-22.

Bernanke, B. S., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *Journal of Economic Perspectives, 9*(4), 27-48.

Bernanke, B. S., & Kuttner, K. N. (2005). What explains the stock market's reaction to Federal Reserve policy? *The Journal of Finance, 60*(3), 1221-1257.

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

Bertrand, M., & Schoar, A. (2006). The role of family in family firms. *Journal of Economic Perspectives, 20*(2), 73-96.

Bhamra, H. S., Kuehn, L., & Strebulaev, I. A. (2010). The aggregate dynamics of capital structure and macroeconomic risk. *Review of Financial Studies, 23*(12), 4187-4241.

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

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115-143.

Boubakri, N., & Ghouma, H. (2010). Control/ownership structure, creditor rights protection, and the cost of debt financing: International evidence. *Journal of Banking & Finance, 34*(10), 2481-2499.

Brown, M., Jappelli, T., & Pagano, M. (2009). Information sharing and credit: Firm-level evidence from transition countries. *Journal of Financial Intermediation, 18*(2), 151-172.

Brummermeier, M. (2009). Deciphering the liquidity and credit crunch 2007-08. *Journal of Economic Perspectives, 23*(1), 77-100.

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.

Cantillo, M., & Wright, J. (2000). How do firms choose their lenders? An empirical investigation. *Review of Financial Studies, 13*(1), 155-189.

Cassar, G., Ittner, C. D., & Cavalluzzo, K. S. (2015). Alternative information sources and information asymmetry reduction: Evidence from small business debt. *Journal of Accounting and Economics, 59*(2), 242-263.

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

Cecchetti, S. G. (1999). Legal structure, financial structure, and the monetary policy transmission mechanism. *Economic Policy Review, 5*(2), 9-28.

Chang, Y. K., Chen, Y. L., Chou, R. K., & Huang, T. H. (2015). Corporate governance, product market competition and dynamic capital structure. *International Review of Economics & Finance, 38*, 44-55.

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

Chava, S., & Roberts, M. R. (2008). How does financing impact investment? The role of debt covenants. *The Journal of Finance, 63*(5), 2085-2121.

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.

Chen, H. (2010). Macroeconomic conditions and the puzzles of credit spreads and capital structure. *The Journal of Finance, 65*(6), 2171-2212.

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

Choe, H., Masulis, R. W., & Nanda, V. (1993). Common stock offerings across the business cycle: Theory and evidence. *Journal of Empirical Finance, 1*(1), 3-31.

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.

Claessens, S., Djankov, S., & Lang, L. H. P. (2000). The separation of ownership and control in East Asian Corporations. *Journal of Financial Economics, 58*(1-2), 81-112.

Coles, J. L., Daniel, N. D., & Naveen, L. (2006). Managerial incentives and risk-taking. *Journal of Financial Economics, 79*(2), 431-468.

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

Cook, D. O., & Tang, T. (2010). Macroeconomic conditions and capital structure adjustment speed. *Journal of Corporate Finance, 16*(1), 73-87.

Cooley, T. F., & Quadrini, V. (2006). Monetary policy and the financial decisions of firms. *Economic Theory, 27*(1), 243-270.

Cornell, B. (1983). The money supply announcements puzzle: Review and interpretation. *The American Economic Review, 73*(4), 644-657.

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

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

Dahya, J., Dimitrov, O., & McConnell, J. (2008). Dominant shareholders, corporate boards, and corporate value: A cross-country analysis. *Journal of Financial Economics, 87*(1), 73-100.

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.

De Jong, A., Kabir, R., & Nguyen, T. T. (2008). Capital structure around the world: The roles of firm-and country-specific determinants. *Journal of Banking & Finance, 32*(9), 1954-1969.

Demirgüç-Kunt, A., & Maksimovic, V. (1999). Institutions, financial markets, and firm debt maturity. *Journal of Financial Economics, 54*(3), 295-336.

Detragiache, E., Garella, P., & Guiso, L. (2000). Multiple versus single banking relationships: Theory and evidence. *The Journal of Finance, 55*(3), 1133-1161.

Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of Financial Economics, 84*(2), 299-329.

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.

Elbourne, A., & de Haan, J. (2006). Financial structure and monetary policy transmission in transition countries. *Journal of Comparative Economics, 34*(1), 1-23.

Erel, I., Julio, B., Kim, W., & Weisbach, M. S. (2012). Macroeconomic conditions and capital raising. *Review of Financial Studies, 25*(2), 341-376.

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

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

Fan, J. P., Titman, S., & Twite, G. (2012). An international comparison of capital structure and debt maturity choices. *Journal of Financial and Quantitative Analysis, 47*(1), 23-56.

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

Fauceglia, D. (2015). Credit market institutions and firm imports of capital goods: Evidence from developing countries. *Journal of Comparative Economics, 43*(4), 902-918.

Ferraris, L., & Watanabe, M. (2012). Liquidity constraints in a monetary economy. *International Economic Review, 53*(1), 255-277.

Fischer, S., & Sahay, R. (2002). Modern hyper-and high inflations. *Journal of Economic Literature, 40*(3), 837-880.

Flannery, M. J. (1986). Asymmetric information and risky debt maturity choice. *The Journal of Finance, 41*(1), 19-37.

Flannery, M. J., & Hankins, K. W. (2013). Estimating dynamic panel models in corporate finance. *Journal of Corporate Finance, 19*, 1-19.

Flannery, M. J., & Rangan, K. P. (2006). Partial adjustment toward target capital structures. *Journal of Financial Economics, 79*(3), 469-506.

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.

Franks, J., Mayer, C., Volpin, P., & Wagner, H. F. (2012). The life cycle of family ownership: International evidence. *Review of Financial Studies, 25*(6), 1675-1712.

Friedman, B. M. (1986). Implications of government deficits for interest rates, equity returns, and corporate financing. *Financing corporate capital formation* (pp. 67-90) University of Chicago Press.

Funchal, B. (2008). The effects of the 2005 bankruptcy reform in Brazil. *Economics Letters, 101*(1), 84-86.

Galí, J., & Gertler, M. (2007). Macroeconomic modeling for monetary policy evaluation. *The Journal of Economic Perspectives, 21*(4), 25-45.

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.

Gertler, M., & Gilchrist, S. (1993). The role of credit market imperfections in the monetary transmission mechanism: Arguments and evidence. *The Scandinavian Journal of Economics, 95*(1), 43-64.

Gertler, M., & Gilchrist, S. (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. *The Quarterly Journal of Economics, 109*(2), 309-340.

Giannetti, M. (2003). Do better institutions mitigate agency problems? Evidence from corporate finance choices. *Journal of Financial and Quantitative Analysis, 38*(1), 185-212.

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

Gonenc, H., Hermes, N., & van Sinderen, E. (2013). Bidders' gains and family control of private target firms. *International Business Review, 22*(5), 856-867.

González, V. M. (2013). Leverage and corporate performance: International evidence. *International Review of Economics & Finance, 25*, 169-184.

González, V. M., & González, F. (2008). Influence of bank concentration and institutions on capital structure: New international evidence. *Journal of Corporate Finance, 14*(4), 363-375.

González, V. M., & González, F. (2014). Banking liberalization and firms' debt structure: International evidence. *International Review of Economics & Finance, 29*, 466-482.

Goodfriend, M. (1991). Interest rates and the conduct of monetary policy. *Carnegie-Rochester Conference Series on Public Policy, 34*, 7-30.

Gospodinov, N., & Jamali, I. (2015). The response of stock market volatility to futures-based measures of monetary policy shocks. *International Review of Economics & Finance, 37*, 42-54.

Graham, J. R., Leary, M. T., & Roberts, M. R. (2015). A century of capital structure: The leveraging of corporate America. *Journal of Financial Economics, 118*(3), 658-683.

Graham, J., & Narasimhan, K. (2004). Corporate survival and managerial experiences during the Great Depression. Unpublished working paper. Duke University, Durham, North Carolina.

Gungoraydinoglu, A., & Öztekin, Ö. (2011). Firm-and country-level determinants of corporate leverage: Some new international evidence. *Journal of Corporate Finance, 17(*5), 1457-1474.

Gust, C., & López-Salido, D. (2014). Monetary policy and the cyclicality of risk. *Journal of Monetary Economics, 62*, 59-75.

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.

Hackbarth, D., Miao, J., & Morellec, E. (2006). Capital structure, credit risk, and macroeconomic conditions. *Journal of Financial Economics, 82*(3), 519-550.

Hafer, R. W. (1986). The response of stock prices to changes in weekly money and the discount rate. *Federal Reserve Bank of St. Louis Review, March*, 5-14.

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

Hannan, T. H., & Berger, A. N. (1991). The rigidity of prices: Evidence from the banking industry. *The American Economic Review, 81*(4), 938-945.

Hardouvelis, G. A. (1987). Macroeconomic information and stock prices. *Journal of Economics and Business, 39*(2), 131-140.

Haug, A. A., & Dewald, W. G. (2012). Money, output, and inflation in the longer term: Major industrial countries, 1880–2001. *Economic Inquiry, 50*(3), 773-787.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics, 31*(1), 405-440.

Hernandez-Canovas, G., & Martinez-Solano, P. (2007). Effect of the number of banking relationships on credit availability: Evidence from panel data of Spanish small firms. *Small Business Economics, 28*(1), 37-53.

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.

Hofmann, B., & Mizen, P. (2004). Interest rate Pass-Through and monetary transmission: Evidence from individual financial institutions' retail rates. *Economica, 71*(281), 99-123.

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.

Houston, J. F., Lin, C., Lin, P., & Ma, Y. (2010). Creditor rights, information sharing, and bank risk taking. *Journal of Financial Economics, 96*(3), 485-512.

Huang, Y., & Shen, C. (2015). Cross-country variations in capital structure adjustment—The role of credit ratings. *International Review of Economics & Finance, 39*, 277-294.

Hughes, J. S., Liu, J., & Liu, J. (2007). Information asymmetry, diversification, and cost of capital. *The Accounting Review, 82*(3), 705-729.

Hyytinen, A., & Väänänen, L. (2006). Where do financial constraints originate from? An empirical analysis of adverse selection and moral hazard in capital markets. *Small Business Economics, 27*(4-5), 323-348.

Jaffee, D. M., & Russell, T. (1976). Imperfect information, uncertainty, and credit rationing. *The Quarterly Journal of Economics, 90*(4), 651-666.

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

Jappelli, T., & Pagano, M. (2002). Information sharing, lending and defaults: Cross-country evidence. *Journal of Banking & Finance, 26*(10), 2017-2045.

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.

Jeon, H., & Nishihara, M. (2015). The effects of business cycle and debt maturity on a firm's investment and default decisions. *International Review of Economics & Finance, 38*, 326-351.

Jõeveer, K. (2013). Firm, country and macroeconomic determinants of capital structure: Evidence from transition economies. *Journal of Comparative Economics, 41*(1), 294-308.

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.

Kahle, K. M., & Stulz, R. M. (2013). Access to capital, investment, and the financial crisis. *Journal of Financial Economics, 110*(2), 280-299.

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

Kashyap, A. K., & Stein, J. C. (1997). The role of banks in monetary policy: A survey with implications for the European monetary union. *Economic Perspectives-Federal Reserve Bank of Chicago, 21*, 2-18.

Kashyap, A. K., & Stein, J. C. (2000). What do a million observations on banks say about the transmission of monetary policy? *The American Economic Review, 90*, 407-428.

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.

Keefe, M. O. C., & Yaghoubi, M. (2016). The influence of cash flow volatility on capital structure and the use of debt of different maturities. *Journal of Corporate Finance, 38*, 18-36.

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.

Kim, W. S., & Sorensen, E. H. (1986). Evidence on the impact of the agency costs of debt on corporate debt policy. *Journal of Financial and Quantitative Analysis, 21*(2), 131-144.

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

Kirch, G., & Terra, P. R. S. (2012). Determinants of corporate debt maturity in South America: Do institutional quality and financial development matter? *Journal of Corporate Finance, 18*(4), 980-993.

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

Kiyotaki, N., & Moore, J. (1997). Credit cycles. *The Journal of Political Economy, 105*(2), 211-248.

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.

Korajczyk, R. A., & Levy, A. (2003). Capital structure choice: Macroeconomic conditions and financial constraints. *Journal of Financial Economics, 68*(1), 75-109.

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.

Kwapil, C., & Scharler, J. (2013). Expected monetary policy and the dynamics of bank lending rates. *International Review of Economics & Finance, 27*, 542-551.

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.

Laeven, L., & Levine, R. (2008). Complex ownership structures and corporate valuations. *Review of Finance Studies, 21*(2), 579-604.

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 US and Japanese firms: Agency and stewardship perspectives. *Academy of Management Journal, 46*(2), 212-225.

Leon, F. (2015). Does bank competition alleviate credit constraints in developing countries? *Journal of Banking & Finance, 57*, 130-142.

Levy, A., & Hennessy, C. (2007). Why does capital structure choice vary with macroeconomic conditions? *Journal of Monetary Economics, 54*(6), 1545-1564.

Lewellen, K. (2006). Financing decisions when managers are risk averse. *Journal of Financial Economics, 82*(3), 551-589.

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.

Li, D., & Ferreira, M. P. (2011). Institutional environment and firms' sources of financial capital in central and eastern europe. *Journal of Business Research, 64*(4), 371-376.

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.

Lothian, J. R. (1985). Equilibrium relationships between money and other economic variables. *The American Economic Review, 75*(4), 828-835.

Lothian, J. R. (2014). Monetary policy and the twin crises. *Journal of International Money and Finance, 49*, 197-210.

Lothian, J. R., & McCarthy, C. H. (2009). The behavior of money and other economic variables: Two natural experiments. *Journal of International Money and Finance, 28*(7), 1204-1220.

Love, I., & Pería, M. S. M. (2015). How bank competition affects firms' access to finance. *The World Bank Economic Review, 29*(3), 413-448.

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

Lynge Jr, M. J. (1981). Money supply announcement and stock prices. *The Journal of Portfolio Management, 8*(1), 40-43.

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.

Marsh, P. (1982). The choice between equity and debt: An empirical study. *The Journal of Finance, 37*(1), 121-144.

Massa, M., & Zhang, L. (2013). Monetary policy and regional availability of debt financing. *Journal of Monetary Economics, 60*(4), 439-458.

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.

McCrum, D., & Jackson, G. (2016). S&P says corporate credit conditions worsening at fastest pace since crisis. *Financial Times*, January 12. Retrieved from https://www.ft.com/content/cdfa7c90-b925-11e5-b151-8e15c9a029fb

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.

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.

Mild, A., Waitz, M., & Wöckl, J. (2015). How low can you go?—Overcoming the inability of lenders to set proper interest rates on unsecured peer-to-peer lending markets. *Journal of Business Research, 68*(6), 1291-1305.

Mishra, P., Montiel, P. J., & Spilimbergo, A. (2012). Monetary transmission in low-income countries: Effectiveness and policy implications. *IMF Economic Review, 60*(2), 270-302.

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.

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics, 5*(2), 147-175.

Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance, 39*(3), 574-592.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*(2), 187-221.

Narayanan, M. P. (1988). Debt versus equity under asymmetric information. *Journal of Financial and Quantitative Analysis, 23*(1), 39-51.

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.

Öztekin, Ö, & Flannery, M. J. (2012). Institutional determinants of capital structure adjustment speeds. *Journal of Financial Economics, 103*(1), 88-112.

Öztekin, Ö. (2015). Capital structure decisions around the world: Which factors are reliably important? *Journal of Financial and Quantitative Analysis, 50*(3), 301-323.

Padilla, A. J., & Pagano, M. (1997). Endogenous communication among lenders and entrepreneurial incentives. *Review of Financial Studies, 10*(1), 205-236.

Padilla, A. J., & Pagano, M. (2000). Sharing default information as a borrower discipline device. *European Economic Review, 44*(10), 1951-1980.

Pagano, M., & Jappelli, T. (1993). Information sharing in credit markets. *The Journal of Finance, 48*(5), 1693-1718.

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.

Patelis, A. D. (1997). Stock return predictability and the role of monetary policy. *Journal of Finance, 52*(5), 1951-1972.

Pearce, D. K., & Roley, V. V. (1983). The reaction of stock prices to unanticipated changes in money: A note. *The Journal of Finance, 38*(4), 1323-1333.

Pearce, D. K., & Roley, V. V. (1985). Stock prices and economic news. *Journal of Business, 58*, 49-67.

Pindado J, & Rodrigues L. (2004). Parsimonious models of financial distress in small companies. *Small Business Economics, 22*(1), 51-66.

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.

Pindado, J., Rodrigues, L., & de la Torre, C. (2006). How does financial distress affect small firms' financial structure? *Small Business Economics, 26*(4), 377-391.

Pindado, J., Rodrigues, L., & de la Torre, C. (2008). Estimating financial distress likelihood. *Journal of Business Research, 61*(9), 995-1003.

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance, 50*(5), 1421-1460.

Ramos-Tallada, J. (2015). Bank risks, monetary shocks and the credit channel in brazil: Identification and evidence from panel data. *Journal of International Money and Finance, 55*, 135-161.

Rauch, J. H., & Hendrickson, J. M. (2004). Does bank consolidation hurt the small business borrower? *Small Business Economics, 23*(3), 219-226.

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.

Sapienza, P. (2002). The effects of banking mergers on loan contracts. *The Journal of Finance, 57*(1), 329-367.

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.

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.

Sellin, P. (2001). Monetary policy and the stock market: Theory and empirical evidence. *Journal of Economic Surveys, 15*(4), 491-541.

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. (1992). Liquidation values and debt capacity: A market equilibrium approach. *The Journal of Finance, 47*(4), 1343-1366.

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.

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfect information. *The American Economic Review, 71*(3), 393-410.

Strahan, P. E., & Weston, J. P. (1998). Small business lending and the changing structure of the banking industry. *Journal of Banking & Finance, 22*(6), 821-845.

Strebulaev, I., & Yang, B. (2013). The mystery of zero-leverage firms. *Journal of Financial Economics, 109*(1), 1-23.

Tan, Z., Yao, Y., & Wei, S. (2015). Financial structure, corporate savings and current account imbalances. *Journal of International Money and Finance, 54*, 142-167.

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

Thorbecke, W. (1997). On stock market returns and monetary policy. *The Journal of Finance, 52*(2), 635-654.

Thorburn, K. S. (2000). Bankruptcy auctions: Costs, debt recovery, and firm survival. *Journal of Financial Economics, 58*(3), 337-368.

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance, 43*(1), 1-19.

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

Tsai, C. (2014). The effects of monetary policy on stock returns: Financing constraints and "informative" and "uninformative" FOMC statements. *International Review of Economics & Finance, 29*, 273-290.

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.

Welch, I. (2004). Capital structure and stock returns. *Journal of Political Economy, 112*(1), 106-132.

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.

Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics, 105*(3), 581-606.

Woodford, M. (2003). Optimal interest-rate smoothing. *The Review of Economic Studies, 70*(4), 861-886.

Yang, T.H., Hsu, J., Yang, W.B. (2016). Firm's motives behind SEOs, earnings management, and performance. *International Review of Economics & Finance, 43*, 160-169.

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.

Zmijewski, M. (1984). Methodological issues related to the estimation of financial distress prediction models. *Journal of Accounting Research, 22*, 59-86.

V.1. Conclusiones

Aunque gran parte de la investigación en finanzas se ha enfocado en la estructura de capital, nosotros proporcionamos nueva evidencia empírica para un mejor entendimiento de sus determinantes, tanto a nivel país como a nivel empresa. Específicamente, nosotros damos una nueva visión sobre la forma en la que factores macroeconómicos e institucionales, así como la estrategia corporativa y la estructura de propiedad afectan el apalancamiento corporativo.

En primer lugar, las expectativas económicas tienen un efecto positivo sobre la deuda de las empresas, al mismo tiempo que los riesgos inherentes a las diferentes etapas del proceso de financiación (es decir, selección adversa, riesgo moral y riesgo de incumplimiento) tienen un impacto directo sobre el endeudamiento de las empresas. Mayor transparencia entre prestamistas y prestatarios, así como un mayor grado de protección legal de las dos partes involucradas en dicho proceso, facilitan el endeudamiento. De manera simultánea, estas características mitigan el efecto procíclico del desempeño esperado de la economía sobre la deuda. Por el contrario, regímenes de insolvencia ineficientes y altas tasas de impagos, a nivel país, dificultan el acceso al crédito. Adicionalmente, las decisiones de financiación de las empresas serán más sensibles a las expectativas económicas en aquellos países que sufren dichos problemas.

Igualmente, según nuestra evidencia empírica, una política monetaria expansiva incrementa la liquidez en los mercados e incentiva el endeudamiento. Sin embargo, nuestros resultados muestran que existe un nivel óptimo de crecimiento de dinero en circulación, a partir del cual inyectar liquidez adicional desincentiva el uso de deuda por parte de las empresas. En este sentido, es importante tener en cuenta que la intensidad del efecto de la política monetaria sobre el endeudamiento de las empresas y el nivel óptimo en

el cual se maximiza la deuda corporativa dependen de las características del sistema bancario de cada país. En países donde los bancos tienen mayores niveles de liquidez, el efecto de la política monetaria sobre la deuda corporativa se mitiga. Por el contrario, la relación entre la política monetaria y el apalancamiento de las empresas es más fuerte en países donde los bancos destinan una mayor proporción de sus recursos a crédito privado.

Finalmente, con respecto al efecto de la estrategia corporativa sobre la deuda de las empresas, nuestros resultados muestran que la diversificación relacionada tiene un efecto negativo sobre la deuda de las empresas no familiares y un efecto no lineal en empresas familiares. La diversificación no relacionada tiene un efecto no lineal en la deuda, independientemente de la estructura de propiedad corporativa, pero el efecto positivo es más fuerte en las empresas familiares. Además, encontramos que en empresas familiares en las que el segundo mayor accionista es una entidad financiera, así como en aquellas dirigidas por su propietario, la relación entre la diversificación y el endeudamiento es más fuerte. Ambas características de gobierno corporativo hacen que el efecto positivo de la diversificación sobre la deuda sea más pronunciado, lo que implica mayores niveles de deuda cuando se alcanza el nivel óptimo.

V.2. Contribuciones

Una contribución de este trabajo que debe destacarse radica en que todos los resultados se obtienen mediante la metodología de datos de panel, permitiéndonos controlar la heterogeneidad inobservable, que es un problema que afecta a la mayoría de los modelos económicos y financieros. Concretamente, el uso de este método de estimación nos permite aliviar el riesgo de obtener resultados sesgados. En consecuencia, podemos controlar diversos efectos relacionados con las preferencias de los directivos que no son observables

por los investigadores. Algunos de estos efectos individuales que posemos controlar son: características personales de los directivos, incentivos y motivaciones derivadas de sus esquemas de compensación y de su participación en la propiedad, sus expectativas y opiniones, así como su necesidad de preservar su riqueza socio emocional, la cual depende de la estructura de propiedad de la empresa. Simultáneamente, la metodología de datos de panel, y de manera específica el uso del método generalizado de los momentos (MGM) nos permite controlar posibles problemas de endogeneidad de las variables explicativas.

Otra importante contribución consiste en extender la cobertura geográfica de estudios anteriores. Para ello, incluimos en nuestros análisis empresas localizadas en una amplia diversidad de contextos, en lo referente a expectativas y políticas macroeconómicas, así como diversos entornos institucionales y sistemas bancarios con características diferentes. Esta amplia cobertura garantiza que nuestros resultados pueden generalizarse a otras regiones, así como tener la certeza de que nuestros hallazgos son robustos, independientemente del tipo de economía y de las características específicas de cada país.

V.3. Implicaciones

Nuestra evidencia empírica tiene importantes implicaciones para los encargados de la formulación de la política económica, dada su responsabilidad en la creación de condiciones macroeconómicas que faciliten el acceso a deuda de las empresas. Si bien es cierto que es difícil ejercer una influencia directa en las expectativas económicas, pues éstas dependen de la economía en su conjunto, los gobiernos y entes reguladores tienen el poder necesario para conformar y mejorar el marco institucional. En este sentido, nuestra evidencia empírica destaca la importancia de dos tipos de estrategias. Por una parte, los encargados de definir las políticas deben promover medidas como la creación y mejora de

los registros públicos y privados que contengan suficiente información del historial crediticio de los deudores. Asimismo, las autoridades públicas y legisladores deben diseñar y mejorar las leyes sobre quiebras, de tal manera que los derechos de prestamistas y prestatarios estén mejor protegidos.

Por otra parte, es necesario reducir los tiempos y costes para solucionar situaciones de insolvencia y reducir la cantidad de créditos impagables. Deficiencias en estas dos dimensiones dificultan el acceso a la deuda por parte de las empresas. Adicionalmente, nuestros resultados sugieren que los responsables de definir la política monetaria deben considerar las características del sistema bancario de su país a la hora de adoptar medidas monetarias, dado el impacto no lineal de las expansiones de dinero sobre el apalancamiento corporativo.

V.4. Tesis

En resumen, podemos concluir que la estructura de capital de las empresas está determinada por condiciones macroeconómicas y por las decisiones estratégicas que toman las propias empresas. Sin embargo, los efectos de estas variables en la deuda corporativa están moderados por factores institucionales y por la estructura de propiedad de las empresas.

Aunque las buenas expectativas económicas son necesarias para facilitar el endeudamiento de las empresas, los riesgos que existen en cada una de las etapas del proceso de financiación (es decir, selección adversa, riesgo moral o riesgo de incumplimiento) pueden reducir o incrementar dicha dependencia. Más aún, las características del sistema financiero, tales como el nivel de liquidez de los bancos y la forma como estos configuran sus portafolios crediticios también juegan un papel

moderador en la relación entre las decisiones sobre política monetaria y la deuda de las empresas.

Por otra parte, la estructura de propiedad de las empresas (es decir, empresas familiares y no familiares) también modera el impacto de las diferentes estrategias de diversificación (diversificación relacionada y no relacionada) sobre las políticas de endeudamiento de las empresas.

En conclusión y a la luz de la evidencia empírica proporcionada a lo largo de este documento, podemos formular la siguiente **tesis** contrastada en esta investigación: "*Las decisiones concernientes a la estructura de capital de las empresas están determinadas por condiciones macroeconómicas (a nivel país) y por decisiones estratégicas (a nivel empresa), y dichas relaciones están moderadas por factores institucionales a nivel país y a nivel empresa por la estructura de propiedad y características de gobierno corporativo*".

Resumen

En la presente tesis, se exponen nuevas evidencias empíricas sobre los determinantes de la estructura de capital de las empresas. En este sentido, se explora el efecto de factores macroeconómicos, a nivel país, y de la estrategia corporativa, a nivel empresa, en las decisiones de endeudamiento de las empresas. Dichas relaciones se encuentran moderadas por el entorno institucional y por la estructura de propiedad corporativa.

Específicamente, el efecto de las expectativas económicas sobre la deuda está moderado por los diferentes riesgos presentes a través del proceso de financiación (es decir, selección adversa, riesgo moral y riesgo de incumplimiento). Igualmente, el efecto no lineal de la política monetaria sobre la estructura de capital de las empresas se encuentra moderado por las características propias del sistema financiero de cada país; concretamente, el nivel de liquidez de los bancos y la forma como estos conforman su portafolio de crédito.

En lo concerniente al efecto de la estrategia corporativa (es decir, estrategias de diversificación relacionada y no relacionada) sobre la política de financiación de las empresas, dicha relación está moderada por el tipo de propiedad (empresas familiares y no familiares) y por características propias de cada empresa en lo referente a su gobierno corporativo.