

Capital structure in family firms: the role of innovation activity and institutional investors

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Abstract

Purpose – There is still an ongoing debate on the value relevance of capital structure and its determinants. Recently the issue has been explored in family firms after being explored in mature firms. This paper investigates the role of institutional investors and the firm's innovation activity in influencing the firm's decision and ability to acquire debt capital.

Design/methodology/approach – A large sample of 700 privately-held family firms in Italy from 2010 to 2019. Two analysis techniques are used: panel analysis and path analysis. The value of debt and the debt ratio are used as leverage measures. The value of patent (as a proxy for innovation) and institutional investor are the explanatory variables.

Findings – The results show that institutional investors have no relationship with financial leverage measures except when controlling for an interaction variable (Institutional investors \times Lombardy region). The patent value is positively correlated with debt; however, the ratio patent-to-asset is negatively related to financial leverage indicating higher risk exposure. The nonlinearity test demonstrates a turning point when the relationship between patent value and debt inverts.

Practical implications – Firms should monitor their innovation activity since excessive innovation increases risk exposure and affects financing opportunities and value. The involvement of institutional investors does not always enhance value.

Originality/value – Existing literature focuses separately on family firm innovations and financial leverage as outcome variables, emphasizing the role of institutional investors in both fields by adopting agency theory and socioemotional wealth framework. In this study, the authors go further by merging both relationships, investigating the dynamics of the institutional-family firm innovation relationship in influencing the firm's capital structure. The authors contribute to the ongoing debate by providing original findings on capital structure, governance and innovation, supported by rigorous methods to enhance family firms' decision-making.

Keywords Family firms, Debt, Leverage, Governance indicator, Innovation activity, Panel analysis, Path analysis, Italy

Paper type Research paper

1. Introduction

Family businesses are vital for a healthy economy. Globally they are the most diffused form of business (Gersick *et al.*, 1997), contributing to 40–60% of GDPs and 35–70% of job generation (Van Gils *et al.*, 2008). Family firms have received much attention regarding governance structure and financial performance in the past decades. The family business has been studied from different perspectives and approaches (Astrachan and Jaskiewicz, 2008; Faccio and Lang, 2002; Fernando *et al.*, 2013; Vazquez and Rocha, 2018; Zahra and Sharma, 2004). Different issues have been dealt with separately, focusing only on one single theory or

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framework. Institutional, agency and socioemotional wealth theories have been trying to explain the dynamics of governance structure and innovations in family firms and the potential agency conflicts (managers vs owners, large vs small shareholders, shareholders vs credit holders). Yet, there are still some gaps that need to be explored. Due to institutional, ownership and financial factors, family firms are seen to have a different financial structure that is mainly composed of owners' equity and bank financing. [Stockmans *et al.* \(2010\)](#) state that family owners would be willing to forego economic performance to preserve the family's Socioemotional Wealth (SEW). [Blanco-Mazagatos *et al.* \(2007\)](#) show that family firms will increase their debt capital even though raising equity from outside shareholders may be more efficient to preserve family control. Financial performance and capital structure in family firms are not linear but a complex decision depending on various considerations.

One of the gaps in family business literature concerns the research investigating innovation activity. Family firms' innovation has been explored in the last decade as it is highly relevant from a theoretical and practical point of view. Still, no studies approach this topic that investigate the relationships among institutional investors, capital structure and innovation activity.

Considering the current theoretical and practical relevancy of innovation in family businesses, this paper focuses on the relationships among institutional investors, capital structure and innovation activity to fill the literature gap and develop a future research agenda aimed at suggesting major research avenues to guide future theoretical and empirical research toward a better understanding of innovation in the context of family firms.

In the same regard, the research on the dynamics of the capital structure in family firms has not captured all factors affecting it, and no conclusive findings are provided. Therefore, in this study, we establish a framework in which the dynamics of leverage in family firms could be explained by two prominent factors highly relevant to family firms: institutional ownership and innovation activity. The choice of the two factors is stemmed from their importance in family and nonfamily firms and their impact on firms' financial performance. Furthermore, the selected factors could not be entirely exogenous in family firms' capital structure (institutional investors could affect leverage through innovation channels). Previous studies show that institutional investors could be attracted by a firm's innovation activity that might affect the firm's capital structure by enhancing debt negotiations and opening more financing channels. Given the shape of the capital structure in family firms and their limited access to external finance, investigating the relationship between innovation and debt structure in family firms essential and helps bridge the gap in family firms' innovation in attracting new external finance.

Accordingly, this paper contributes to the ongoing debate by providing original linkage and findings on leverage, governance and innovation, supported by rigorous methods to enhance family firms' decision-making. We provide an up-to-date analysis of institutional investors' role and innovation in determining a firm's leverage; we use a large panel of 700 firms for ten years. Additionally, we provide path analysis showing how each variable would affect leverage individually and jointly with mediation.

Based on the introduction of the firm's capital structure and its relationship to innovation and institutional investors, we establish a framework to understand how both factors (innovation and institutional investors) could affect leverage in family firms, separately and jointly.

- (1) Through investigating the impact of ownership structure and innovation on the firm's capital structure, this study aims to:
- (2) Investigate whether the involvement of institutional investors in the firm affects the debt levels in the firm's capital structure.

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- (3) Examine whether a firm's innovation activity is a means to attract external debt finance.
 - (4) Map the potential interactions between innovation, institutional investors and financial variables in determining a firm's leverage.

Responding to the above points, starting from our theoretical framework, this paper aims to integrate divergent theories within a broad framework to help the doctrinal debate investigating the role of institutional investors and the firm's innovation activity in determining the firm's capital structure. We find that institutional investors' existence has no impact on the capital structure except when we control an interaction variable (institutional investors in the Lombardy region). Patent value is positively correlated with Debt, but the ratio of patent-to-asset is not. Moreover, the nonlinearity test demonstrates a turning point when the relationship between patent value and capital structure is inverted. Path analysis also provides consistent findings, emphasizing the paths through which governance and innovations could affect leverage in family firms. Financial variables such as EBITDA, Tangibles and Intangibles explain a firm's capital structure.

The rest of the paper is organized as follows: section two covers the related literature on innovation and institutional investors; section three describes data and the methodological approach; section four presents the results and discussion; and finally, in section five, conclusions, implications and suggestions for future research are presented.

2. Literature review

Family firms are described in the literature as having a different financial structure from other quoted companies. Literature provides several studies dedicated to the family firms' financial structures (Fitó *et al.*, 2013; Pindado *et al.*, 2015). Some studies have found that family firms adopt highly conservative strategies. Zellweger (2007) describes how family firms have a longer time horizon than nonfamily companies. Zellweger confirms that the possibility of having a long-term investment horizon is a distinctive feature of the family firms and a clear competitive advantage. López-Gracia and Sánchez-Andújar (2007) for instance, considering the case of Spain, confirm that nonfamily firms approach their level of optimal debt more slowly than do family firms, suggesting that being a family firm reduces agency costs and gives the firm more opportunities to gain access to lender resources (Poza *et al.*, 2004).

Other studies, concerning different national frameworks, have confirmed the distinct financial behaviors of family firms, indicating that a business's family nature significantly affects its debt level. Gallo *et al.* (2004), using a sample of the top Spanish family firms, concluded that family firms follow a particular financial logic. In the study, family firms demonstrated a specific resistance to risk, apparent in their more restricted use of full-time permanent personnel and their considerably lower level of debt than nonfamily firms. Zata Poutziouris (2001) uses a univariate statistical analysis on empirical evidence to show that family firms are systematically more dependent on internally generated funds. Mahéroul (2000), comparing the "investment functions" (debt, profit and liquidity) among 49 French family firms listed on the stock market and 46 French family firms that were not listed for several years, found that a third of the businesses preferred to forego development rather than lose autonomy. Gallo and Vilaseca (1996), using a sample of 104 Spanish family firms, found that the smaller firms followed less complex financial practices and had low debt ratios. Finally, studies such as those of Memili *et al.* (2010) and Zahra (2005) refer to risk-taking in family firms and argue that risk plays a role in a firm's image and performance. If debt affects risk, it is essential to highlight the effects of inserting a debt recording regulation into firms' balance sheets.

The impact of ownership type on a firm's strategy and performance has long been debated in the literature regarding the potential effect on business decisions (Landry *et al.*, 2013;

Miller *et al.*, 2011). Since Baumol (1962), studies have compared owner-controlled to manager-controlled firms based on the premise that owner control reduces agency costs and fosters growth (Jensen and Meckling, 1976a; Morck *et al.*, 1988), but this gives rise to entrenchment and conservatism (Le Breton-Miller and Miller, 2008; Morck *et al.*, 2005; Volpin, 2002). According to Romano *et al.* (2001), it is possible to observe how a comprehensive review of the existing interdisciplinary literature at the international level highlights the existence of a complex array of factors able to influence the financial decision of small-medium enterprises (SMEs) and family firms (Florackis and Ozkan, 2009; Frank and Goyal, 2009; González and González, 2008; Harasheh and De Vincenzo, 2022; De Miguel and Pindado, 2001; Setia-Atmaja *et al.*, 2009).

Innovation is essential for all firms' growth and survival (Cefis and Marsili, 2006; Schumpeter, 1934; Wolfe, 1994). Family businesses are one of the most complex forms of business (Neubauer and Lank, 1998), and thus innovation researchers have to deal with this specific group separately. Limited aspects of innovation in the family business have been so far investigated, such as the impact of organizational culture, the influence of human-related antecedents on innovation capacity, institutional corruption and innovation and the role of human capital (Dana *et al.*, 2014). Given the shape of the capital structure in family firms and their limited access to external finance, investigating the relationship between innovation and debt structure in family firms essential and helps bridge the gap in family firms' innovation in attracting new external finance.

2.1 Capital structure: finance theories

An essential issue in corporate finance concerns the optimal capital structure to maximize firm value. The choice between debt and equity is strategic for corporate managers (Graham and Harvey, 2001).

Most studies' theoretical background on the financial structure is based on trade-off (TOT) and pecking order theories (POT), which have a complementary approach. Both theories explain the financing variations among enterprises with their corporate characteristics (Fama and French, 2002; King and Peng, 2013).

Trade-off theory is constructed according to the model of Modigliani and Miller (1958), which was later revised to incorporate financial frictions such as taxes (Modigliani and Miller, 1963) and the cost of financial distress (Kraus and Litzenberger, 1973).

In its static version, Burgstaller and Wagner (2015) observed that TOT assumes an optimal leverage level at which managers balance the costs and benefits of debt. At such an optimal level, the firm's value is maximized when the marginal benefits from tax savings equal the marginal cost of financial distress (Fama and French, 2002; Jensen and Meckling, 1976b; Myers, 2001; Stulz, 1990). Following Burgstaller and Wagner (2015), dynamic aspects enter the model by considering adjustment costs (Fischer *et al.*, 1989), which induce an additional trade-off between deviating from the target capital structure and the costs of adjusting toward it. Thus, deviations from the target debt ratio are only gradually corrected over time (Frank and Goyal, 2007). In short, trade-off theory suggests, as Benkraiem and Gurau (2013) observed, that the capital structure results from rational decisions that attempt to balance the costs and advantages of leverage. Corporate managers try to maximize firm value by reaching an optimal debt ratio, in which the marginal value of debt benefits exactly offsets the costs of issuing more debt (Myers, 2001). This trade-off choice considers three financial elements: tax shields, bankruptcy costs and agency costs. An increase in debt will reduce the firm's tax liability and increase the after-tax payments to capital providers.

According to POT Myers (1984) and Myers and Majluf (1984), due to asymmetric information among different market players (managers, debtholders and stockholders), firms rely firstly on internal funds from free cash flows and retained earnings and then on external

funds (debts then equity) after the exhaustion of the internal funds. POT has no assumptions regarding an optimal leverage ratio (Degryse *et al.*, 2012; Fama and French, 2002). Therefore, capital structure is driven by the firm's ability to generate profits and capital needs. In this regard, POT assumes that more profitable firms are less indebted, which means a negative association between profitability and leverage, empirically confirmed, e.g. by Rajan and Zingales (1995) and Fama and French (2002). In short, this theory suggests that firms have a particular preference order for financing decisions. Since corporate managers are generally better informed than external investors about the firm's true value and perspectives, the costs of finance will vary according to different financing decisions. Applying this strategy based on various financial sources' pecking order enables the manager to maintain corporate control and operational independence. Pecking order theory can explain why the less profitable firms generally have more debt: they lack internal funds and debt costs less than external equity. Unlike trade-off theory, pecking order theory does not suggest a target leverage ratio.

As Benkraiem and Gurau (2013) state, these two theories are complementary. The pecking order theory is based on information asymmetry problems, representing a part of the costs considered in the trade-off theory. Consequently, the usefulness of these theories in explaining financing decisions depends on the importance of information asymmetry problems. When these problems dominate other costs, the pecking order theory prevails and vice versa. However, the relative importance of a theory does not render the second one useless. Indeed, recent studies emphasize the possibility of their coexistence and compatibility (Berggren *et al.*, 2000; Holmes and Kent, 1991; Watson and Wilson, 2002; Zoppa and McMahon, 2014).

Based on this theoretical background, POT and TOT could be linked through the agency theory approach. Given that agency conflict could be less marked in small and family businesses (due to the aggregation of management and ownership), equity financing and internal free cash flows become less relevant in this context (Ang, 1992; Fama and French, 2002; Jensen, 1986; Jensen and Meckling, 1976b). However, agency conflicts between owners and debtholders could emerge when debt financing is introduced, creating a considerable agency cost that affects the cost of debt (Jensen and Meckling, 1976b; Myers, 1977). Others focus on cash holdings and their relationship to SMEs' performance, suggesting a further extension to family firms due to the particular governance structure (Dimitropoulos *et al.*, 2020).

Moreover, such theoretical frameworks help define the variables explaining leverage dynamics in SMEs and family firms. Degryse *et al.* (2012), López-Gracia and Sogorb-Mira (2008), Michaelas *et al.* (1999) and Sogorb-Mira (2005), for example, favor the POT. However Mc Namara *et al.* (2017) and Sardo and Serrasqueiro (2017) favor TOT in explaining capital structure dynamics in family firms. Harasheh and De Vincenzo (2022) support TOT in a sample of Italian SMEs with an innovative approach using the dose-response function and show that SMEs are underleveraged. In this sense, the applicability of traditional theories in explaining family firms' leverage is obscured by specific financing constraints and motivations not present for larger firms.

2.2 The role of institutional investors

Generally, two main factors might explain the lower institutional investor participation in family-controlled businesses. First, a high level of family ownership prevents institutional investors from investing in family-controlled businesses. Second, institutional investors may avoid family-controlled businesses; institutional investors prefer large firms with high liquidity (Gompers and Metrick, 2001). Institutional investors looking for liquidity and taking significant control positions are unattractive (Coffee, 1991).

Several studies concerning institutional investors' role in a firm's decisions include agency cost (Jensen, 1986; Stulz, 1990) and information asymmetry (Myers and Majluf, 1984). The studies are based on the fact that an increase in the importance of long-term institutional investors to a firm will improve monitoring and information disclosures.

Cleary and Wang (2017) demonstrated that firms with a relatively larger long-term institutional investor base have lower investment outlays and higher dividends while maintaining lower cash and higher debt levels than firms with a more transient shareholder base.

According to Eaton *et al.* (2014), Gaspar *et al.* (2005) and Hao (2014), the reduction of agency costs is only associated with improved monitoring or improved information asymmetry or both (Attig *et al.*, 2013; Elyasiani and Jia, 2010). There is no evidence that the existence of institutional investors has an impact on a firm's leverage.

In the context of family firms, institutional investors' existence enhances reducing asymmetric information but with no clear-cut conclusion about the impact on capital structure. However, others argue that, based on agency theory, family firms do not like external ownership, which reduces agency costs. The institutional theory might also play a role in family firms, in which institutional investors help family firms to absorb regulatory shocks. In many cases, institutional investors avoid investing in family firms (Colot and Bauweraerts, 2016; Fernando *et al.*, 2013). Cronqvist and Nilsson (2003) and Young *et al.* (2008) highlight the complexities in family firms when institutional investors are engaged. More generally, ownership structure and capital structure have been studied in SMEs at different ownership levels; studies find that ownership and leverage have no linear relationship. There is a causality between the two variables (Wellalage and Locke, 2015). In the same context, Badrinath *et al.* (1996) and Skinner (1989) found that higher leverage is associated with institutional investors' higher involvement in family firms, while Fernando *et al.* (2013) found the opposite. The following hypothesis is formulated accordingly.

H1. There is a positive relationship between institutional investors (INST) and leverage in family firms.

In this hypothesis, we test whether the involvement of INST in family firms changes the capital structure; in particular, we investigate to what extent the participation of INST may open new debt channels with banks since family firms become backed by INST.

2.3 *The role of innovation*

Some family firms tend not to take risks, conditioning their innovative actions for this reason (Casprini *et al.*, 2017; Zahra and Sharma, 2004). On the other hand, some argue that family firms are not necessarily less innovative than nonfamily businesses. Over time, they may become more innovative and aggressive in their markets than nonfamily businesses (Filser *et al.*, 2016). The question of how family businesses manage innovation and avoid path dependency traps remains largely unanswered (Dieleman, 2019; Núñez-Cacho and Lorenzo, 2020).

Firms no longer depend merely on their internal activities to innovate. Instead, they are accessing external resources or even, in some cases adopting an open innovation (OI) model. This situation requires firms to manage the inbound and outbound flows of knowledge necessary to develop innovation, reducing risks and costs (Chesbrough and Schwartz, 2015). Giudice and Maggioni (2014) shed light on pluralism as a driving force in the knowledge economy pushes firms in a cumulative process of adaptation and re-creation through innovative means of social interaction in global environments. Abdulkader *et al.* (2020) focus on value co-creation by integrating OI principles and mechanisms of value systems Orlando *et al.* (2021) confirm that open innovation fosters patenting activity. Casprini *et al.* (2017) studied the challenges in acquiring and transferring knowledge in OI processes and

developed two distinctive capabilities – labeled imprinting and fraternization – that helped the family firm (case study) overcome the barriers to knowledge acquisition and transfer.

Regarding R&D, [Dong et al. \(2021\)](#) show that family ownership has an inverted U-shaped relationship with cooperative R&D and political ties moderate the relationship; steeper in firms with more political ties than in firms with fewer political ties. [Thrassou et al. \(2018\)](#) introduced the concept of Agile Innovation in family firms indicating that these organizations have an inherent disposition toward agile innovation, with multicultural management acting as the agent of equilibrium. [Carnes and Ireland \(2013\)](#) theorize that resource pooling is a mediator between family and innovation. [Penney and Combs \(2013\)](#) add that family structure affects how different families are involved in grouping processes that help or slow down innovation. From the above discussion, it appears that no conclusions have been drawn on the motives, uses and benefits of innovations in family firms.

On the other hand, some authors underline several aspects that make debt unsuitable for financing innovation ([David et al., 2008](#); [Hall and Lerner, 2010](#)). These authors highlight that debt, even though it is one of the most popular forms of financing among small technology companies and large companies, is not appropriate for innovation because innovation is intrinsically risky, generates firm-specific assets and is non-re-deployable to different uses. [Hall and Lerner \(2010\)](#), [Lööf \(2009\)](#) and [O'Brien \(2003\)](#) affirm that debt financing is negatively correlated with the probability of being an innovative company. However [David et al. \(2008\)](#) recognize that debt plays an essential role in innovation. It acts as a disciplinary mechanism, and the effects of debt on innovation depend on the monitoring mechanism adopted by debt holders. [Ibrahim \(2010\)](#) suggests that debt is not an uncommon funding source for many companies engaged in innovation. [Choi et al. \(2016\)](#) show that debt plays an important role in innovative activity by encouraging exploitation. Such studies do not draw a clear direction between innovation and debt in which bank debt can be channeled to already innovative family firms. In this study, we establish that innovation attracts more bank capital. Other studies show that family ownership discourages R&D investments, likely hindering innovation ([Chen and Hsu, 2009](#); [Chin et al., 2009](#); [Chrisman and Patel, 2012](#); [Craig and Moores, 2006](#)). Moreover, firms with high family ownership may increase R&D when the CEO–chair roles are separated or when more independent outsiders are included in the board ([Chen and Hsu, 2009](#)).

Even if extensive literature analyzed the impact of innovation on performance variables, there is no evidence that innovation affects a firm's leverage. In this hypothesis, we investigate whether family firms with stronger innovation activity enjoy higher debt levels; in other words, do firms with more innovation activity attract more debt, or that innovation impedes access to debt?. Thus, the following hypothesis is developed:

H2. There is a positive relationship between a firm's innovation activity and leverage in family firms.

The development of the third hypothesis is challenging and novel since most studies focus on family firm innovations and R&D as outcome variables; whereas, in this study, we focus primarily on financial leverage through bank financing, focusing on the roles of institutional investors and innovations in family firms individually and jointly. First, we begin with the relationship between institutional investors and innovation in family firms. Previous literature finds no conclusive evidence, adopting several theories and frameworks such as agency theory and SEW. Therefore, depending on the context and the framework employed, institutional investors might positively or negatively influence innovation activity in family firms ([Calabrò et al., 2019](#); [Cirillo et al., 2019](#); [Gomez-Mejia et al., 2014](#); [Martí et al., 2013](#)). The same studies suggest moderating factors for the degree of innovation in family firms, such as the role of bank relationships and private equity. Literature also shows a limited understanding of the role of institutional investors in family firms' innovation

(Douma *et al.*, 2006; La Porta *et al.*, 1999). It is also not clear how the motivation and willingness of institutional investors can help family businesses understand the need to innovate (Boh *et al.*, 2020). Since the institutional ownership-family firm innovation nexus is established, and the institutional ownership-capital structure is also established, we go further by merging both relationships, investigating the dynamics of the institutional-family firm innovation relationship in influencing the firm's capital structure. Institutional investors are attracted to companies with growth potential.

Notwithstanding, institutional investors are less inclined to be engaged in family firms to avoid conflicts with family members; they might be interested in family firms with potential growth through innovations. When banks are reluctant to lend to family firms to finance their innovations, they might lend them for the same purpose when institutional investors back family firms. Therefore, we assume indirect relationships between institutional investors, innovation and leverage in family firms. This hypothesis investigates how institutional investors and innovations determine firms' leverage through path analysis. In other words, institutional investors are more inclined to influence leverage when the firm is innovative, or innovation is more important in determining leverage when institutional investors back the firm up. Thus, the following hypothesis is formulated:

H3. Institutional investors and innovation influence leverage through mediation effects.

3. Data and methodological approach

3.1 Data

Data for 700 Italian non-traded family firms were collected from 2010 to 2019, whose ownership belongs to one person or family members with more than 50% of the shares. Their sales revenues are between EUR 5 million and EUR 50 million [1]. Our final dataset is 7,000 firm-year observations. The sample firms belong to three macro sectors, primary (agriculture), secondary (industrial) and third (services), distributed among 20 regions of Italy. Italy represents an interesting context for studying family firms, given the most widespread form of business; more than 780,000 family businesses, making up 85% of companies and contributing to 70% of employment. The Italian context is in line with that of the main European economies such as France (80%), Germany (90%), Spain (83%) and the UK (80%), while the factor that sets Italy apart from these countries is the lesser recourse of family businesses to external managers: 66% of Italian family businesses are fully managed by family members, while this applies to only 26% of French family businesses and just 10% in the UK.

Using AIDA [2] database, we collect the following related data (see also Table 1):

- (1) Dependent variable: This study uses two debt measures: total debt and the total debt ratio. Both measures capture the capital structure dynamics in family firms (Ohman and Yazdanfar, 2017; Pacheco and Tavares, 2015) and (Burgstaller and Wagner, 2015; Fernando *et al.*, 2013; Mc Namara *et al.*, 2017). Debt is considered a funding channel for family firms to finance innovative activities.
- (2) Control Variables: We collect financial indicators (total assets, EBITDA, tangibles and intangibles); these variables are used as proxies for the firm's financial situation extracted from the balance sheet and the income statement. EBITDA is considered an appropriate financial performance indicator. It shows assets' ability to generate earnings distributed to both capital providers and can also be a proxy of operating cash flows. As evidenced in the previous studies, Tangible Assets are considered a direct object as debt collateral when granting new loans. Such variables have been used as control variables in capital structure studies in family firms

(Aybar-Arias *et al.*, 2012; Burgstaller and Wagner, 2015; Degryse *et al.*, 2012; López-Gracia and Sogorb-Mira, 2008; Mc Namara *et al.*, 2017).

(3) Independent variables:

- Institutional investors' existence in family firms represents a proxy for the governance and ownership aspects (Bushee and Noe, 2000; Fernando *et al.*, 2013). It is a binary variable that takes a value of 1 (no institutional investors) and 0 otherwise. Previous literature shows no conclusive sign for the relationship between capital structure and institutional investors' existence, so the sign can be positive or negative. Institutional investors are related to family firms through the agency theory; their existence might improve the monitoring and thus the performance, or they can be a burden to the original family owner creating a type of agency conflict
- Patent value is taken as a proxy for the firm's level of innovation activity (Chin *et al.*, 2009). Again, there is no solid conclusion regarding the role of patents and innovation in attracting debt (changing the capital structure). However, the excessive innovation activity with respect to the firm's dimension would increase the firm's specific risk and impede banks from financing such risky firms. We consider the value of patents as an aggregate proxy for innovation activity without distinguishing between various types of innovations (input, process or output).

(4) Differences among regions and sectors are considered by inserting dummies for the industries and regions to see whether a specific region or sector behaves significantly differently from others.

Financial variables used as independent variables are Assets as a measure of a firm's size. EBITDA is a clean measure of profitability and a proxy of operating cash flow not influenced by the current debt level. Tangibles variable is the value of a firm's physical assets closely evaluated as direct collateral for debt issuance. Intangibles represent the firm's ability to create patents, goodwill, brands and other intangible assets; they can also be viewed as a broad proxy of innovation. The variables appear in two forms: a natural logarithm of the value and the ratio to total assets.

3.2 Theoretical framework

We are aware that no single theory explains the relationship among the variables in our framework. Therefore, we explain such relationships through agency theory, informational asymmetry and institutional theory. We assume that there is a bidirectional relationship among the variables of concern. Leverage is supposed to be influenced by two independent variables, institutional investors and innovation activity. The linkage between institutional investors and leverage is expected to be positive since that institutional investors may be considered a backup for firms' debt or help open new debt channels through banks by enhancing informational efficiency. Concerning the leverage–innovation relationship, positive or negative signs could be obtained; the accumulation of existing innovations can be considered either collateral (positively) or an additional firm-specific risk factor (negatively). In the same context, the two independent variables can also be related in a bidirectional relationship; according to the agency theory, the existence of institutional investors helps firms to be more innovative by adding one external element of control and enabling firms to find innovative solutions, or innovative firms attract institutional investors. In this context, some studies are in favor of the second direction through which institutional investors look for already innovative firms which meet the objectives of institutional

Variable	Symbol	Description
Total debt	DEBT	The log value of the firm's total debt
Leverage	LEV	The ratio of debt to total assets
Patent	INNOV	The Log of patent value, a proxy for innovative activity
Patent to Assets	INNOV_A	The ratio of patent value to total assets, a proxy for innovative activity and risk
Institutional investor	INST	A binary variable for the existence of institutional investors
Total Assets	ASST	The log value of firm's total assets
EBITDA	EBITDA	The log earnings before interest, tax, depreciation and amortization
EBITDA to Assets	EBITDA	The ratio of EBITDA value to total assets
Tangibles	TANG	The log value of the firm's tangibles
Tangibles to Assets	TANG_A	The ratio of tangibles to total assets
Intangibles	INTANG	The log value of the firm's intangibles
Intangibles to Assets	INTANG_A	The ratio of intangibles to total assets
Sector	DUM_{SECTOR}	A dummy variable for the sector
Region	DUM_{REGION}	A dummy variable for the region
$INST \times LOMB$	$INST \times LOMB$	An interaction variable for institutional investors in the Lombardy region
$IND \times LOMB$	$IND \times LOMB$	An interaction variable for the industrial sector in the Lombardy region

Table 1.
Definitions of variables

investors; this is also supported by a recent related study on the relationship between innovation activity and institutional investors in Italy (Harasheh *et al.*, 2018). A firm's financial performance is considered an essential element in determining leverage used as a control variable. Figure 1 shows the theoretical framework.

3.3 Models for panel ANALYSIS

Following Booth *et al.* (2001), we address the hypotheses using the following regression models applied to panel data.

Models (1) and (2) are to test hypothesis one

$$DEBT_{it} = \alpha + \beta_1(INST)_{it} + \beta_2(ASST)_{it} + \beta_3(EBITDA)_{it} + \beta_4(TANG)_{it} + \beta_5(INTANG)_{it} + \beta_6(INST \times LOMB)_{it} + \sum_1^n \gamma_2 D_n + \varepsilon_{it} \quad (1)$$

In model (1), the natural logarithm is used.

$DEBT$ is the value of total debt, $INST$ is a binary variable for the existence of institutional investors in the firm, $ASST$ is the value of the firm's asset; $EBITDA$ is the earnings before

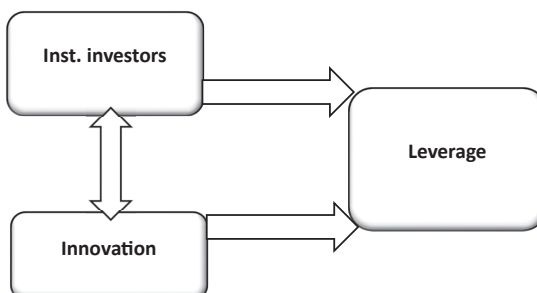


Figure 1.
Theoretical framework

interest, tax, depreciation and amortization; *TANG* is the value of tangible assets; *INTANG* is the value of intangible assets; *INST × LOMB* is an interaction variable for institutional investors in Lombardy region; *D* represents sector and region dummies; and ε is a random disturbance term that is assumed to be uncorrelated across firms or periods.

In [model \(2\)](#), we normalized variables by the value of total assets to use the leverage ratio and eliminate any size bias in the sample regarding the innovation activity. Therefore, innovation activity is considered with reference to total assets.

$$LEV_{it} = \alpha + \beta_1(INST)_{it} + \beta_2(EBITDA_A)_{it} + \beta_3(TANG_A)_{it} + \beta_4(INTANG_A)_{it} + \beta_5(INST \times LOMB)_{it} + \sum_1^n \gamma_2 D_n + \varepsilon_{it} \quad (2)$$

LEV is the firm's leverage which represents the ratio of debt to total assets,

EBITDA_A is a profitability ratio that equals EBITDA/Assets,

TANG_A is the ratio of tangible assets to total assets,

INTANG_A is the ratio of intangible assets to total assets

In [models \(1\) and \(2\)](#), we also added an interaction variable (*INST × LOMB*); this variable allows us to test the relationship between Inst and Debt measures with regard to the existence of institutional investors only in the region of (Lombardy), Lombardy alone captures about one-third of firms and institutional investors in the sample.

[Models \(3\) and \(4\)](#) are to test hypothesis two

$$DEBT_{it} = \alpha + \beta_1(INNOV)_{it} + \beta_2(ASST)_{it} + \beta_3(EBITDA)_{it} + \beta_4(TANG)_{it} + \beta_5(INTANG)_{it} + \beta_6(IND \times LOMB)_{it} + \sum_1^n \gamma_2 D_n + \varepsilon_{it} \quad (3)$$

Like [model \(1\)](#), in [model \(3\)](#), we apply the natural logarithm of all variables, so:

INNOV is the natural logarithm of a firm's innovation activity represented by patent value; *IND × LOMB* is an interaction variable for the industrial sector in the Lombardy region; the definitions of the rest of the variables remain unchanged.

$$LEV_{it} = \alpha + \beta_1(INNOV_A)_{it} + \beta_2(EBITDA_A)_{it} + \beta_3(TANG_A)_{it} + \beta_4(INTANG_A)_{it} + \beta_5(INST \times LOMB)_{it} + \sum_1^n \gamma_2 D_n + \varepsilon_{it} \quad (4)$$

[Model \(4\)](#) is like [model \(2\)](#), in which values are normalized by asset value.

INNOV_A is the ratio of the value of innovation activity (patent value) over total assets, and the definitions of the rest of the variables remain unchanged.

3.4 SEM analysis

The theoretical setup shows that there could be dynamic relationships among the variables of interest with the mediation effect. We chose mediation rather than moderation because the mediators are not exogenous and can be affected by the independent variable. Using path analysis in structural equation modeling is one technique to test such relationships and deal with possible endogeneity issues. Like panel models, we construct the following path models to test the relationship between institutional investors, innovation and the firm's leverage.

- (1) Impact of institutional investors on debt (INNOV as a mediator)
- (2) Impact of institutional investors on debt (EBITDA as a mediator)

- (3) Impact of institutional investors on leverage (INNOV/ASST as a mediator)
- (4) Impact of institutional investors on leverage (EBITDA/ASST as a mediator)
- (5) Impact of patent on debt (INST as a mediator)
- (6) Impact of patent on debt (EBITDA as a mediator)
- (7) Impact of patent-to-asset on leverage (INST as a mediator)
- (8) Impact of patent-to-asset on leverage (EBITDA/ASST as a mediator)

Table 2 presents the descriptive statistics of the variables of interest.

Panel-a reports the monetary values of the selected variables. In terms of CV, EBITDA and Tangibles turn out to be the least risky variable demonstrating how Tangibles are considered plausible collateral from creditors' perspective. So does EBITDA as a broad measure of operating cash flows. However, as a proxy for innovation activity, Patent exhibits the highest variance in terms of CV, which makes it less desirable for debt collateral. On the other hand, Panel-b reports the ratios of all variables to total assets; the average debt ratio is 76%, but in some cases can exceed the value of asset resulting in a negative equity value, patent to assets can reach 42%, which may trigger a risky business activity.

The correlation matrix in Table 3 shows the correlation coefficients among the two panels' variables (values in panel-a and ratios in panel-b). We notice that capital structure measures positively correlate to financial variables and innovation activity. The value of patents has a stronger correlation to debt measures than patents to assets. Financial variables are correlated; however, this does not introduce estimation bias due to multicollinearity since the VIF values are within the accepted threshold of 10 and 2.5 (as a more conservative threshold).

4. Results and discussion

4.1 Panel findings

In both models to test H1, we find no significant relationship between the existence of institutional investors and both debt measures (DEBT and LEV); in this case, Inst do not influence the dynamics of capital structure in family firms; additionally, they seem not to contribute in reducing informational asymmetries surrounding family firms. Consequently, H1 is not accepted, providing no evidence of a relationship between institutional investors and

Variable	OBS	Mean	STD. DEV.	CV	MIN	MAX
<i>Panel-A</i>						
DEBT	7,000	11,640	54,113	4.65	0	1,612,307
ASST	7,000	14,301	63,133	4.41	31,653	2,119,737
EBITDA	7,000	1,198	3,198	2.67	-13,010	88,502
INNOV	7,000	18.4	158	8.59	0	5,230
TANG	7,000	3,494	10,052	2.88	0	172,873
INTANG	7,000	496	2,708	5.46	0	92,386
<i>Panel-B</i>						
LEV	6,991	0.760	7.67	10.09	0	159
EBITDA_A	6,991	0.081	4.64	57.28	-347	44
TANG_A	6,991	0.220	5.38	24.45	0	100
INTANG_A	6,991	0.065	1.63	25.08	0	98
INNOV_A	6,991	0.002	0.01	8.00	0	0.42

Table 2.
Descriptive statistics

Note(s): For Panel A: Means, standard deviations, minimums and maximums are reported in thousands of euros. CV = coefficient of variation

	DEBT	ASST	EBITDA	INNOV	TANG	INTANG	VIF
<i>Panel-A</i>							
DEBT	1						
ASST	0.988*	1					1.48
EBITDA	0.577*	0.589*	1				1.61
INNOV	0.238*	0.210*	0.100*	1			1.36
TANG	0.367*	0.418*	0.584*	0.035*	1		1.51
INTANG	0.552*	0.550*	0.441*	0.119*	0.137*	1	1.28
	LEV	EBITDA_A	PATENT_A	TANG_A	INTANG_A		
<i>Panel-B</i>							
LEV	1						
EBITDA_A	0.91*	1					1.16
INNOV_TA	0.063*	0.091*	1				1.02
TANG_A	0.53*	0.37*	0.11*	1			1.19
INTANG_A	0.27*	0.12*	0.063*	0.19*	1		1.04

Note(s): * $p < 0.05$

Table 3.
Correlation matrix

leverage in family firms. The results are consistent with [Fernando et al. \(2013\)](#), who find that leverage is negatively associated with institutional ownership. Additionally, results could also concur with [Blanco-Mazagatos et al. \(2007\)](#), who provide the debt choice in family firms is not related to the availability of other external equity sources to preserve family control. In this case, agency theory could provide a rationale for such a relationship in which family firms try to avoid institutional investors as much as possible to avoid any potential conflict. However, this might contradict [Badrinath et al., 1996](#); [Skinner, 1989](#)), who show that higher leverage is related to institutional ownership in family firms. Results are presented in [Table 4](#).

In Panels A and B of [Table 4](#), assets and EBITDA are strongly correlated with leverage measures, showing how firm size and profitability are considered substantial factors from the lender's perspective to issue new debt for family firms. These results do not support the Pecking Order Theory since firms with high profitability also ask for external financing through debt. We also find that tangibles and intangibles are significant in explaining family firms' debt levels with no statistical differences in their effect. In contrast, the literature emphasizes the tangible asset's value as a backup for a firm's debt. Dummies for regions and sectors show no statistical differences among different sectors and regions.

It is worth noting that, in both equations of [H1](#), the interaction variable ($INST \times LOMB$) turns out to be significant; this means that in the Lombardy region, institutional investors can have a positive influence on the firm's debt levels by opening new debt channels. Even though the general model shows no significant relationship between Inst and firm's debt, the Lombardy region turns to behave differently; this is because Lombardy represents a substantial and competitive platform for the interaction between firms and institutional investors, about 30% of Inst invest in family firms operating in Lombardy.

In the following table, we present the results of testing [H2](#):

Panel-A concerns the relationship between the value of patent and debt; we find that patent value is a strong determinant for a family firm's debt level, indicating that creditors (banks) consider the value of a family firm's innovation activity when granting the credit, which is consistent with previous literature such as [David et al. \(2008\)](#) and [Ibrahim \(2010\)](#), who find support for the positive relationship between innovation and debt. We also confirm the importance of a firm's financial performance proxies such as Total assets and EBITDA as determinates of a firm's debt level. However, in the presence of innovation activity, the values

Dep. variable: DEBT	Model 1	Model 2	Model 3
<i>Panel A: Debt and institutional investors</i>			
INST	0.002 (-0.24)	0.0017 (-0.19)	0.013 (-1.28)
ASST	0.699 (163)***	0.697 (162)***	0.697 (162)***
EBITDA	0.168 (38)***	0.169 (38)***	0.17 (38)***
TANG	0.012 (4.3)***	0.012 (3.99)***	0.012 (3.9)***
INTANG	0.011 (5.7)***	0.011 (5.5)***	0.011 (5.6)***
DUM_{REGION}	NO	YES	YES
DUM_{SECTOR}	NO	YES	YES
$INST \times LOMB$			0.041 (2.11)**
CONST	1.27 (44.8)***	1.26 (30.2)***	1.26 (30.2)***
R^2	0.922	0.923	0.923
$P > F$	0.000	0.000	0.000
RMSE	0.308	0.306	0.306
N	6,010	6,010	6,010
Dep. variable: LEV	Model 1	Model 2	Model 3
<i>Panel B: Leverage and institutional investors</i>			
INST	0.044 (-0.66)	0.043 (-0.63)	0.095 (-1.18)
EBITDA_A	1.35 (189)***	1.35 (189)***	1.35 (189)***
TANG_A	0.29 (46.2)***	0.29 (46.2)***	0.29 (46.2)***
INTANG_A	0.64 (33.5)***	0.64 (33.5)***	0.64 (33.5)***
DUM_{REGION}	NO	YES	YES
DUM_{SECTOR}	NO	YES	YES
$INST \times LOMB$			0.177 (1.19)*
CONST	0.53 (14.2)***	0.65 (2.65)**	0.62 (2.44)**
R^2	0.888	0.888	0.888
$P > F$	0.000	0.000	0.000
RMSE	2.568	2.566	2.566
N	6,991	6,991	6,991
Note(s): * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$			

Table 4.
DEBT measures and
institutional investors

of tangibles and intangibles become less significant. In the absence of innovations, creditors consider more the value of tangibles and intangibles.

Table 5-Panel B presents the model results in equation (4) that test the relationship between leverage and patent value, where values are normalized by total assets. It shows that the firm's financial characteristics (profitability ratio, tangibility ratio and intangibility ratio) are considered essential factors in determining its leverage in family firms as in nonfamily firms. Interestingly, we find that the variable of concern, "Patent /Asset," is negatively correlated to the family firm's leverage which contradicts the positive relationship between (patent value) and (debt value) in the previous test. This would mean that the importance of innovation value diminishes as its value to total assets grows. This finding is consistent with the corporate risk theory in which firm-specific risk increases as the firm's operations mainly depend on high-risk activities such as patenting and innovations; in such cases, family firms tend to finance their risky activities either internally (EBITDA) or by looking for venture capitalists who have a higher tolerance for firm-specific risk. These findings are not uncommon, consistent with Hall and Lerner (2010), Lööf (2009) and O'Brien (2003), who conclude that excessive innovation might be considered a firm-specific risk and that debt is not appropriate for financing innovations.

Additionally, our findings are consistent with Chen and Hsu (2009), Chin *et al.* (2009), Chrisman and Patel (2012) and Craig and Moores (2006), who provide that family ownership discourages R&D investment hence hindering innovations. Finally, according to the agency

Dep. variable: DEBT	Model 1	Model 2	Model 3
<i>Panel A: Debt and innovation</i>			
INNOV	0.022 (4.64)***	0.021 (4.76)***	0.021 (4.78)***
ASST	0.669 (85.6)***	0.663 (83.4)***	0.663 (83.37)***
EBITDA	0.186 (23.14)***	0.182 (22.62)***	0.182 (22.57)***
TANG	0.007–1.27	0.012 (2.18)**	0.012 (2.24)**
INTANG	0.003–0.67	0.004–0.92	0.004–0.9
<i>DUM_{REGION}</i>	NO	YES	YES
<i>DUM_{SECTOR}</i>	NO	YES	YES
<i>IND × LOMB</i>			0.032 (0.93)*
CONST	1.54 (24.16)***	1.45 (15.71)***	1.44 (15.49)***
<i>R</i> ²	0.893	0.898	0.898
<i>P > F</i>	0.000	0.000	0.000
<i>RMSE</i>	0.319	0.313	0.313
<i>N</i>	1,826	1,826	1,826
Dep. variable: LEV	Model 1	Model 2	Model 3
<i>Panel B: Leverage and innovation</i>			
INNOV_A	−26.32 (−10.26)***	−26.34 (−10.23)***	−26.34 (−10.24)***
EBITDA_A	1.36 (191)***	1.36 (191)***	1.36 (191)***
TANG_A	0.29 (47.2)***	0.29 (47.2)***	0.29 (47.2)***
INTANG_A	0.65 (34.1)***	0.65 (34.2)***	0.65 (34.2)***
<i>DUM_{REGION}</i>	NO	YES	YES
<i>DUM_{SECTOR}</i>	NO	YES	YES
<i>IND × LOMB</i>			−0.124 (−0.9)
CONST	0.58 (18.8)***	0.69 (2.82)***	0.73 (2.91)***
<i>R</i> ²	0.889	0.890	0.890
<i>P > F</i>	0.000	0.000	0.000
<i>RMSE</i>	2.549	2.547	2.547
<i>N</i>	6,991	6,991	6,991
Note(s): * <i>p</i> < 0.1; ** <i>p</i> < 0.05; *** <i>p</i> < 0.01			

Table 5.
DEBT measures and
innovation activity

approach, debt can act as a disciplinary mechanism. Still, the extent of the relationship between debt and innovation depends on the monitoring mechanisms by debt providers. In this regard, H2 is supported. There is a relationship between a family firm's innovation activity and its capital structure. The direction of the relationship and the extent depend on the intensity of innovation activity.

4.1.1 Robustness test [3]. In this context, we assume that innovation attracts firms' debt, which is considered a guarantee side. However, when a firm's innovation activity reaches a certain level (high level) with respect to the general firm's activity, it becomes a specific risk factor from the banks' perspective. We test this argument by running a nonlinear regression of patent activity against debt measures; we find that the relationship between patent activity and debt level is strongly positive but up to a certain level in innovation activity. This shows an optimal level of a firm's innovation activity to be considered collateral for creditors. However, uncertainty regarding the firm's operations starts to emerge when the level of innovation activity starts to count high.

4.2 Path analysis

Path analysis allows for studying the impact of independent variables (institutional investors and patents) on the leverage variables using the mediation effect. In sections A and B of Table 6, we show the relationship between institutional investors and (debt and leverage) with patent and EBITDA as mediators (separate models are applied). Both mediators are

EMJB

A	DEBT	DEBT
INST	-3,787	-4,005
INNOV	80.89	0.000
EBITDA	0.000	9.76
<i>TOT. EFF.</i>	-5,128	0.000
R^2	0.000	0.000
N	7,000	7,000
B	LEV	LEV
INST	-0.05	0.06
INNOV_A	40.56	0.47
EBITDA_A	0.000	1.51
<i>TOT. EFF.</i>	-0.08	0.000
R^2	0.674	0.67
N	0.001	0.000
	6,991	6,991
C	DEBT	DEBT
INNOV	80.89	62.3
INST	-3,787	0.000
EBITDA	0.005	9.46
<i>TOT. EFF.</i>	81.43	0.000
R^2	0.000	81.4
N	0.06	0.000
	7,000	0.06
		7,000
D	LEV	LEV
INNOV_A	40.46	-12.2
INST	-0.05	0.000
EBITDA_A	0.79	1.51
<i>TOT. EFF.</i>	40.52	0.000
R^2	0.000	40.52
N	0.005	0.000
	6,991	0.01
		6,991

Note(s): A: institutional investors on debt, mediation patent and EBITDA separately

B: institutional investors on leverage, mediation patent and EBITDA separately

C: patent on debt, mediation INST and EBITDA separately

D: (patent/asset) on debt, mediation INST and EBITDA/asset separately

Table 6.

Path analysis results

positively related to debt measures, while INST is negatively related to debt directly, through patent mediation, and the total effect. As shown in panel analysis, results might indicate that institutional investors' existence does not help family firms to change their capital structure through new debt issuance.

On the other side, sections C and D present the path models of innovation variables on debt measures with institutional investors and EBITDA (separately) as mediators. In section C, the patent is strongly related to debt in a direct path and through both mediators. However, in section D, the ratio of patents to assets is negatively related to leverage in EBITDA as a mediator. In contrast, it is positively associated with leverage in the presence of institutional investor's variable as a mediator. In conclusion, the path analysis supports the panel findings providing further insights into how the different paths might affect the family firms' capital structure. [Figure 2](#) demonstrates the path analysis for the eight models presented earlier; arrows show the direct effects' coefficients, whereas the total effect is shown in [Table 6](#).

5. Conclusions and implications

Firms continuously look for new value-creation opportunities; family firms are no exception. Given the role of leverage in value creation, family firms try to optimize their debt levels as a source of external financing and a value creation tool. Most previous studies focus on family firm innovations and R&D as outcome variables. In contrast, a few studies focus on financial leverage factors in family firms. Therefore, in this study, we study primarily on financial leverage through bank financing, focusing on the roles of institutional investors and innovations in family firms individually and jointly. The role of institutional investors in a firm's capital structure and innovation is well-investigated with no conclusive evidence adopting several theories and frameworks such as agency theory and SEW. Therefore, we go further by merging both relationships, investigating the dynamics of the institutional-family firm innovation relationship in influencing the firm's capital structure. Institutional investors are attracted to companies with growth potential. In particular, we study the role of two factors in the firm's leverage, a classical one (institutional investor) and a non-classical factor (innovation activity), filling the current gap in the literature in establishing a framework connecting the three variables of concern. We study whether institutional investors help family firms open new debt channels since institutional investors back them up.

Independently, we also examine the role of a family firm's innovation activity on leverage. We test whether more innovative family firms attract more debt and the interaction between variables in determining capital structure jointly through path analysis. We study a large sample of 700 family firms in Italy from 2010 to 2019 using panel regressions, path analysis and the nonlinearity test. The results show that institutional investors' variable has no relationship with leverage measures except when we control for an interaction variable ($INST \times LOMB$); suggesting that institutional investors do not help family firms in establishing new debt channels except for Lombardy region, which is considered the biggest platform for innovation, banks and institutional investors. The value of patents is positively correlated with debt; this shows that a firm's patent activity can be used to guarantee new bank loans. However, the ratio of patents to assets is negatively related to the firm's leverage, suggesting that innovation could be a double-edged tool. This finding is consistent with the risk-return trade-off; when the level of innovation activity exceeds a certain point relative to the firm's overall activity, banks consider it an idiosyncratic risky activity. Therefore, creditors either increase the cost of financing or refuse to grant new debt.

Moreover, the nonlinearity test demonstrates a turning point at which the relationship between patent value and capital structure inverts; this confirms the above argument on risky activity. Financial variables such as EBITDA, Tangibles and Intangibles explain the

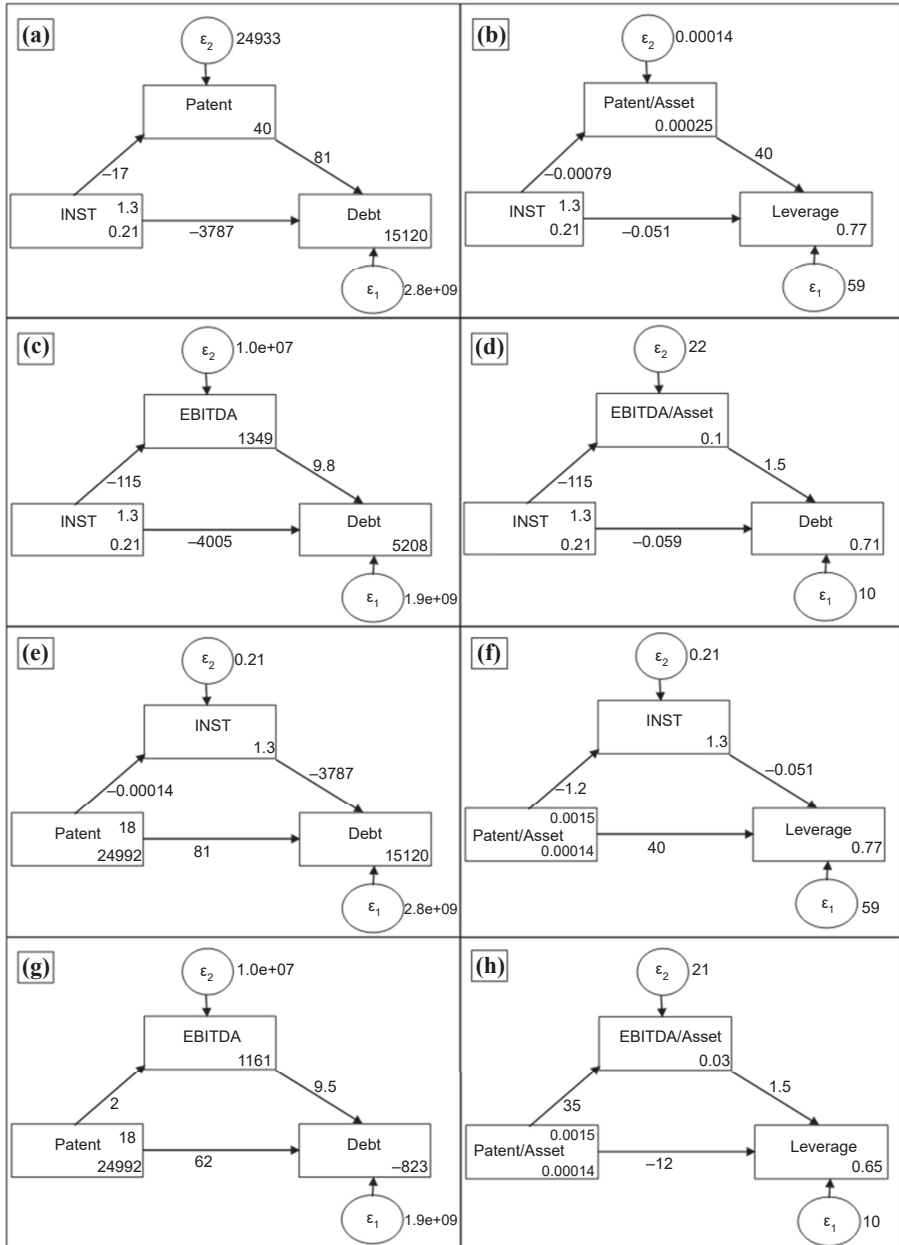


Figure 2. Path analysis

family firm's capital structure, which shows less consistency with the pecking order theory for internal financing preferences. The path analysis confirms the panel findings; we provide more details on possible paths on how each independent variable affects debt variables.

Implications: This research provides practical implications for different players in the market. At the firm's level, institutional investors do not seem to enhance firms negotiating new debt, and they just exploit existing opportunities. Furthermore, since innovation activity is a driver for financial leverage, creating a national platform showing all family and small businesses' innovation activity would enhance visibility and improve the informational efficiency of the market and improve the decision-making by fund providers. Furthermore, firms should watch out for their involvement in innovation activities since excessive activity increases risk exposure, fewer financing opportunities and ultimately affects value creation.

Limitations: This research is not limitation-free; we focus only on Italy, which might affect the generalizability of the findings. We consider the value of patents as an aggregate proxy for innovation activity without distinguishing between various types of innovations (input, process or output). Other measures could also be considered to provide a more comprehensive view of the relationship in question. Moreover, we mainly focus on bank debt without distinguishing additional capital raising channels for family firms and without concentrating on certain case studies to provide more profound insights into the family firm-bank relationship. Such limitations leave space for further and future investigations to answer unsolved issues.

Notes

1. The decision of the revenue range is based on the EU definition of the SME according to the directive 34/2013/EU, which corresponds to the article (Art. 2435-bis c.c.) of the Italian civil code.
2. AIDA (Analisi Informatizzata delle Aziende Italiane) – Bureau Van Dijk. (Update 287 – Software Version 103.00 Data Update 23/12/2020 (n° 28704))
3. Results of this test are omitted for space reasons, but they are available upon request.

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