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Determinants of Debt Financing Behavior of Unlisted Moroccan Family SMEs: A Panel Data Analysis

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Abstract: This paper investigates the firm-level determinants of debt policy in private family SMEs. It employs a comparative analysis of two sub-samples of family and non-family SMEs using panel data from 200 Moroccan SMEs over the period from 2018 to 2022. The findings reveal that family SMEs adopt a conservative financing strategy, maintaining lower debt levels compared to their non-family counterparts. This conservative approach appears to be driven by risk considerations related to bankruptcy costs associated with higher debt levels. Indeed, the results show that the financing behaviors of family SMEs align more closely with pecking order theory than trade-off theory. Furthermore, the study suggests that the financing behavior of family SMEs differs slightly from that of non-family SMEs, but this difference is not resistant to changes in debt measures. This study makes several contributions to the literature. First, it identifies the key determinants of debt policy among family SMEs, offering insights into the distinctive financing strategies employed by these firms. Second, it offers evidence supporting the relevance of capital structure theories in explaining the financing decisions of family firms within the context of developing economies. In addition, the study's findings have practical implications insofar as they can guide policymakers and banking stakeholders, especially those in bank-based economies where debt is the primary financing option for SMEs, in conceiving adapted financing options that align with the characteristics of family firms, thereby fostering their growth and, consequently, the economy's development.

Keywords: debt financing; family SMEs; panel data; Morocco

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1. Introduction

Family firms are the most prevalent form of organization worldwide (Harasheh et al., 2024; Yilmaz et al., 2024). During the last decade, family firms have received increased interest, and researchers have investigated different aspects and practices of them, such as corporate governance (Arteaga & Escribá-Esteve, 2021; Koji et al., 2020; Umans et al., 2020), performance (Ghalke et al., 2023; Jarchow et al., 2023; San Martin-Reyna & Duran-Encalada, 2015), internationalization (Miroshnychenko et al., 2023), and corporate finance (Jansen et al., 2023; Tran & Nguyen, 2023), and adopted multiple frameworks, such as socioemotional wealth (SEW) (Bauweraerts et al., 2024; Blanco-Mazagatos et al., 2024; Boumlik et al., 2024), agency theory (Rahman et al., 2023), and trade-off and pecking order theories (Bauweraerts & Colot, 2012). Nonetheless, significant challenges and research gaps persist in this research field (Harasheh et al., 2024), and there is a growing call among scholars for additional research on family firms, particularly with regard to financing policy

(Michiels & Molly, 2017). Indeed, questions related to the capital structures of family firms may seem well-explored. However, a deep examination of the literature reveals that most research has focused on large corporations and publicly listed firms (Baixauli-Soler et al., 2021; Molly et al., 2019). This emphasis leaves a significant gap in knowledge about the financing behavior of family SMEs (Burgstaller & Wagner, 2015). Family SMEs display distinct characteristics compared to larger firms (Baixauli-Soler et al., 2021; Burgstaller & Wagner, 2015), with substantial differences observed not only between SMEs and large firms but also between listed and unlisted family SMEs (Burgstaller & Wagner, 2015). Thus, research on financing decisions must consider the specificities of family SMEs and their environments.

It is true that research on the capital structures of family SMEs has developed over the last years, especially with the works of Burgstaller and Wagner (2015), Molly et al. (2010), Molly et al. (2012), and Baixauli-Soler et al. (2021). Nevertheless, it is primarily Western-based and provides conflicting results, leaving gaps in the literature on this topic. Indeed, Michiels and Molly (2017) affirm that most research on the financing behavior of family businesses has been conducted in Europe, North America, and Asia, while studies in Africa, South America, and Australia are rare. Therefore, our knowledge of financing practices is primarily derived from models and theories that were conceived within Western contexts. These frameworks in corporate finance research are mainly based on assumptions that align more closely with developed markets, making their applicability to developing economies questionable (Baker & Jabbouri, 2016; Bekaert & Harvey, 2002). This discrepancy is particularly evident given the limited empirical research available to validate these theories in emerging and developing economies. The issue is even more pronounced in the context of family SMEs, as little research has been conducted on the corporate finance practices of family SMEs in Arab contexts. These challenges further cast doubt on the applicability of traditional capital structure theories in explaining their financing decisions. As a result, direct extrapolations from capital structure findings in developed countries to those in developing economies cannot be justified.

This study contributes to this field by analyzing the financing behavior of Moroccan family SMEs and identifying key determinants shaping their capital structures. Specifically, this paper aims to address the following research questions:

1. What are the key determinants of the debt financing behavior of Moroccan family SMEs?
2. Is the debt financing behavior of family SMEs different from that of their non-family counterparts?
3. Which classical capital structure theory is relevant for explaining the financing behavior of Moroccan family SMEs?

In Morocco, very small, small, and medium-sized enterprises dominate the economic landscape, accounting for 99% of companies according to the latest official data from the Moroccan SME Observatory (OMTPME, 2024). Most of these SMEs are family-owned (Minialai, 2013). Moreover, due to their significant weight in the national economy, family businesses are often synonymous with SMEs in the Moroccan context (Minialai, 2013). Despite their prevalence, Moroccan family SMEs are significantly under-researched, primarily due to the scarcity of both theoretical and empirical studies on the topic (Karim, 2016). As a result, most existing literature offers only general insights, lacking detailed or in-depth analyses. This gap underscores the importance of conducting the present research to address this specific context comprehensively.

This paper makes several significant contributions to the literature. First, it advances our understanding of corporate finance practices in family firms by identifying key factors influencing their financing decision-making, thereby contributing to the ongoing debate

about family firms' capital structure. Specifically, it sheds new light on the financing logic of SMEs and adds to the discourse on the distinctiveness of debt financing behaviors in small firms.

Moreover, the study provides valuable evidence from an emerging market, thereby contributing to the international discussion on the debt policies of family firms, as limited research has been focused on this topic in emerging and developing economies. Furthermore, it examines the applicability of traditional capital structure theories in the context of family SMEs.

Additionally, the study's findings have practical implications insofar as they can guide policymakers and banking stakeholders, especially those in bank-based economies where debt is the primary financing option for SMEs, in conceiving adapted financing options that align with the unique characteristics of family firms, thereby fostering their growth and, consequently, the economy's development.

The remainder of the paper is structured as follows: Section 2 outlines the theoretical background, Section 3 presents the related works and hypothesis development, Section 4 describes the data collection process and methodology, Section 5 presents the findings, Section 6 presents a discussion, and a general conclusion is presented in Section 7.

2. Theoretical Background

2.1. Overview of Capital Structure Theories

Capital structure theory development started with the initial work of Modigliani and Miller (1958), who suggested that capital structure is not relevant to a firm's value and that a company can be fully financed by debt or equity. These propositions are based on unrealistic assumptions, such as the absence of taxes and transaction costs. A few years later, Modigliani and Miller (1963) revisited their theory and considered the existence of taxes in their framework that time. Therefore, they suggested that the capital structure does have an effect on the firm's value. Specifically, the authors assumed that the value of an indebted firm is higher than that of a non-indebted one because of the tax shield. The theoretical proposition by Modigliani and Miller (1963) regarding the tax advantage of debt leads to the following question: If increasing the debt level maximizes the firm's value, why do companies not maximize their debt level? The answer is that excessive debt financing is associated with increased bankruptcy costs. Therefore, companies determine their optimal financial structure by considering the tax benefits related to debt against the potential bankruptcy costs associated with it. In this regard, the trade-off theory (TOT) states that firms have a target capital structure ratio that is optimal for maximizing its value. Indeed, companies try to reach their target debt level either by issuing bonds if they are under-leveraged or by using more internal funds if they are over-leveraged (Bauweraerts & Colot, 2012; Colot & Croquet, 2007b). By taking this into consideration and assuming that the propositions of trade-off theory are correct, every firm should normally be at its optimal leverage ratio. Nonetheless, achieving an optimal target ratio requires a change in the capital structure, which in turn gives rise to adjustment costs (Myers, 1984). Indeed, companies cannot quickly switch their capital structure, as this entails considerable costs. For instance, if a company decides to reduce its level of debt, it must repay its debts ahead of schedule, which will incur important costs. Hence, adjustment costs slow down the achievement of a target debt-to-equity ratio. While pursuing the target ratio, companies are not, logically, at their optimal capital structure. This gives rise to what Myers (1984) calls "cross-sectional dispersion", which refers to the situation where companies have the same target debt ratio but different real capital structures. These differences are the costs and adjustment time specific to each company.

Furthermore, considering agency costs is critical for the understanding of capital structure decisions (Jensen & Meckling, 1976). According to Jensen and Meckling (1976), managers are likely to act in their own self-interest by using available resources for personal gain since they receive only a small fraction of the company's profits, whereas they incur costs when they do not invest in their own interests. This principal–agent conflict can be attenuated by giving managers a stake in the company's capital, thus aligning their interests with those of the shareholders. According to Jensen (1986), debt financing leads to cash outflows to creditors, reducing the available liquidity that managers can leverage to their benefit. Additionally, it exposes them to financial market supervision when the firm seeks further external financing. In this way, indebtedness appears to be a mechanism that mitigates principal–agent conflicts and maximizes firm value. Nonetheless, debt financing gives rise to new agency costs relating to the relationship between creditors and owners. Indeed, owners tend to prefer to finance risky investments through debt. This will bring them substantial profits in the event of success, whereas their loss is limited if the project fails, unlike creditors (Chakraborty, 2010). Nevertheless, if creditors anticipate this, they will consider a high premium in the credit contract, which will result in an increased cost of debt. Thus, agency theory states that companies must determine their optimal capital structure by making a trade-off between the agency costs of equity and those of the relationship with creditors (cost of debt) (Chakraborty, 2010).

In addition to the aforementioned determinants, the pecking order theory (POT) of capital structure enhances the comprehension of decisions regarding financing policy by considering other relevant factors that affect financing decisions. First, POT suggests that companies' financing choices follow an order of preference favoring internal financing in the first place, and when internal resources are insufficient, debt financing is the preferred option, followed by external equity (Chalençon & Marion, 2021). The criteria determining this order of preference are costs related to information asymmetry, adverse selection risk (Chalençon & Marion, 2021) and transaction costs (Chen & Chen, 2011; Vasiliou et al., 2009). In fact, the use of internal financing has no transaction costs and presents minimal information asymmetry costs, which makes it preferable to external resources. On the other hand, recourse to external financing often entails significant transaction costs, notably related to external equity (Emery & Finnerty, 1997, cited in (Vasiliou et al., 2009)).

Pecking order theory (POT) is particularly relevant in the context of small- and medium-sized enterprises (SMEs) due to their specific objectives, which prioritize maximizing value without compromising control or independence rather than achieving an optimal capital structure ratio (Ang, 1991). Indeed, SME owners, who are often also the managers, prefer internal resources to maintain control over their businesses. If external financing is required, they tend to favor short-term debt as it imposes fewer constraints on management and avoids the guarantees or contracts often associated with long-term financing (Holmes & Kent, 1991). This hierarchy highlights key differences between the capital structures of SMEs and large firms. According to Scherr et al. (1993), agency costs and information asymmetry, which characterize the relationship between managers and external capital providers, are more significant in small- and medium-sized enterprises (SMEs) than in large firms. Consequently, the disparity in the costs associated with external financing options becomes more pronounced. Therefore, the principles of the pecking order theory are better suited to the context of SMEs than to that of large firms.

2.2. Capital Structure Theory Validity in Family Firm Contexts

2.2.1. POT and Family Firms' Capital Structures

Previous research suggests that family business financing behavior is likely to align with the pecking order theory, prioritizing internal funds over external financing, and,

when internal resources are insufficient, debt becomes the preferred option (Michiels & Molly, 2017; Poutziouris, 2001). For instance, Oktavina et al. (2018) found that Indonesian industrial family firms adhere to this model, relying on profits to finance investments while minimizing debt usage. Similarly, López-Gracia and Sánchez-Andújar (2007) observed that small family firms prefer internal financing to preserve control, even at the expense of growth opportunities. Empirical evidence by Jansen et al. (2023), based on 277 family businesses, confirms adherence to the pecking order theory framework. Their findings indicate a preference hierarchy: internal funds, debt, family equity, and, lastly, external equity motivated by economic and non-economic factors, such as control preservation and continuity concerns. Colot and Croquet (2007a) found that Belgian family firms, compared to non-family firms, are more indebted due to their aversion to control dilution, thereby confirming the hierarchical order of the pecking order theory. In contrast, Bauweraerts and Colot (2012), after analyzing 210 Belgian private firms, argued that family businesses target an optimal debt ratio, which is consistent with the trade-off theory rather than the pecking order hierarchy.

While many studies support the pecking order theory (Blanco-Mazagatos et al., 2010; Burgstaller & Wagner, 2015; Jansen et al., 2023), others align with the trade-off theory (Bauweraerts & Colot, 2012) or find no evidence supporting the pecking order model (Anderson & Reeb, 2003). These inconsistencies highlight the complexity of family business capital structure decisions, suggesting that while the pecking order theory offers valuable insights, its applicability is context-dependent and cannot be universally generalized.

2.2.2. TOT and Family Firms' Capital Structures

The trade-off theory posits that firms target an optimal debt level that maximizes their value. Companies attempt to reach this target by issuing debt when under-leveraged or by relying more on internal financing when over-leveraged (Bauweraerts & Colot, 2012; Colot & Croquet, 2007a). The trade-off theory has been extensively applied to studies on the capital structures of family businesses. For instance, Bauweraerts and Colot (2012), in their study of 210 large firms in Belgium, found that family businesses pursue a target debt ratio, continuously minimizing their debt levels to reduce bankruptcy risk and associated costs, suggesting that family businesses tend to align with the trade-off theory. In the same vein, Saleh et al. (2018) analyzed the validity of trade-off theory and pecking order theory in explaining the financing behaviors of government-owned, manager-owned, foreign-owned, and family firms in Malaysia. Using data from 407 firms between 2012 and 2015, the study concluded that the trade-off theory effectively explains the financial decisions of family and manager-owned firms, while the pecking order theory better captures the behavior of government-owned and foreign-owned companies.

Moreover, Serrasqueiro et al. (2016) affirmed that family firms' adherence to the trade-off theory depends on their age and size. Specifically, older and larger family firms are more likely to exhibit debt behaviors consistent with the trade-off theory.

2.2.3. Agency Cost Theory and Family Firms' Capital Structures

Agency costs related to debt are often associated with risk transfer issues. Specifically, conflicts between shareholders and bondholders arise from the former extracting wealth from creditors by engaging in riskier investments compared to the firm's current projects. Hence, shareholders capture all the gains from such investments, while bondholders bear significant risks and associated costs (Chakraborty, 2010). Agency conflicts between shareholders, managers, and bondholders take on a unique dimension in family businesses. These firms often pursue non-economic objectives, such as family harmony and long-term sustainability, which give rise to distinctive agency issues compared to non-family firms.

Indeed, agency theory posits that family owners, as majority shareholders, closely monitor managerial behavior, reducing principal–agent agency costs. Therefore, family ownership can substitute for debt as a governance mechanism to curtail the managerial pursuit of personal interests. Furthermore, Mishra and McConaughy (1999) argue that family managers are reluctant to rely on debt due to the risk of financial distress and the associated bankruptcy costs. Nevertheless, the presence of a controlling family in a firm reshapes agency conflicts between owners and bondholders (Ma et al., 2017). Concentrated ownership and control by family shareholders can lead to either reduced or heightened agency costs, depending on whether the family's motivations align with or diverge from the interests of creditors. This duality influences the cost of debt, as family control may either mitigate or exacerbate risk.

Empirical evidence on the effect of family ownership on debt costs is limited and yields conflicting results. For instance, Anderson et al. (2003) found that U.S. family firms generally benefit from lower debt costs due to their long-term vision, reputation, and commitment to sustaining businesses across generations, which align with creditor interests. Similarly, studies in Malaysia, Thailand, and Canada (e.g., Saleh et al. (2018); Swanpitak et al. (2020); and Gill et al. (2022)) indicate that family firms often enjoy reduced debt costs and increased access to financing, which is attributed to their focus on reputation, relational capital, and reduced information asymmetry.

Conversely, other studies highlight the potential negative effects of family control on debt conditions. Research in China (e.g., Gao et al. (2020) and Pan and Tian (2016)) and transnational studies (e.g., Boubakri & Ghouma, 2010) show that family firms may face higher debt costs due to the perceived risks of wealth expropriation, limited financial transparency, and increased credit risk. For example, creditors may demand higher collateral or impose larger bond spreads on family firms, particularly in environments with weak investor protections.

The mixed findings suggest that the impact of family ownership on the cost of debt is highly context-dependent, influenced by factors such as institutional frameworks, cultural norms, and the extent of financial opacity. While family ownership can align interests with creditors in some settings, it can also amplify agency conflicts and financial risks in others, resulting in divergent effects on debt costs.

3. Literature Review and Hypothesis Development

The capital structures of family SMEs are shaped by multiple economic and rational factors, with their debt behaviors theoretically being grounded in frameworks such as the pecking order theory, trade-off theory, agency theory, and signaling theory. These theories suggest that variables relating to information asymmetry (e.g., pecking order theory, signaling theory, and agency theory) and bankruptcy costs (e.g., trade-off theory) influence firms' debt levels. Although these theories often identify the same determinants, they may diverge in terms of their effect direction (positive or negative). We expose in the following points the research hypothesis we derived from our theoretical framework.

3.1. Profitability and Debt Financing

The theoretical prediction of profitability's impact on debt levels is conflicting. According to Myers and Majluf (1984), profitability negatively influences debt, as firms prefer using internal funds over external financing, aligning with the pecking order theory. Conversely, the static trade-off theory suggests that profitable firms are more likely to increase debt to capitalize on tax benefits from interest deductibility, indicating a positive association between profitability and debt (Chakraborty, 2010). Profitability is thus a critical factor in

testing the validity of competing theories, such as the pecking order and trade-off theories (Burgstaller & Wagner, 2015).

Empirical studies on family SMEs predominantly support a negative relationship between profitability and debt, validating the pecking order theory. Research across various contexts (e.g., Austria, Belgium, Spain, and Portugal) consistently shows that profitable family SMEs rely more on internal funds, reducing their debt levels (Burgstaller & Wagner, 2015; López-Gracia & Sánchez-Andújar, 2007; Molly et al., 2019; Pacheco, 2022). For instance, Molly et al. (2012) and Molly et al. (2019) demonstrate a negative and significant association between profitability and total, short-term, and financial debt for family SMEs in Belgium. Similar findings have been reported in Spain and Portugal, where profitability leads to decreased reliance on external debt (López-Delgado & Diéguez-Soto, 2020; Ntoung et al., 2019). Indeed, empirical evidence tends to converge on the notion that higher profitability in family SMEs reduces debt reliance, as profitability enhances the capacity for internal financing. This finding aligns with the pecking order theory and the risk-aversion perspective of debt financing among family SMEs, as they tend to avoid debt due to its association with higher bankruptcy costs. Based on this, the following hypothesis is proposed:

H1. *Profitability negatively affects the debt levels of Moroccan family SMEs.*

3.2. Liquidity and Debt Financing

Liquidity represents the resources a company retains after meeting its obligations and expenses, with a positive value indicating a liquidity surplus (Mansourlakoraj & Sepasi, 2015). The pecking order theory predicts a negative relationship between liquidity and debt, as firms prefer internal resources due to informational asymmetry costs associated with external financing options. Empirical studies often support the pecking order theory in the context of family SMEs. Research indicates a consistent negative relationship between liquidity and debt (Comino-Jurado et al., 2021; Lardon et al., 2017; Pacheco, 2022). For instance, Lardon et al. (2017) revealed robust evidence in Belgian family SMEs, where liquidity negatively impacts all debt measures, reinforcing the relevance of the pecking order theory. These findings are consistent with Baixauli-Soler et al. (2021), who demonstrated that cash holdings negatively influence financial and non-financial debt levels in family SMEs.

Based on the above evidence and the theoretical framework of the pecking order theory, we propose the following hypothesis:

H2. *Liquidity negatively affects the debt levels of Moroccan family SMEs.*

3.3. Growth Opportunities and Debt Financing

Capital structure decisions are influenced by the presence of growth opportunities. According to pecking order theory, firms with significant growth opportunities are often unable to generate sufficient profits to internally finance large-scale expansion. Consequently, these firms are compelled to seek external financing, with debt being the preferred option due to its lower cost relative to equity (Acedo-Ramirez et al., 2017; Chakraborty, 2010; López-Gracia & Sánchez-Andújar, 2007). In support of this, Molly et al. (2010) found a positive association between growth and debt in Belgian family SMEs, suggesting that growth opportunities encourage family SMEs to increase borrowing to capitalize on these opportunities. Acedo-Ramirez et al. (2017), using data from Spanish family firms, found that growth opportunities are negatively associated with debt levels in small family firms, whereas they are positively associated with debt financing among large firms, suggesting that the relationship between growth opportunities and debt is contingent to firm size.

In line with the pecking order theory, we hypothesize that family SMEs will increase their debt levels to seize growth opportunities:

H3. *Growth opportunities positively affect the debt levels of Moroccan family SMEs.*

3.4. Asset Tangibility and Debt Financing

Most capital structure theories suggest that the type of asset held by a firm significantly influences its financial structure (Titman & Wessels, 1988). Asset tangibility, a critical factor in capital structure research, is closely linked to the agency costs of debt and financial distress costs (Booth et al., 2001). Indeed, tangible assets can reduce informational asymmetry by serving as collateral, which lowers creditors' risk and the cost of capital (Myers & Majluf, 1984; Santos et al., 2014). Thus, firms with higher tangibility are more likely to issue secured debt, leveraging the value of tangible assets to minimize the agency and financing costs of debt.

Empirical evidence predominantly supports a positive relationship between asset tangibility and leverage. Studies across various contexts indicate that tangibility positively influences total and long-term debt levels in family SMEs, as tangible assets provide greater capacity to secure debt (Lardon et al., 2017; Molly et al., 2012; Schmid, 2013). However, while tangibility typically shows a positive correlation with long-term debt, it may negatively affect short-term debt due to mismatches between debt maturity and asset duration (Comino-Jurado et al., 2021; Molly et al., 2010).

Overall, the prevailing view is that asset structure significantly affects capital structure decisions, particularly in family SMEs, by mitigating agency conflicts and reducing information asymmetry between managers, owners, and creditors. Based on these insights, we propose the following hypothesis:

H4. *Asset tangibility positively influences the debt levels of Moroccan family SMEs.*

3.5. Non-Debt Tax Shield and Debt Financing

The trade-off theory suggests that firms benefit from leveraging debt to take advantage of the tax benefits associated with interest deductibility (Burgstaller & Wagner, 2015). This tax shield reduces the firm's tax liability, making debt an attractive option for capital structuring. Nevertheless, DeAngelo and Masulis (1980) assert that firms will decrease their use of debt in the capital structure when alternative tax-reducing mechanisms, such as non-debt tax shields, are available. Indeed, debt is not the only way to capitalize on tax advantages. Other alternatives, such as depreciation, which is also tax-deductible, can serve as substitutes for the tax benefits of debt. These non-debt tax shields enable firms to reduce their tax burden without incurring the financial distress risks associated with higher leverage (López-Gracia & Sánchez-Andújar, 2007).

Therefore, the presence of non-debt tax shields may diminish managers' incentive to use debt (Acedo-Ramirez et al., 2017). In support of this, López-Gracia and Sánchez-Andújar (2007), in their study of small Spanish family businesses, found that non-debt tax shields negatively influence overall debt levels. This suggests that small family businesses leverage these tax advantages as substitutes for debt to reduce tax pressure while avoiding financial risk. In the same vein, Acedo-Ramirez et al. (2017) reported that non-debt tax shields are inversely associated with debt levels in small private Spanish family firms, although this relationship is not significant for medium or large family firms in their sample.

Overall, previous empirical studies tend to support a negative association between non-debt tax shield and debt financing. Therefore, the following hypothesis is formulated:

H5. *Non-debt tax shields negatively influence the debt levels of Moroccan family SMEs.*

3.6. Firm Size and Debt Financing

Firm size is a widely studied variable in corporate finance research, relevantly considered as a key determinant of capital structure, although it is rarely discussed in depth. Indeed, larger firms tend to be more diversified, have easier access to financial markets, and face lower bankruptcy risks, enabling them to borrow under more favorable conditions (Burgstaller & Wagner, 2015). According to agency theory, larger firms experience fewer informational asymmetries and reduced agency conflicts with creditors, supporting a positive relationship between size and leverage (Jensen & Meckling, 1976).

Empirical evidence largely supports a positive association between firm size and debt financing. In this line, the study by Molly et al. (2010) reveals that firm size has a positive effect on the debt financing of Belgian family SMEs. Similar results were reported by Pacheco (2022), who found a positive relationship between firm size and leverage in Portuguese family SMEs, suggesting that larger firms prefer debt financing.

In line with the pecking order theory, we propose the following hypothesis:

H6. *Firm size positively influences the debt levels of Moroccan family SMEs.*

3.7. Firm Age and Debt Financing

The literature suggests that capital structure is influenced, to some extent, by a firm's stage of development, whether it is in a growth and expansion phase or in maturity. Growing firms often rely on equity financing due to constraints in accessing debt, whereas mature firms tend to leverage their assets to secure debt financing (Romano et al., 2001).

In the context of family businesses, Baixauli-Soler et al. (2021) argue that older firms are more capable of generating sufficient internal resources, reducing their reliance on debt. Their findings show a negative association between firm age and total debt, with a significant negative impact on non-financial debt but no significant relationship with financial debt. Similarly, studies by Pacheco (2022) and Bjuggren et al. (2012) report that as family SMEs age, they tend to reduce their debt levels in pursuit of financial independence. In the same vein, Jansen et al. (2023) found that older family firms rely more heavily on internal financing, exhibiting negative associations, albeit mostly insignificant, with other funding options, such as bank debt, family equity, and external equity.

Based on these insights, we posit that older firms are likely to have less debt due to their slower growth and accumulation of internal funds over time (Lardon et al., 2017). Thus, in line with the pecking order theory, we propose the following hypothesis:

H7. *Firm age negatively affects the debt levels of Moroccan family SMEs.*

4. Research Methodology

4.1. Study's Context

Small and medium-sized enterprises (SMEs) dominate the Moroccan economy, with the majority being very small or micro-enterprises that generate an annual turnover of less than 3 million MAD. Collectively, small and medium firms represent approximately 99% of all firms in Morocco, while large enterprises account for only 0.5% (OMTPME, 2024). However, according to the Moroccan SME Observatory, large enterprises receive 59.1% of the total contracted loans, reflecting their privileged access to debt financing. In contrast, despite their overwhelming numerical dominance, SMEs collectively access only 40.9% of the total loans, highlighting a significant imbalance in credit allocation.

On the supply side, a study by the High Commission for Planning (HCP, 2019) has revealed that the primary reason for loan rejections among SMEs is their inability to provide sufficient collateral. Another major factor is the lack of trust in SMEs by the banking system,

driven by informational asymmetry and the absence of strong, long-term relationships between SMEs and banks. Furthermore, some loan applications are rejected without a clear explanation, while other reasons include perceptions of over-indebtedness or concerns about the quality of proposed projects.

On the demand side, SME managers report avoiding debt financing due to interest rates, which are perceived as excessive. Additionally, insufficient collateral further constrains an SME's ability to apply for loans. Beyond these economic factors, religion plays a critical role in shaping the financial decisions of Moroccan SMEs. As a Muslim-majority country, where Islam is the state religion according to Article 3 of the Moroccan Constitution, religious beliefs significantly influence financing behavior. Indeed, Islamic principles prohibit interest-based debt financing, as it generates illegitimate benefits for the lender. This cultural and religious context is likely to impact the debt financing decisions of both family and non-family Moroccan SMEs, leading religious managers and decision-makers to rely less on debt financing as Islam urges Muslims to avoid debt (Lebdaoui & Chetioui, 2021). The effect of the Islamic religion on debt financing behaviors in Muslim majority countries has been documented in a number of recent empirical studies in Muslim-majority countries, such as Morocco (Rhoudri & Ougoujil, 2024), Malaysia (Brahmana & You, 2022), and Lebanon (Bizri et al., 2018).

Overall, the Moroccan context is particularly relevant for such a study for several reasons. First, it is a bank-based economy where debt financing is the primary financing source for firms of all sizes, and this study would help enhance debt financing dynamics in this under-explored economy. Second, family ownership predominates in the national economy, with most SMEs being family-owned (Minialai, 2013). However, despite their prevalence, Moroccan family SMEs remain under-researched due to the lack of dedicated studies, both theoretical and empirical, particularly in the field of corporate finance. Existing research tends to focus on broad generalizations (Karim, 2016). These gaps underscore the importance of investigating the corporate financing behavior of Moroccan family SMEs in greater depth.

4.2. Sample and Data

The study utilizes panel data from a sample of Moroccan SMEs retrieved from the Orbis database by Moody's Analytics (formerly Bureau Van Dijk). The Orbis database provides both financial and non-financial data on over 500 million firms worldwide and has been used in an important volume of empirical studies (e.g., Boumlik et al., 2024; Quiddi & Habba, 2021). Our sampling process began by defining key selection criteria. First, we included all active firms based in Morocco. We then limited the sample to SMEs adopting the SME definition provided by the Moroccan Observatory of Very Small, Small, and Medium Enterprises, which classifies SMEs as firms with annual revenue between 10 million MAD and 175 million MAD. Further filtering was done to ensure firms had annual accounts available from 2017 to 2022 and that ownership data were available. Finally, the sample was restricted to privately held SMEs, excluding publicly listed firms. Following these steps, we obtained a final sample of 200 SMEs with all the necessary data for analysis.

In this study, we defined a family SME as any company with annual revenue ranging from 10 million to 175 million MAD and where more than 50% of the voting rights are held by a family group connected by blood or marriage. This 50% ownership threshold, widely adopted in prior research (Arena & Michelon, 2018; Burgstaller & Wagner, 2015; Calabrò et al., 2017; Che & Langli, 2015; Pongelli et al., 2023), ensures absolute family control and influence over the firm. Using this criterion, 110 firms were classified as family SMEs, while 90 were classified as non-family SMEs to serve as a comparison group.

4.3. Variables

- *Dependent variable*

The dependent variable in our research is the debt level. The level of indebtedness reflects a firm's financial structure and provides a clear indication of its financial management. Various measures of indebtedness are used in the literature, but relying on a single proxy or measure is often insufficient, as it may lead to inaccurate conclusions regarding a firm's capital structure (Hamid et al., 2015). In this study, we employ alternative measures of indebtedness, as we believe they will offer a more comprehensive understanding of the debt behaviors of Moroccan family SMEs and capture different aspects of indebtedness.

First, we use the total debt ratio (TD), calculated as the ratio of total debt to total assets (Baixauli-Soler et al., 2021; Molly et al., 2019). The second measure is the long-term debt ratio (LTD), defined as the ratio of long-term debt to total assets (Molly et al., 2019), The third measure is the short-term debt ratio (STD), calculated as the ratio of short-term debt to total assets (Molly et al., 2019). The last measure is the leverage measured by the ratio of debt to equity (Quiddi & Habba, 2021).

- *Independent and control variables*

A firm's profitability (ROA) is expected to have a negative association with its leverage insofar as a profitable firm would rely on earnings to finance investments (Villalonga & Amit, 2006), and it is measured by the ratio of net revenue to total assets (González et al., 2012). Liquidity (LIQ) reflects internal resource availability (Jansen et al., 2023) and is measured by the ratio of current assets to current liabilities (Blanco-Mazagatos et al., 2024; Comino-Jurado et al., 2021). Asset tangibility (TANG) is measured by the ratio of tangible fixed assets to total assets (Baixauli-Soler et al., 2021). Furthermore, the non-debt tax shield (NDTS) is measured by the ratio of total annual depreciation to total assets (Latrous & Trabelsi, 2012). Growth opportunities (GROWTH) are measured by the annual variation in total assets (Burgstaller & Wagner, 2015). The firm size (SIZE) is the natural logarithm of total assets (Baixauli-Soler et al., 2021; Li et al., 2021). Firm age (AGE) is measured by the number of years since its establishment (Ginesti et al., 2023). Moreover, we use industry dummies and year dummies to control for industry effect and time effect, respectively.

4.4. Econometric Analysis Technique

This study uses panel data regression to identify key determinants of the debt financing behavior of Moroccan family SMEs. First of all, we start the data analysis through a correlation matrix to deduce the initial relationship tendencies between our variables. Then, a difference in mean test is performed in order to investigate the peculiarities of the financing structure of family SMEs compared to that of non-family ones and to deduce any significant differences with regard to potential capital structure determinants. We further proceed to multivariate analysis using panel data analysis for hypothesis testing. In effect, pooled OLS, fixed effect, and random effect models were performed. In order to select the appropriate estimation model, the Breusch and Pagan Lagrangian multiplier and Hausman test were performed, and the results are reported in Table A1. Overall, the research model could be presented as follows:

$$DEBT_{i,t} = C + \beta 1\ ROA_{i,t} + \beta 2\ GROWTH_{i,t} + \beta 3\ TANG_{i,t} + \beta 4\ NDTS_{i,t} + \beta 5\ LIQ_{i,t} + \beta 6\ SIZE_{i,t} + \beta 7\ AGE_{i,t} + \beta 8\ INDUSTRY + \beta 9\ YEAR + \mathcal{E}_{i,t}$$

where

i = 1, . . ., 200, represents the cross-sectional dimension of the data,
t = 2018, . . ., 2022, denotes the time dimension,
ε represents the error term,

and DEBT refers to either TD, STD, LTD or DER of firm i in year t.
For data analysis, the authors used STATA software version 15 for windows.

5. Results

5.1. Descriptive Statistics and Difference in Mean Test

Table 1 provides the descriptive statistics for our dataset. Panel 1 summarizes the descriptive statistics for all sample firms. Additionally, the table presents the characteristics and descriptive statistics for the two research sub-samples. Family SMEs and non-family firms have been analyzed separately.

Table 1. Descriptive statistics.

Variables	N	Mean	Std Dev.	Min	Max	Skew	Kurt
Panel 1: Total sample							
TD	1000	0.642	0.251	0	2.465	1.022	11.086
STD	1000	0.586	0.251	0	2.45	1.313	11.76
LTD	1000	0.056	0.112	0	1.016	3.521	20.371
DER	1000	2.811	4.448	−35.873	37.176	−0.077	21.164
ROA	1000	0.035	0.093	−0.971	0.608	−1.648	30.187
TANG	1000	0.115	0.151	0	0.917	2.175	8.318
GROWTH	1000	0.118	0.439	−0.996	6.227	5.939	62.324
NDTS	1000	0.025	0.033	0	0.281	3.045	15.643
LIQ	1000	1.924	2.634	0	39.052	9.738	117.52
SIZE	1000	7.754	1.043	3.507	11.071	−0.155	3.48
AGE	1000	19.875	15.919	3	122	3.844	24.022
Panel 2: Family SMEs							
TD	550	0.598	0.203	0.001	1	−0.494	2.594
STD	550	0.545	0.194	0.001	1	−0.231	2.539
LTD	550	0.053	0.098	0	0.551	2.574	10.18
DER	550	2.457	2.509	0.026	20.486	2.733	14.367
ROA	550	0.033	0.061	−0.446	0.409	−0.083	18.11
TANG	550	0.113	0.138	0	0.687	1.824	6.153
GROWTH	550	0.091	0.404	−0.996	6.227	7.949	107.882
NDTS	550	0.023	0.032	0	0.281	3.811	23.524
LIQ	550	2.033	3.011	0	39.052	9.828	110.288
SIZE	550	7.887	0.898	3.507	10.145	−0.717	5.172
AGE	550	21.555	13.842	4	122	3.44	24.227
Panel 3: Non-family SMEs							
TD	450	0.696	0.292	0	2.465	1.367	11.443
STD	450	0.636	0.3	0	2.45	1.506	11.123
LTD	450	0.06	0.127	0	1.016	3.876	22.517
DER	450	3.243	5.999	−35.873	37.176	−0.493	13.88
ROA	450	0.038	0.122	−0.971	0.608	−1.677	21.844
TANG	450	0.117	0.166	0	0.917	2.364	9.087
GROWTH	450	0.152	0.477	−0.719	4.578	4.355	31.971
NDTS	450	0.027	0.035	0	0.191	2.276	8.503
LIQ	450	1.791	2.078	0	27.237	7.365	75.054
SIZE	450	7.59	1.176	4.627	11.071	0.325	2.821
AGE	450	17.822	17.94	3	122	4.185	23.744

Source: Authors' calculations.

The descriptive statistics reveal that Moroccan SMEs rely heavily on debt financing, with debt constituting 64% of total liabilities on average. Non-family SMEs exhibit higher debt levels (69%) compared to family SMEs (59%), indicating that family SMEs depend

less on debt. Short-term debt dominates, averaging 58%, with family SMEs showing lower short-term debt levels (54%) than non-family SMEs (63%). Long-term debt remains minimal at 5% for family SMEs and 6% for non-family SMEs, reflecting similar borrowing behaviors for long-term financing. Leverage is high across Moroccan SMEs, with a debt-to-equity ratio (DER) of 280%, although family SMEs maintain lower leverage (2.45) than non-family SMEs (3.24), reflecting a more conservative financial structure.

Profitability (ROA) is modest at 0.03, with no significant differences between family and non-family SMEs. Asset tangibility is low, averaging 11%, suggesting a liquid balance sheet structure for both groups. Growth rates highlight that non-family SMEs expand more rapidly (15.2%) than family SMEs (9%). Non-debt tax shields average 2.5% of total assets, with slightly lower levels for family SMEs. Liquidity levels are healthy, with family SMEs exhibiting higher liquidity (2.03) than non-family SMEs (1.79).

Regarding size and age, family SMEs are generally larger and older, with an average age of 21.5 years compared to that of 17.82 years for non-family SMEs, reflecting greater market maturity. Overall, the data suggest distinct financial and operational characteristics between family and non-family SMEs, with family SMEs adopting more conservative financial strategies

To further investigate the significant differences between the characteristics of family and non-family SMES, the Student test for the difference in mean is performed and the results are reported in Table 2.

Table 2. Test for differences in means (T-test).

Variables	Mean NFF	Mean FF	DIF	ST ERR	T Value	*p* Value
TD	0.696	0.598	0.098	0.016	6.25	0
STD	0.636	0.544	0.091	0.016	5.8	0
LTD	0.060	0.053	0.007	0.007	1	0.328
DER	3.243	2.458	0.786	0.282	2.8	0.005
ROA	0.037	0.033	0.005	0.006	0.75	0.466
TANG	0.117	0.114	0.004	0.009	0.35	0.711
GROWTH	0.152	0.09	0.061	0.028	2.2	0.029
NDTS	0.028	0.024	0.004	0.002	1.85	0.061
LIQ	1.792	2.034	−0.242	0.168	−1.45	0.148
SIZE	7.591	7.887	−0.297	0.066	−4.5	0
AGE	17.822	21.555	−3.732	1.006	−3.7	0

Source: Authors' calculations.

The mean difference test (T-test) highlights significant distinctions between family and non-family SMEs. Family SMEs have significantly lower total debt (0.598 for Family SMEs compared to 0.696 for non-family SMEs) and short-term debt (0.544 for family SMEs compared to 0.636 for non-family SMEs), with both differences being significant at the 1% level. However, no significant difference can be found for long-term debt, with similar averages for both groups. Family SMEs also display a lower debt-to-equity ratio (2.458) compared to non-family SMEs (3.243), reflecting their more conservative financial structure.

Beyond financing, family SMEs are significantly larger and older than their non-family counterparts but exhibit lower non-debt tax shields and slower growth rates. No significant differences are observed between the two groups in terms of profitability, asset tangibility, or liquidity. These findings underscore distinct financial and operational characteristics, with family SMEs favoring a more cautious financial approach.

5.2. Correlation and Multicollinearity Analysis

Profitability (ROA) shows a consistent negative relationship with all debt measures across Moroccan SMEs, indicating that more profitable firms rely less on debt financing.

This trend applies to both family and non-family SMEs, although the relationship with the debt-to-equity ratio loses significance for non-family SMEs. Similarly, liquidity is negatively associated with the total debt, short-term debt, and debt-to-equity ratio across all samples, highlighting a preference for internal funds over debt. Its relationship with long-term debt, however, is negative but insignificant.

Asset tangibility exhibits varied effects. In the overall sample, tangibility is negatively associated with short-term debt and the debt-to-equity ratio but positively linked to long-term debt, suggesting that tangible assets enhance access to long-term borrowing. For family SMEs, tangibility strengthens the negative association with short-term and total debt, reflecting a cautious approach to leverage while maintaining a modest positive link with long-term debt. Non-family SMEs show a positive association between tangibility and long-term debt but no significant link with short-term or total debt.

Non-debt tax shields (NDTS) are negatively associated with short-term debt, total debt, and the debt-to-equity ratio, while positively linked to long-term debt in the overall and family SME samples. For non-family SMEs, NDTS remain positively associated with long-term debt but exhibit no significant relationship with short-term or total debt.

Growth opportunities are positively linked to short-term debt, total debt, and the debt-to-equity ratio in the overall and family SME samples, emphasizing the reliance of family firms on debt to support expansion. However, for non-family SMEs, growth is only significantly associated with the debt-to-equity ratio.

Firm age negatively influences debt, particularly for family SMEs, where it shows a strong negative association with all leverage measures. Non-family SMEs exhibit mixed results, with firm age being positively correlated with long-term debt but negatively linked to short-term debt and the debt-to-equity ratio.

Firm size positively correlates with all debt measures in the overall sample, indicating that larger firms are more inclined to use debt financing. This positive relationship persists for family SMEs, except for long-term debt, where the association loses significance. In non-family SMEs, firm size is consistently and significantly associated with all leverage measures. Overall, the findings highlight key differences in debt policies between family and non-family SMEs, which are influenced by profitability, tangibility, growth, and the firm's characteristics.

The correlation matrix is presented in Table 3.

The correlation matrix provides an initial understanding of the relationships between the explanatory variables and the debt financing proxies. Furthermore, all correlation coefficients between our independent variables in the dataset are below the 0.8 threshold, indicating that correlation is not a concern. To further assess potential multicollinearity issues that can bias our estimations, we have conducted a Variance Inflation Factor (VIF) test. The results confirm the absence of multicollinearity issues, as all VIF values are below the critical threshold of 10. The VIF test results are reported in Table A2.

Table 3. Correlation matrix for all sample data.

Variables	Panel 1: All Sample (N = 200)										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
(1) STD	1.000										
(2) TD	0.900 ***	1.000									
(3) LTD	−0.219 ***	0.227 ***	1.000								
(4) DER	0.288 ***	0.325 ***	0.084 ***	1.000							
(5) ROA	−0.258 ***	−0.319 ***	−0.140 ***	−0.084 ***	1.000						
(6) LIQ	−0.431 ***	−0.440 ***	−0.022	−0.133 ***	0.086 ***	1.000					
(7) TANG	−0.141 ***	−0.033	0.242 ***	−0.170 ***	−0.022	−0.124 ***	1.000				
(8) NDTS	−0.128 ***	−0.068 **	0.134 ***	−0.128 ***	−0.016	−0.062 **	0.576 ***	1.000			
(9) GROWTH	0.121 ***	0.108 ***	−0.029	0.140 ***	0.131 ***	−0.079 **	−0.030	−0.099 ***	1.000		
(10) AGE	−0.138 ***	−0.123 ***	0.032	−0.121 ***	−0.013	−0.007	0.186 ***	0.136 ***	−0.088 ***	1.000	
(11) SIZE	0.092 ***	0.181 ***	0.197 ***	0.227 ***	−0.115 ***	−0.116 ***	−0.094 ***	−0.120 ***	0.014	0.061 *	1.000

Table 3. *Cont.*

Panel 2: Family SMEs (N = 110)											
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
(1) STD	1.000										
(2) TD	0.880 ***	1.000									
(3) LTD	−0.162 ***	0.327 ***	1.000								
(4) DER	0.609 ***	0.751 ***	0.348 ***	1.000							
(5) ROA	−0.317 ***	−0.379 ***	−0.156 ***	−0.289 ***	1.000						
(6) LIQ	−0.446 ***	−0.440 ***	−0.026	−0.196 ***	0.163 ***	1.000					
(7) TANG	−0.260 ***	−0.170 ***	0.163 ***	−0.165 ***	0.013	−0.112 ***	1.000				
(8) NDTS	−0.239 ***	−0.179 ***	0.105 **	−0.148 ***	0.058	−0.034	0.506 ***	1.000			
(9) GROWTH	0.197 ***	0.191 ***	0.005	0.192 ***	0.033	−0.091 **	0.025	−0.062	1.000		
(10) AGE	−0.142 ***	−0.203 ***	−0.139 ***	−0.173 ***	0.007	0.006	0.167 ***	0.090 **	−0.057	1.000	
(11) SIZE	0.189 ***	0.207 ***	0.055	0.109 **	−0.165 ***	−0.091 **	−0.082 *	−0.075 *	0.108 **	−0.011	1.000
Panel 3: Non-family SMEs (N = 90)											
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
(1) STD	1.000										
(2) TD	0.907 ***	1.000									
(3) LTD	−0.270 ***	0.159 ***	1.000								
(4) DER	0.175 ***	0.171 ***	−0.019	1.000							
(5) ROA	−0.249 ***	−0.315 ***	−0.137 ***	−0.035	1.000						
(6) LIQ	−0.487 ***	−0.506 ***	−0.015	−0.124 ***	0.045	1.000					
(7) TANG	−0.073	0.059	0.304 ***	−0.186 ***	−0.041	−0.153 ***	1.000				
(8) NDTS	−0.073	−0.006	0.158 ***	−0.142 ***	−0.061	−0.106 **	0.645 ***	1.000			
(9) GROWTH	0.055	0.030	−0.060	0.120 **	0.186 ***	−0.059	−0.079 *	−0.145 ***	1.000		
(10) AGE	−0.107 **	−0.039	0.162 ***	−0.094 **	−0.018	−0.038	0.206 ***	0.194 ***	−0.100 **	1.000	
(11) SIZE	0.081 *	0.219 ***	0.310 ***	0.308 ***	−0.091 *	−0.184 ***	−0.103 **	−0.147 ***	−0.041	0.086 *	1.000

Note. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. **Source**: Authors' calculations.

5.3. Multivariate Analysis Results

To analyze the determinants of the financial structures of Moroccan family SMEs, we employ multiple linear regression to examine the effect of economic factors on the debt levels of the firms in our study sample. To enhance the depth of the analysis and enable meaningful comparisons, we conduct regressions on three distinct samples to better capture the unique capital structure dynamics of family SMEs.

First, we perform regressions on the full sample, which includes both family and non-family SMEs. The aim is to identify the factors influencing the financial structures of Moroccan SMEs in general, regardless of their ownership type. Next, we estimate the same regression models to the family SME sample and a third sample composed of non-family SMEs. This allows us to investigate whether the impacts of certain factors differ depending on the type of SME under consideration.

The results of the regression estimations for the various models are presented in Table 4.

Table 4. Regression results.

	Panel 1: All Sample Firms				**Panel 2: Family SMEs**				**Panel 3: Non-Family SMEs**			
	(1) TD	**(2) STD**	**(3) LTD**	**(4) DER**	**(5) TD**	**(6) STD**	**(7) LTD**	**(8) DER**	**(9) TD**	**(10) STD**	**(11) LTD**	**(12) DER**
ROA	−0.667 ***	−0.633 ***	−0.040	−0.759	−0.597 ***	−0.531 ***	−0.083	−10.744 ***	−0.625 ***	−0.594 ***	−0.036	0.496
	(0.097)	(0.099)	(0.029)	(3.583)	(0.092)	(0.107)	(0.073)	(2.621)	(0.083)	(0.081)	(0.031)	(3.523)
Growth	0.036 ***	0.032 ***	0.002	0.694 ***	0.027 **	0.028 **	0.000	0.601 ***	0.048 ***	0.043 **	0.004	0.843 *
	(0.010)	(0.012)	(0.006)	(0.263)	(0.012)	(0.013)	(0.005)	(0.136)	(0.013)	(0.018)	(0.010)	(0.496)
TANG	0.163	0.001	0.168 ***	−5.353	0.026	−0.208	0.200 **	−2.066 **	0.257	0.145	0.159	−5.667
	(0.122)	(0.123)	(0.063)	(4.044)	(0.093)	(0.126)	(0.083)	(0.900)	(0.210)	(0.191)	(0.101)	(6.428)
LIQ	−0.014 ***	−0.015 ***	0.001	0.007	−0.011 ***	−0.011 ***	0.000	−0.011	−0.026 ***	−0.028 ***	0.002	0.073
	(0.003)	(0.003)	(0.001)	(0.022)	(0.002)	(0.002)	(0.001)	(0.018)	(0.008)	(0.009)	(0.002)	(0.085)
NDTS	−0.568	−0.586	0.022	20.879	−0.447	−0.409	−0.037	−7.432 **	−0.832	−0.851	0.083	61.935 *
	(0.470)	(0.521)	(0.141)	(16.871)	(0.314)	(0.391)	(0.175)	(3.192)	(1.024)	(1.085)	(0.199)	(33.620)
Size	0.086 ***	0.073 **	0.017 **	1.603 **	0.131 ***	0.119 ***	0.011 *	0.818 *	−0.008	−0.018	0.025 *	3.215 ***
	(0.026)	(0.028)	(0.007)	(0.635)	(0.016)	(0.014)	(0.006)	(0.473)	(0.076)	(0.078)	(0.014)	(0.910)
Age	−0.004	−0.015 ***	−0.000	−0.163	−0.009 ***	−0.018 ***	−0.002 ***	−0.110 **	0.006	−0.007	0.000	−0.324
	(0.004)	(0.004)	(0.000)	(0.122)	(0.003)	(0.003)	(0.001)	(0.045)	(0.009)	(0.009)	(0.001)	(0.260)
Industry	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Years	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	0.115	0.389 **	−0.092 *	−6.310	−0.178	0.083	−0.019	−0.818	0.715	0.974 **	−0.175 *	−16.641 **
	(0.164)	(0.177)	(0.050)	(4.776)	(0.134)	(0.131)	(0.080)	(3.498)	(0.472)	(0.473)	(0.096)	(6.958)
OBS	1000	1000	1000	1000	550	550	550	550	450	450	450	450
R-squared	0.364	0.331		0.052	0.555	0.506		0.260	0.330	0.304		0.081

Table 4. *Cont.*

	Panel 1: All Sample Firms				Panel 2: Family SMEs				Panel 3: Non-Family SMEs			
	(1) TD	(2) STD	(3) LTD	(4) DER	(5) TD	(6) STD	(7) LTD	(8) DER	(9) TD	(10) STD	(11) LTD	(12) DER
Wald CHI 2			121.92 ***				79.37 ***				49.61 ***	
F-TEST	27.88 ***	24.15 ***		5.43 ***	28.32 ***	25.38 ***		9.89 ***	11.96 ***	12.84 ***		2.39 ***

Note. Models 3, 7, and 11 were estimated using the random effects method, while the other models were estimated using the fixed effects method, as determined by the results of the Hausman test, BPLM test, and F-test (see Appendix A for details). All regression models were estimated with the robust option. Standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. **Source**: Authors' calculations.

- *Determinants of family SME debt policies*

The regression analysis results for the family SME sample indicate a good fit for the regression models. The Fisher test is significant at the 1% level for all fixed-effect models, and the Wald chi-2 statistic is also significant at the 1% level for the random-effect regression model. These results suggest that the regression models are generally well-specified.

Moreover, regression models (5), (6), and (8) exhibit strong explanatory power, with R^2 values of 55.5%, 50%, and 26%, respectively. These relatively high R^2 values indicate good model specification and suggest that the variables included in the models are relevant factors, explaining a substantial portion (exceeding 50% in models (5) and (6)) of the variance in the debt levels of Moroccan family SMEs.

For a more comprehensive understanding of the findings, the results will be interpreted determinant by determinant, followed by a global synthesis and comparison of the firm-level determinants of family and non-family SMEs.

Profitability demonstrates significant associations with several debt proxies for Moroccan family SMEs. Specifically, profitability shows a pronounced negative effect in three out of the four estimated models: total debt (TD) (−0.597 ***), short-term debt (STD) (−0.531 ***), and the debt-to-equity ratio (DER) (−10.744 ***). These effects are significant at the 1% level across the respective models, indicating a well-established inverse relationship between profitability and debt levels. Notably, profitability emerges as the most influential determinant among the variables studied, with the highest coefficients in the models where it has a significant impact. This suggests that profitable family SMEs tend to reduce their reliance on debt financing, favoring retained earnings as their primary funding source. These findings largely support the research hypothesis H1, affirming that profitability negatively affects the debt levels of Moroccan family SMEs.

The econometric analysis reveals that liquidity, measured as the ratio of current assets to current liabilities, has a significant effect on two debt proxies, which are the total debt (TD) (−0.011 ***) and the short-term debt (STD) (−0.011 ***) proxies. These findings indicate that sufficient liquid assets reduce reliance on external financing, particularly short-term debt. This confirms hypothesis H2 and suggests that Moroccan family SMEs with strong internal financial resources tend to avoid debt, adopting a conservative financing approach that prioritizes self-financing.

Growth opportunities have a positive effect on several debt ratios. Specifically, the results indicate that growth opportunities significantly influence total debt (TD) (0.027 **) and short-term debt (STD) (0.028 **) at the 5% significance level and the debt-to-equity ratio (DER) (0.601 ***) at the 1% significance level. However, no significant effect is observed in the model where long-term debt is the dependent variable. This suggests that family SMEs primarily finance growth opportunities through short-term debt. Those findings indicate that family SMEs with greater growth opportunities increasingly rely on debt financing, with short-term debt as their primary funding choice. These results confirm hypothesis H3 in three models, demonstrating that growth opportunities lead to higher indebtedness among Moroccan family SMEs.

With regard to asset tangibility, the econometric estimations confirm a significant relationship between tangibility and two debt proxies: a positive effect on long-term debt (LTD) (0.200 **) and a negative effect on the debt-to-equity ratio (DER) (−2.066 **). Surprisingly, no significant relationship is found between tangibility and total debt (TD) or short-term debt (STD). These seemingly contradictory results reflect different aspects of the relationship between asset tangibility and capital structure decisions. The positive effect on long-term debt suggests that family SMEs with higher asset tangibility use their tangible assets as collateral, facilitating access to long-term financing at favorable terms and leading to increased long-term debt levels. Conversely, the negative effect on the debt-to-equity ratio indicates that firms with significant tangible assets tend to reduce overall debt reliance, favoring equity financing to maintain a balanced financial structure. This implies that while family SMEs leverage their tangible assets for long-term borrowing, they adopt a conservative financial strategy, avoiding excessive debt and maintaining a low overall debt-to-equity ratio. Overall, the results validate hypothesis H4 only for long-term debt (LTD: model 7), while for other debt measures, the observed effects are either non-significant or negative.

The findings indicate that non-debt tax shields have a significant effect on only one debt proxy: the debt-to-equity ratio (DER) (−7.432 **). While non-debt tax shields exhibit a negative relationship with all debt measures, the debt-to-equity ratio is the only proxy where this effect is statistically significant. This suggests that firms with substantial non-debt tax shields tend to maintain a lower debt-to-equity ratio.

These results imply that, although non-debt tax shields do not have direct significant effects on total debt levels or debt maturity, they may influence the debt-to-equity ratio by encouraging Moroccan family SME managers to avoid debt and prioritize equity financing. This preference supports maintaining financial independence and a lower leverage ratio. While hypothesis H5 is supported in model 8, where the dependent variable is the debt-to-equity ratio, it is rejected in the other models.

Regarding the firm size, the results indicate a positive association between firm size and debt level. Specifically, the regression models consistently show the significant and positive effects of firm size on all debt proxies: total debt (TD: 0.131 ***), short-term debt (STD: 0.119 ***), long-term debt (LTD: 0.011 *), and the debt-to-equity ratio (DER: 0.818 *). These findings confirm hypothesis H6, suggesting that larger firms are more likely to increase their debt levels. This relationship can be explained by the fact that larger firms often have sufficient collateral, greater diversification, and lower default risk. Overall, the results of this study strongly support hypothesis H6.

Firm age has a negative and significant impact on the debt levels of Moroccan family SMEs. This finding is robust across different measures of debt, as the negative effect remains significant for all four debt proxies: total debt (TD: −0.009 ***), short-term debt (STD: −0.018 ***), long-term debt (LTD: −0.002 ***), and the debt-to-equity ratio (DER: −0.110 **). These results highlight the well-established relationship between firm age and debt. Specifically, the findings confirm that older Moroccan family SMEs tend to reduce their debt levels, supporting our research hypothesis H7. As family SMEs age, they rely increasingly less on debt financing.

- *Determinant of debt financing: family versus non-family SMEs*

To gain deeper insights into the debt behaviors of family SMEs and their driving factors, we conduct a comparative analysis of the determinants of debt behaviors across two distinct samples: family SMEs and non-family SMEs.

A summary of the econometric model estimations is presented in Table 5 below. To enhance clarity and ease of interpretation, the table provides a concise overview of the results from various regression models.

Table 5. Summary of debt determinants: family versus non-family SMEs.

	Family SMEs				Non-Family SMEs			
	TD	**STD**	**LTD**	**DER**	**TD**	**STD**	**LTD**	**DER**
ROA	−	−	**NS**	−	−	−	**NS**	**NS**
GROWTH	+	+	**NS**	+	+	+	**NS**	+
TANG	**NS**	**NS**	+	-	**NS**	**NS**	**NS**	**NS**
LIQ	−	−	**NS**	**NS**	−	−	**NS**	**NS**
NDTS	**NS**	**NS**	**NS**	−	**NS**	**NS**	**NS**	+
SIZE	+	+	+	+	**NS**	**NS**	+	+
AGE	−	−	−	−	**NS**	**NS**	**NS**	**NS**

Note. Ns: Non-significant; (−): negative significant effect; (+): positive significant effect. **Source**: Authors' analyses.

The comparative analysis reveals distinct debt behaviors between family and non-family SMEs in Morocco. Profitability negatively affects debt levels in both categories, with a stronger impact on family SMEs, reflecting their preference for financial independence. Growth opportunities positively influence debt in both groups, primarily through short-term debt and total debt. Tangibility significantly affects long-term debt and reduces the debt-to-equity ratio in family SMEs, highlighting their use of tangible assets as collateral, a relationship absent in non-family SMEs. Liquidity consistently reduces short-term debt and total debt for both categories, showing a shared reliance on internal financing. Non-debt tax shields enable family SMEs to minimize debt relative to equity, whereas non-family SMEs use them alongside debt to maximize tax shield. Firm size positively impacts debt in both groups, with a stronger effect on family SMEs, while age only significantly reduces debt levels in family SMEs, emphasizing their conservative financing strategies as they mature.

To econometrically assess whether the debt behaviors differ between family and non-family SMEs, it is essential to conduct a coefficient difference test. This test determines whether the coefficients of the exogenous variables in our models vary significantly between the two samples. For this purpose, we employed the Chow test, and the results are reported in Table 6 below.

The Chow test results provide insights into whether the determinants of debt behaviors differ between family and non-family SMEs. For the total debt (TD) model, no significant differences are found in the effects of independent variables between the two groups, as indicated by a global *p*-value of 0.3607. Similarly, for the short-term debt (STD) model, the explanatory variables exhibit consistent effects across both groups, with a global *p*-value of 0.2631.

Table 6. Chow test results.

Family versus Non-Family SMEs	**F-Statistic (Prob > f) /chi 2 (Prob > chi2)**	**F-Statistic (Prob > f) /chi 2 (7) (Prob > chi2)**
	Dependent variable: TD	
ROA = 0	0.07 (0.7922)	
GROWTH = 0	1.33 (0.2494)	
TANG = 0	0.96 (0.3277)	
LIQ = 0	3.59 (0.0597)	
NDTS = 0	0.12 (0.7246)	
SIZE = 0	3.27 (0.0721)	
AGE = 0	2.17 (0.1419)	
Global Difference		1.11 (0.3607)
	Dependent variable: STD	
ROA = 0	0.23 (0.6317)	
GROWTH = 0	0.45 (0.5045)	
TANG = 0	2.38 (0.1247)	
LIQ = 0	3.36 (0.0682)	
NDTS = 0	0.14 (0.7066)	
SIZE = 0	3.07 (0.0815)	
AGE = 0	1.17 (0.2814)	
Global Difference		1.28 (0.2631)

Table 6. *Cont.*

Family versus Non-Family SMEs	F-Statistic (Prob > f) /chi 2 (Prob > chi2)	F-Statistic (Prob > f) /chi 2 (7) (Prob > chi2)
	Dependent variable: LTD	
ROA = 0	0.11 (0.7355)	
GROWTH = 0	0.31 (0.5751)	
TANG = 0	0.17 (0.6825)	
LIQ = 0	0.37 (0.5420)	
NDTS = 0	0.01 (0.9135)	
SIZE = 0	1.05 (0.3060)	
AGE = 0	4.59 (0.0322)	
Global Difference		5.92 (0.5492)
	Dependent variable: DER	
ROA = 0	6.17 (0.0138)	
GROWTH = 0	0.49 (0.4827)	
TANG = 0	0.32 (0.5744)	
LIQ = 0	1.44 (0.2311)	
NDTS = 0	4.26 (0.0402)	
SIZE = 0	6.08 (0.0145)	
AGE = 0	0.88 (0.3481)	
Global Difference		2.52 (0.0167)

Source: Authors' calculations.

In the long-term debt (LTD) model, only one variable, firm age, shows a significant difference in its effect between family and non-family SMEs, suggesting that the impact of age on long-term debt behavior differs between the two categories. However, the overall test (p-value = 0.5492) indicates that there are no significant differences in the coefficients across the two groups.

For the debt-to-equity ratio (DER) model, significant differences are identified for profitability (ROA), non-debt tax shields (NDTS), and firm size (SIZE), with p-values of 0.0138, 0.0402, and 0.0145, respectively. Profitability negatively affects family SMEs' leverage but has an insignificant positive effect on non-family SMEs. NDTS negatively impacts family SMEs' leverages but positively influences non-family SMEs, highlighting the differences in financial strategies. While the firm size positively affects leverage in both groups, the effect is more pronounced in non-family SMEs due to their less conservative financing strategies.

Overall, the test reveals that the debt behaviors for total debt, short-term debt, and long-term debt are largely similar between family and non-family SMEs. Significant differences are observed in the DER model, indicating that the financial strategies of family SMEs, particularly concerning profitability, NDTS, and size, differ from those of non-family SMEs. However, no robust evidence is found to suggest a systematic differentiation in debt behaviors across the two groups.

6. Discussion

This study aims to analyze the determinants of the debt behaviors of unlisted Moroccan family SMEs. Through univariate and multivariate analyses, we have identified key factors influencing the capital structures of these firms. As is consistent with our expectations, profitability is found to have a robust negative effect on debt levels, significantly impacting short-term debt (STD), total debt (TD), and the debt-to-equity ratio (DER). These findings align with prior studies, such as the study by Molly et al. (2019), which reported a negative relationship between profitability and both the short-term debt and total debt and no significant effect on the long-term debt in Belgian family SMEs. Similarly, our results corroborate those by Baixauli-Soler et al. (2021), confirming that profitable family SMEs have less need for debt financing. These findings support our hypothesis H1 and are consistent with the pecking order theory (POT) (Myers & Majluf, 1984), which assumes that firms prefer internal funding over external financing sources. The theory suggests that

debt is costlier than internal-financing due to information asymmetry between firms and creditors, favoring retained earnings as the primary financing choice.

In the same vein, our findings reveal that liquidity has a negative effect on total debt (TD) and short-term debt (STD), while no significant impact is observed on long-term debt or the debt-to-equity ratio (DER). These findings align with those of Baixauli-Soler et al. (2021), which indicate that more liquid firms have less need for debt financing, and they are consistent with the results of Lardon et al. (2017). Indeed, the study supports the pecking order theory (POT), suggesting that Moroccan family SMEs with sufficient internal resources avoid relying on debt and instead utilize their internal resources to finance their operations.

With regard to growth opportunities, the findings suggest that they have a positive impact on the total debt, short-term debt, and debt-to-equity ratio, suggesting that family SMEs increase their debt to seize growth opportunities. This supports the findings of Burgstaller and Wagner (2015) but contrasts with those of López-Gracia and Sánchez-Andújar (2007), who found a negative relationship between growth opportunities and debt in small family firms. Our findings support the pecking order theory (POT), which suggests that firms with important growth opportunities exhaust internal resources and seek debt financing options.

Additionally, findings indicate that asset tangibility has a positive effect on long-term debt, suggesting that family SMEs leverage tangible assets as collateral to secure favorable long-term financing, which aligns with the findings of Molly et al. (2019). However, no significant relationship is found between tangibility and total or short-term debt, indicating that tangible assets are primarily used for long-term borrowing. Surprisingly, a negative relationship is observed between tangibility and the debt-to-equity ratio, implying that family SMEs with more tangible assets tend to favor equity financing, thus maintaining a conservative financial structure with lower overall debt levels. These results suggest that tangible assets play a role in mitigating information asymmetry between SMEs and lenders, facilitating access to financing. However, family SMEs appear to prioritize equity financing and avoid excessive debt to maintain financial stability and control. Indeed, the effect of asset tangibility on debt is complex and should be understood from multiple perspectives, as proven by Baixauli-Soler et al. (2021), who found a negative effect of asset tangibility on total debt. This finding remains consistent when considering non-financial debt but reverses when focusing on financial debt, indicating that tangibility has a positive effect on financial debt and a negative effect on non-financial debt. Moreover, the study by Molly et al. (2019) shows that tangibility has a positive effect on total debt, long-term debt and financial debt and a negative effect on short-term debt and non-financial debt. Overall, our study found limited support for agency theory regarding the positive relationship between asset tangibility and debt financing. This can be explained by the fact that, in the context of family SMEs, information asymmetry issues are assumed to be less pronounced, thereby reducing the need to use tangible assets as collateral for obtaining financing (Burgstaller & Wagner, 2015).

Furthermore, findings reveal that non-debt tax shields have a negative effect only on the debt-to-equity ratio (DER), while showing no significant impact on total debt (TD), short-term debt (STD), or long-term debt (LTD). These findings partially support those reported by López-Gracia and Sánchez-Andújar (2007), who observed a negative effect of non-debt tax shields on total debt levels in small Spanish firms, supporting the pecking order theory (POT). Indeed, Burgstaller and Wagner (2015) generally suggest that tax considerations have limited influence on the financial decisions of family businesses. However, our results indicate that family SMEs, unlike non-family SMEs, utilize non-debt tax shields to substitute potential tax advantages of debt, thereby adopting a conservative financial

strategy. Specifically, family SMEs leverage non-debt tax shields to achieve tax savings without increasing debt levels, thereby avoiding the financial distress risks associated with higher indebtedness.

With regard to firm size, research findings suggest that firm size is a key determinant of the capital structure of Moroccan family SMEs, with larger firms showing higher levels of debt. These results align with the conclusions of López-Gracia and Sánchez-Andújar (2007) and partially confirm those of Burgstaller and Wagner (2015), who found that firm size positively affects debt levels in family SMEs controlled by the founding generation but becomes non-significant in subsequent generations. Conversely, other studies, such as Baixauli-Soler et al. (2021), report an inverse relationship between firm size and debt levels. Indeed, the positive relationship is supported by the predictions of both the pecking order theory (POT) and the trade-off theory (TOT) as firm size is inversely related to bankruptcy costs (Degryse et al., 2012), and the trade-off theory posits that larger firms, which tend to be more diversified and exhibit lower profit volatility, face reduced bankruptcy costs. This enables them to increase debt levels at more favorable costs, reflecting a positive relationship between size and leverage.

Moreover, the findings of our study reveal that firm age is a significant determinant of the capital structure of Moroccan family SMEs. Specifically, our results indicate a robust negative relationship between firm age and various debt measures, suggesting that older firms tend to rely less on debt, regardless of the proxy used to assess leverage. These results align with those of Molly et al. (2019), who reported a negative effect of firm age on total debt levels, although their findings did not hold when short-term and long-term debt were considered separately. This highlights the complexity of understanding the relationship between firm age and debt without accounting for multiple dimensions of leverage. Indeed, our findings are consistent with those by Baixauli-Soler et al. (2021), who found that age negatively influences total debt levels among Spanish family SMEs. However, other studies, such as Burgstaller and Wagner (2015), found no significant link between firm age and debt levels, while Lardon et al. (2017) provided only limited evidence of this relationship.

Overall, the analysis reveals that debt financing behavior of Moroccan family SMEs aligns more closely with the predictions of the pecking order theory than with those of the trade-off or agency theories. This suggests that Moroccan family SMEs prioritize internal financing due to its lower cost, allowing them to preserve financial independence and maintain flexibility. Table 7 below provides a summary of the hypothesis tests and their theoretical alignment.

Table 7. Financing behavior of Moroccan family-SMEs: POT or TOT?

	Prediction of the POT	Prediction of the TOT or/and the Agency Theory	Empirical Validation
Proftability	−	+	POT
Growth	+	−	POT
Tangibility	+	+	Partially POT and TOT
Liquidity	−	+	POT
Ndts	−	−	POT & TOT
Size	+	+	POT & TOT
Age	−	+	POT

Source: Authors own creation.

The research findings indicate that the financing behavior of Moroccan family SMEs aligns with the propositions of the pecking order theory (POT). Specifically, testing the hypotheses related to the determinants of family SMEs' capital structure reveals that their financing behavior deviates from the predictions of the trade-off and agency theories and is perfectly consistent with those of the pecking order theory. These results contradict those of Serrasqueiro et al. (2012), who found that the capital structure decisions of family SMEs

align more closely with the predictions of trade-off theory, whereas those of non-family SMEs are better explained by the pecking order theory.

Overall, research findings are consistent with those of Jansen et al. (2023) and López-Gracia and Sánchez-Andújar (2007), suggesting that the debt financing behaviors of family SMEs perfectly align with the propositions of the pecking order theory. Indeed, our study demonstrates that the pecking order theory serves as a relevant theoretical framework for explaining the financial choices of family SMEs across different contexts, whether in developed or developing countries.

In addition, the comparative analysis indicates that the debt behavior of family SMEs slightly differs from that of non-family SMEs. Specifically, family SMEs demonstrate a more conservative approach influenced by their focus on maintaining control and minimizing default risk, which is evident in the differing effects of profitability, non-debt tax shields (NDTS), and firm size. Indeed, besides establishing reduced debt levels, Moroccan family SMEs tend to leverage NDTS as an alternative to debt's tax advantages, aligning with their preference for financial independence. Similarly, firm size plays a more pronounced role in shaping the debt behaviors of family SMEs compared to their non-family counterparts. These findings highlight the nuanced differences in financial decision-making, particularly in the context of equity-leveraged decisions. Nevertheless, the results do not provide conclusive evidence of a systematic differentiation in overall debt behavior between family and non-family SMEs, indicating that while there are areas of divergence, both groups share broadly similar financing patterns.

6.1. Robustness Analysis

Given that the study period coincides with two significant international events that may have influenced the supply side of liquidity and, consequently, the debt financing behaviors of Moroccan SMEs, we conduct a robustness analysis to account for the potential time effect on the determinants of debt policy. While our initial panel estimations include year-fixed effects to capture the macroeconomic effects on the dependent variable, year-fixed effects alone address these influences as a lump sum without accounting for changes in the relationship between the dependent variable and its determinants.

Macroeconomic forces, such as the COVID-19 crisis, unconventional monetary policies (Cortes et al., 2022a), and geopolitical tensions (Cortes et al., 2022b), may not directly impact the dependent variable but rather alter the elasticity of the dependent variable in relation to its determinants. To address this, we introduce interaction terms between the year variable and the key determinants (e.g., $ROA_{i,t} \times Year_t$) to capture any variations in the effects of these determinants on debt proxies over specific years. This approach allows us to assess whether the influences of the determinants evolve with macroeconomic changes during the study period, ensuring a more robust and nuanced analysis. The robustness test is conducted only on the sample of the family SMEs as it is the primary focus of the paper. The results are reported in Table A3.

The integration of temporal interactions into the model largely confirms the initial conclusions while revealing significant nuances regarding the influence of time on certain determinants of debt financing for family SMEs. Profitability (ROA) continues to have a significant negative impact on the overall debt and short-term debt, as initially observed. However, the interactions reveal that its influence on long-term debt has become increasingly negative over time, suggesting that profitability plays a growing role in reducing long-term financing needs under changing economic conditions. The relationship between growth and debt financing remains stable, with expanding firms consistently relying more on debt, unaffected by temporal variations. Tangibility continues to positively influence long-term debt, reflecting the stable role of tangible assets as collateral. Liquidity retains its

negative impact on debt, but its effect intensifies in certain years, indicating that firms with greater liquidity may have adjusted their debt financing strategies in response to economic fluctuations. Other determinants, such as non-debt tax shields, size, and age, maintain their initial relationships with debt financing, with only minor temporal variations being observed. Overall, while the core findings remain consistent, the addition of interactions reveals significant temporal dynamics, particularly for profitability and liquidity, highlighting the evolving impact of macroeconomic conditions on debt decisions in family SMEs.

6.2. Managerial Implication

The findings of this study highlight important implications for policymakers and banking stakeholders, particularly in bank-based economies where debt serves as the primary financing option for SMEs. Family SMEs, characterized by a heightened sensitivity to control and risk, require financing programs that preserve their independence and decision-making autonomy. While debt financing can enable these firms to pursue growth opportunities, their conservative borrowing behavior often limits their expansion compared to non-family SMEs. This cautious approach stems from their desire to minimize bankruptcy costs and financial risks, which can threaten the firm's future and harm the family's reputation. Consequently, adapted financing strategies are essential to address the unique needs of family SMEs while supporting their growth.

Furthermore, policymakers are encouraged to enhance existing guarantee programs, such as Intelaka, to provide financing solutions that allow both family and non-family SMEs to access debt financing without requiring substantial collateral. Additionally, SME managers should focus on improving their communication with external stakeholders and cultivating stronger relationships with banks and financial institutions. Such measures will help reduce information asymmetry, thereby facilitating improved access to financing and reducing associated costs.

6.3. Research Limitations and Future Research Perspectives

This research, however, presents certain limitations that warrant acknowledgment. First, the study period coincides with the COVID-19 crisis, which may have influenced the debt financing behaviors of Moroccan firms. During such periods, monetary policies and financial systems often adapt to help businesses navigate economic disruptions (Cortes et al., 2022a), which may lead to particular debt levels compared to normal circumstances. As a result, the findings should be interpreted with caution. Additionally, the research sample size is relatively small, limiting the generalizability of the results to broader contexts. This limitation arises from data availability challenges, as no comprehensive database in Morocco provides accurate financial statements or ownership information for SMEs. Consequently, conducting studies on larger samples remains difficult. Nevertheless, the study comprises 1000 firm-year observations (n = 200, t = 5), supporting the robustness of the empirical analysis as the sample size is largely consistent with the rule of thumb of at least 10 observations per predictor (Maxwell, 2000).

Furthermore, the study primarily focuses on the economic determinants of debt financing among family SMEs. Consequently, other potentially influential variables, such as the CEO's tenure, gender, family characteristics, and managerial characteristics, are not included in the analysis, despite their relevance for debt financing policymaking.

Despite these limitations, the research provides a foundation for future empirical studies within the Moroccan and broader Arab contexts and offers valuable insights into corporate finance practices in Moroccan family SMEs. We encourage future studies to explore family-related variables, such as family culture, identification with the firm, socioemotional wealth (SEW), and Islamic religiosity, to provide a comprehensive understanding

of the debt financing behaviors of family SMEs in North African and Arab countries, thereby advancing the ongoing scholarly discourse on the complexities of debt financing in these contexts.

7. Conclusions

This study aimed to examine the firm-level determinants of debt financing decisions among Moroccan family SMEs. Utilizing panel data from 200 SMEs spanning 2018 to 2022, the research employed a comparative analysis to explore the unique financing behaviors of family SMEs in contrast to their non-family counterparts.

Through a comprehensive set of statistical tests and analyses, the study identified several key determinants influencing debt financing within the context of family SMEs. Firstly, family SMEs were found to maintain lower levels of indebtedness compared to non-family SMEs, reflecting a tendency toward risk aversion. Profitability emerged as a significant factor, with profitable family SMEs demonstrating a preference for internal financing, thereby reducing their reliance on debt. This behavior was reinforced by the negative association between liquidity and debt financing, further highlighting the inclination of family SMEs to prioritize internal funds.

Growth opportunities, however, had a positive impact on debt financing for family SMEs, suggesting that these firms turned to external financing when pursuing expansion. Asset tangibility demonstrated contrasting effects, positively influencing long-term debt while negatively impacting the debt-to-equity ratio. This suggested that family SMEs utilized their tangible assets as collateral to secure favorable access to long-term financing. However, despite the advantages tangibility provided for external financing, family SMEs prioritized financial independence and flexibility. They remained cautious about their overall financial structure, avoiding excessive reliance on debt to maintain control and minimize financial risks. Non-debt tax shields had inconsistent effects, significantly reducing the debt-to-equity ratio but showing no significant impact on other debt measures. This suggested that family SMEs appeared to utilize NDTS as a substitute for debt-related tax benefits, reinforcing their conservative financing strategies and aversion to risk. Firm size was positively associated with increased debt financing, while firm age was found to reduce reliance on debt. Overall, the findings suggested that the financing behaviors of Moroccan family SMEs aligned more closely with pecking order theory than with trade-off theory. Furthermore, the comparative analysis between family and non-family SMEs revealed subtle differences in financing behaviors. Specifically, family SMEs exhibited a more conservative approach driven by their focus on maintaining control and minimizing financial risk. This distinction was evident in the differing effects of profitability, NDTS, firm size, and debt level characteristics across the two groups.

This study made several significant contributions to the literature. Firstly, it enhanced the existing literature on corporate finance within family firms, particularly family SMEs, addressing a gap in research on financing decisions in developing economies. Secondly, it provided empirical evidence on the applicability of classical capital structure theories in explaining the financing behavior of Moroccan unlisted SMEs. These theories, which were originally conceived for developed markets, were shown to have relevance in emerging and less-developed contexts, offering valuable insights for policymakers and practitioners in similar environments.

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Appendix A. Tests for Selecting Estimation Technique

Table A1. Tests for selecting estimation technique.

Panel 1: All Sample Firms		
TD		
Hausman test	Chi-square test value: 69.629	*p*-value: 0
Breusch and Pagan Lagrangian multiplier test	chibar2(01) = 946.48	Prob > chibar2 = 0.0000
Modified Wald test for groupwise heteroskedasticity	chi2 (200) = 4.4×10^6	Prob > chi2 = 0.0000
STD		
Hausman test	chi2 = 77.81	Prob > chi2 = 0.0000
Breusch and Pagan Lagrangian multiplier test	chibar2 = 879.83	Prob > chibar2 = 0.0000
Modified Wald test for groupwise heteroskedasticity	chi2 = 3.4×10^6	Prob > chi2 = 0.0000
LTD		
Hausman test	chi2 = 5.37	Prob > chi2 = 0.8653
Breusch and Pagan Lagrangian multiplier test	chibar2 = 1102.04	Prob > chibar2 = 0.0000
Breusch-Pagan/Cook-Weisberg test for heteroskedasticity	chi2 = 833.33	Prob > chi2 = 0.0000
DER		
Hausman test	chi2 = 35.29	Prob > chi2 = 0.0001
Breusch and Pagan Lagrangian multiplier test	chibar2 = 219.56	Prob > chibar2 = 0.0000
Modified Wald test for groupwise heteroskedasticity	chi2 (200) = 4.9×10^7	Prob > chi2 = 0.0000
Panel 2: Family SMEs		
TD		
Hausman test	chi2 =84.75	Prob > chi2 = 0.0000
Breusch and Pagan Lagrangian multiplier test	chibar2 = 531.40	Prob > chibar2 = 0.0000
Modified Wald test for groupwise heteroskedasticity	chi2 (110) = 5.5×10^6	Prob > chi2 = 0.0000
STD		
Hausman test	chi2 = 55.43	Prob > chi2 = 0.0000
Breusch and Pagan Lagrangian multiplier test	chibar2 = 446.92	Prob > chibar2 = 0.0000
Modified Wald test for groupwise heteroskedasticity	chi2 (110) = 1.6×10^5	Prob > chi2 = 0.0000
LTD		
Hausman test	chi2 = 5.81	Prob > chi2 = 0.8309
Breusch and Pagan Lagrangian multiplier test	chibar2 = 603.38	Prob > chibar2 = 0.0000
Breusch–Pagan/Cook–Weisberg test for heteroskedasticity	chi2(1) = 156.80	Prob > chi2 = 0.0000
DER		
Hausman test	chi2 = 61.87	Prob > chi2 = 0.0000

Table A1. *Cont.*

Panel 1: All Sample Firms		
Breusch and Pagan Lagrangian multiplier test	chibar2 = 544.85	Prob > chibar2 = 0.0000
Modified Wald test for groupwise heteroskedasticity	chi2 (110) = 2.1×10^6	Prob > chi2 = 0.0000
Panel 3: Non-family SMEs		
TD		
Hausman test	chi2 = 45.45	Prob > chi2 = 0.0000
Breusch and Pagan Lagrangian multiplier test	chibar2 = 361.88	Prob > chibar2 = 0.0000
Modified Wald test for groupwise heteroskedasticity	chi2 (90) = 6.8×10^5	Prob > chi2 = 0.0000
STD		
Hausman test	chi2 = 54.45	Prob > chi2 = 0.0000
Breusch and Pagan Lagrangian multiplier test	chibar2 = 366.56	Prob > chibar2 = 0.0000
Modified Wald test for groupwise heteroskedasticity	chi2 (90) = 1.9×10^5	Prob > chi2 = 0.0000
LTD		
Hausman test	chi2 = 11.16	Prob > chi2 = 0.3451
Breusch and Pagan Lagrangian multiplier test	chibar2 = 439.16	Prob > chibar2 = 0.0000
Breusch–Pagan/Cook–Weisberg test for heteroskedasticity	chi2 = 587.10	Prob > chi2 = 0.0000
DER		
Hausman test	chi2 = 23.83	Prob > chi2 = 0.0081
Breusch and Pagan Lagrangian multiplier test	chibar2 = 48.32	Prob > chibar2 = 0.0000
Breusch–Pagan/Cook–Weisberg test for heteroskedasticity	chi2 (90) = 1.6×10^6	Prob > chi2 = 0.0000

Source: Authors' own calculations.

Table A2. VIF test results.

	VIF	**1/VIF**
TANG	1.549	0.646
NDTS	1.523	0.657
Size	1.053	0.95
Age	1.052	0.95
LIQ	1.048	0.955
Growth	1.045	0.957
ROA	1.04	0.962
Mean VIF	1.187	

Source: Authors' own calculations.

Table A3. Impacts of firm-level determinants and temporal interactions on debt financing for family SMEs.

Variables	**TD**	**STD**	**LTD**	**DER**
ROA	−0.227	−0.620 ***	0.352 ***	−6.687 ***
	(0.198)	(0.201)	(0.125)	(2.483)
Growth	0.041 *	0.050 *	−0.008	0.437
	(0.023)	(0.027)	(0.012)	(0.306)
TANG	0.070	−0.138	0.159 **	−2.239
	(0.135)	(0.170)	(0.080)	(1.570)
LIQ	−0.011 ***	−0.011 ***	0.000	−0.031 *
	(0.004)	(0.004)	(0.001)	(0.018)
NDTS	−0.549	−0.702	0.235	−8.646 *
	(0.366)	(0.526)	(0.369)	(4.383)

Table A3. *Cont.*

Variables	TD	STD	LTD	DER
Size	0.147 ***	0.117 ***	0.025 **	1.055 ***
	(0.014)	(0.019)	(0.010)	(0.363)
Age	−0.006	−0.048	−0.002 **	−0.171
	(0.028)	(0.032)	(0.001)	(0.430)
ROA temporal effect (Interaction with year t)				
2018	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
2019	−0.164	0.156	−0.316 **	−1.933
	(0.230)	(0.245)	(0.125)	(2.532)
2020	−0.137	0.317	−0.434 ***	−0.634
	(0.279)	(0.255)	(0.150)	(2.415)
2021	−0.476 **	0.257	−0.694 ***	−2.594
	(0.221)	(0.219)	(0.125)	(2.472)
2022	−0.550 **	−0.007	−0.508 ***	−7.721 **
	(0.217)	(0.257)	(0.158)	(3.243)
Growth opportunities temporal effect (Interaction with year t)				
2018	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
2019	−0.013	−0.044	0.025	0.026
	(0.043)	(0.051)	(0.020)	(0.656)
2020	−0.017	−0.021	0.005	0.378
	(0.024)	(0.028)	(0.013)	(0.281)
2021	−0.052	−0.061	0.019	−0.457
	(0.039)	(0.049)	(0.029)	(1.049)
2022	−0.029	−0.041	0.017	−0.229
	(0.036)	(0.042)	(0.020)	(0.482)
Tangibility temporal effect (Interaction with year t)				
2018	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
2019	−0.049	−0.101	0.052	−0.856
	(0.067)	(0.077)	(0.042)	(0.788)
2020	0.010	−0.043	0.056	−0.058
	(0.091)	(0.080)	(0.054)	(0.864)
2021	−0.065	−0.061	0.010	−0.009
	(0.096)	(0.089)	(0.050)	(1.525)
2022	0.070	−0.019	0.089	1.233
	(0.158)	(0.139)	(0.091)	(1.257)
Liquidity temporal effect (Interaction with year t)				
2018	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
2019	−0.021	−0.032 *	0.011 **	−0.192 *
	(0.013)	(0.017)	(0.005)	(0.115)
2020	0.000	−0.001	0.001	−0.035
	(0.005)	(0.005)	(0.001)	(0.031)
2021	−0.015 *	−0.017 **	0.003	−0.275 **
	(0.008)	(0.007)	(0.005)	(0.126)
2022	−0.000	−0.001	0.000	0.044 *
	(0.005)	(0.004)	(0.001)	(0.022)
NDTS temporal effect (Interaction with year t)				
2018	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
2019	−0.266	0.356	−0.639	4.078
	(0.300)	(0.347)	(0.409)	(2.601)
2020	−0.399	0.343	−0.778 *	−1.710
	(0.748)	(0.570)	(0.411)	(5.388)
2021	0.224	0.445	−0.293	−4.931
	(0.436)	(0.465)	(0.352)	(7.032)
2022	0.067	0.936	−0.882 **	−0.333
	(0.646)	(0.645)	(0.445)	(7.980)

Table A3. *Cont.*

Variables	TD	STD	LTD	DER
	Size temporal effect (Interaction with year t)			
2018	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
2019	−0.003	0.007	−0.011	−0.235
	(0.009)	(0.010)	(0.007)	(0.150)
2020	−0.015	−0.008	−0.008	−0.258
	(0.014)	(0.014)	(0.009)	(0.157)
2021	−0.013	0.002	−0.014	−0.207
	(0.012)	(0.012)	(0.009)	(0.196)
2022	−0.003	0.012	−0.015	−0.041
	(0.014)	(0.015)	(0.009)	(0.207)
	Age temporal effect (Interaction with year t)			
2018	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
2019	0.000	−0.000	0.000 *	−0.003
	(0.000)	(0.000)	(0.000)	(0.006)
2020	0.000	0.000	0.000	0.006
	(0.001)	(0.001)	(0.001)	(0.007)
2021	0.000	0.000	0.000	0.010
	(0.001)	(0.001)	(0.001)	(0.015)
2022	0.001	0.000	0.001	0.023 *
	(0.001)	(0.001)	(0.001)	(0.013)
	Year effect and temporal effect (Interaction with year t)			
2019	0.063	0.042	0.072	2.384
	(0.080)	(0.081)	(0.061)	(1.479)
2020	0.097	0.060	0.133	1.842
	(0.101)	(0.097)	(0.082)	(1.138)
2021	0.110	0.055	0.177 **	2.268
	(0.080)	(0.079)	(0.077)	(1.520)
2022	-	-	0.174 **	-
			(0.082)	
Industry effect	YES	YES	YES	YES
Constant	−0.391	0.675	−0.135	−1.543
	(0.561)	(0.690)	(0.102)	(7.873)
Observations	550	550	550	550
R-squared	0.602	0.552		0.312

Note. *** $p < 0.01$, ** $p < 0.05$, * $p < 0$. **Source**: Authors' own calculations.

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