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Profitability and Leverage in Family-Managed and Non-Family Firms[1]

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Rentabilidad y endeudamiento en empresas con gestión familiar y no familiar
Rentabilidade e endividamento em empresas de gestão familiar e não familiares

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The study examined the influence of profitability on the capital structure of Brazilian firms with both family and non-family management. The sample included 191 companies analyzed between 2011 and 2024 using the Generalized Method of Moments (GMM) System. The results indicate that Brazilian firms tend to reduce their debt levels as they become more profitable. However, the findings also suggest that family management does not intensify this relationship. This study contributes to the literature by demonstrating that higher profitability encourages managers to reduce debt, regardless of whether the firm is family-run or not.

El estudio analizó la influencia de la rentabilidad en la estructura de capital de las empresas brasileñas con y sin gestión familiar. La muestra estuvo compuesta por 191 empresas entre 2011 y 2024, analizadas mediante el método generalizado de momentos (GMM) en sistema. Los resultados indican que las empresas brasileñas tienden a reducir su nivel de endeudamiento a medida que aumentan su rentabilidad. Sin embargo, los hallazgos también sugieren que la gestión familiar no intensifica esta relación. Este estudio contribuye a la literatura al evidenciar que el aumento de la rentabilidad incentiva a los gestores a reducir el endeudamiento, independientemente de si la empresa es de gestión familiar o no.

O estudo analisou a influência da rentabilidade na estrutura de capital das empresas brasileiras com gestão familiar e não familiar. A amostra foi composta por 191 empresas entre 2011 e 2024 analisadas por meio de Generalized Method of Moments (GMM) System. Os resultados indicam que as empresas brasileiras tendem a reduzir o endividamento à medida que se tornam mais rentáveis. Contudo, os resultados indicam que a gestão familiar não é capaz de intensificar essa relação. O estudo contribui ao evidenciar que o aumento da rentabilidade incentiva gestores a reduzir o endividamento, independentemente de a empresa ter gestão familiar ou não.

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1. Introduction

Capital structure is one of the core topics in corporate finance (Harris & Raviv, 1991) and has been analyzed through the lens of the Trade-off and Pecking Order Theories. The Trade-off Theory helps explain the existence of an optimal capital structure, which is determined by balancing the costs and benefits of debt (Myers, 1984). According to this theory, firms seek a structure that optimally balances the advantages and disadvantages of leverage (Silveira et al., 2008; Esghaier, 2024). In contrast, the Pecking Order Theory moves away from the notion of an optimal capital structure and instead describes the hierarchy firms follow in corporate financing decisions. This theory suggests that firms prioritize internal financing through retained earnings over external sources of funding (Myers & Majluf, 1984).

Both theories offer distinct perspectives on the relationship between capital structure and firm profitability. From the Trade-off Theory perspective, more profitable firms tend to have higher leverage. In contrast, the Pecking Order Theory argues that higher profitability reduces debt levels, as more profitable firms prefer to finance their capital through retained earnings. Previous studies have examined the influence of capital structure on firm profitability from the standpoint of these two theories. Correa et al. (2013), Javed et al. (2014), Mardones and Cuneo (2019), Nguyen and Nguyen (2020), Ayaz et al. (2021), and Oanh et al. (2023) supported the Trade-off Theory, demonstrating that corporate financing decisions positively affect firm profitability—meaning that firms experience increased profitability when leverage is maintained at an optimal level. However, under the Pecking Order perspective, Nassar (2016) Le and Phan (2017), and Ronoowah and Seetanah (2024) found that in developing markets, capital structure has a negative effect on profitability. Thus, when managers must decide which source of financing to prioritize, internal funding has been the preferred choice.

Conflicting evidence regarding the impact of leverage on profitability arises from specific demographic and firm-level characteristics (Mardones & Cuneo, 2019; Pamplona et al., 2017). Emerging economies generally exhibit higher interest rates and greater economic instability compared to developed economies (Schwarz & Dalmácio, 2021; Sousa et al., 2022; World Bank, 2021). Additionally, capital markets in emerging countries tend to be highly concentrated (Monteiro et al., 2019; Quiraque et al., 2021). These factors influence, for instance, borrowing costs and increase managerial reluctance to rely on external financing (Duran & Stephen, 2020). As a result, companies in emerging economies tend to favor internal resources over debt financing (Pamplona et al., 2017). Thus, in emerging markets, the Pecking Order Theory better explains firms' financial behavior.

Previous studies have demonstrated the existence of an inverse relationship between leverage and profitability (Javed et al., 2014; Khémiri & Noubbigh, 2018; Nguyen & Nguyen, 2020; Ronoowah & Seetanah, 2024; Sutomo et al., 2020), including firms operating in Brazil (Pamplona et al., 2017; Mardones & Cuneo, 2019). Beyond these factors, family management could further strengthen this relationship. This is because family-owned firms are generally more risk-averse and seek to ensure the continuity of management within family members (Pestana et al., 2021).

KEYWORDS
Family management; return on assets; total debt.

PALABRAS CLAVE
Endeudamiento general; gestión familiar; rentabilidad sobre el activo.

PALAVRAS-CHAVE
Endividamento geral; gestão familiar; rentabilidade sobre o ativo.

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Although the literature indicates that family-managed firms have greater access to external funding compared to non-family firms (Csákné & Karmazin, 2016; Gottardo & Moisello, 2014; Pestana et al. 2021; Viera, 2014), they tend to finance their capital through retained earnings (Ampenberger et al., 2013; Mehboob, Tahir & Hussain, 2015; Mohamadi, 2012). This aversion to leverage during periods of high profitability is explained by the concern that family members may struggle to meet debt obligations (Gega et al., 2025; Monteiro et al., 2019), which could lead to new equity issuances and, consequently, a reduction in the family's ownership stake.

It is worth noting that many loans are subject to covenants, which, if breached, allow financial institutions to demand early debt repayment (Platikanova, 2017). Furthermore, failure to meet debt obligations may lead to shareholder disputes regarding the family's continued control over the company, potentially reducing the founding family's influence within the firm. In this context, family management can be a specific corporate factor that strengthens the negative relationship between profitability and leverage.

Although Brazil is the largest economy in Latin America, it has relatively high interest rates (World Bank, 2021), which is why the Pecking Order Theory better explains the relationship between leverage and profitability (Pamplona et al., 2017; Mardones & Cuneo, 2019). Another relevant aspect is that many companies belong to family groups and have family members in key executive positions. Given this context, the empirical study aims to analyze the influence of profitability on the capital structure of Brazilian firms with both family and non-family management.

This research is innovative as it focuses on the reverse causality between profitability and leverage. A considerable number of studies investigate the impact of leverage on profitability. However, according to Margaritis and Psillaki (2010), this represents only one side of the relationship. When firms experience variations in profitability due to changes in their capital structure—whether through an increase or decrease in debt financing—these changes may influence the capital structure configuration in future periods. Another important aspect is that previous studies tend to analyze firms across the entire market without considering specific management characteristics that may affect the relationship between profitability and leverage.

To achieve the study's objective, a sample of non-financial firms listed in Brazil was analyzed. The necessary information was collected from the Reference Form and the Refinitiv® database, considering annual periods from 2011 to 2024, and was processed using the Generalized Method of Moments (GMM) System. The results indicate that firms tend to significantly reduce their level of leverage as their return on assets increases. Additionally, the findings reveal that this relationship does not exhibit a significant difference in intensity when comparing family-managed firms to non-family-managed firms.

This study contributes to the literature and to stakeholders who transact resources with firms by demonstrating that higher profitability serves as a signal for reducing leverage in the same period. In this context, profitability tends to translate into cash flow in the same period, which is then used by managers to reduce debt obligations. This behavior is particularly relevant in Brazil, where debt financing generally entails a higher cost compared to internal funding. Furthermore, the study highlights that the reduction in leverage occurs with similar intensity, regardless of whether the firm is family-managed or not.

2. Development of Hypotheses

Hovakimian et al. (2001) argued that capital structure directly influences firm value. By adjusting their capital structure, firms can move toward a debt target consistent with theories based on trade-offs between the costs and benefits of debt. Similarly, Flannery and Rangan (2006) demonstrated that highly leveraged firms adjust their debt levels toward an optimal leverage ratio.

Prior to the discussions by Hovakimian et al. (2001) and Flannery and Rangan (2006), debates had already emerged regarding theories explaining how companies finance themselves and the resulting implications for firm performance and value. In this context, the Trade-Off Theory (Myers, 1984) and the Pecking Order Theory (Myers, 1984; Myers & Majluf, 1984) were employed. The Trade-Off Theory posits that corporate financing decisions positively impact firm value, requiring managers to balance tax benefits and bankruptcy costs to maximize corporate value. Conversely, the Pecking Order Theory suggests that firms follow a specific financing hierarchy and establishes a negative relationship between profitability and the use of external funds.

Fama and French (2002) confirmed the predictions of the Pecking Order Theory and contradicted the Trade-Off Theory by stating that more profitable firms tend to have lower leverage. They found that firms with higher levels of resources allocated to investments are less indebted, whereas companies with higher profitability and lower resource allocation to investments pay higher dividends. Chauhan and Huseynov (2018) highlighted that corporate financing decisions are primarily driven by deviations from firms' target leverage ratios.

Correa et al. (2013), Khémiri and Noubbigh (2018), Duran and Stephen (2020), and Ronoowah and Seetanah (2024) demonstrated that the Pecking Order Theory is the most consistent in explaining capital structure in countries with high levels of information asymmetry and ownership concentration. Analyzing Brazilian firms, Correa et al. (2013) concluded that managers in this market prioritize profit retention to finance capital. This result is not limited to Brazil, as companies in other emerging economies exhibit similar behavior. Khémiri and Noubbigh (2018), Nguyen and Nguyen (2020), and Sutomo et al. (2020) found that in Sub-Saharan Africa, Indonesia, and Vietnam, the proportion of debt to total assets is inversely related to business performance—that is, more profitable firms tend to have lower leverage.

From the same perspective, Javed et al. (2014) demonstrated that, in Pakistani firms, when deciding on a financing source, managers prioritize profit retention. If internal funds are insufficient, they seek external financing and issue shares. A possible explanation for this behavior is that when profitability is high, managers prefer internal financing, leading to lower debt levels. When profitability is moderate, they opt for a mixed financing approach, combining retained earnings and external debt, which increases the likelihood of higher leverage. Conversely, when profitability is low, firms have fewer opportunities to obtain external debt, resulting in lower leverage ratios (Mardones & Cuneo, 2019). Thus, it is proposed that:

H1: Higher profitability is associated with lower leverage.

Certain company-specific aspects intensify this relationship in emerging markets, particularly characteristics related to top management. When a company's top management includes members of the founding family, there is a greater aversion to using external financial resources to fund the firm's

activities compared to non-family-managed companies (Mishra & McConaughy, 1999; Pestana et al., 2021; Cheng et al., 2024). In other words, the presence of family management makes the logic of the Pecking Order Theory more applicable and more pronounced in family-managed firms.

This aversion to external financing stems from certain concerns among family members, such as maintaining control over management and preserving the family's ownership stake in the company (Monteiro et al., 2019; Cheng et al., 2024). These aspects may be at risk in cases of missed payments or breaches of contractual covenants, as such events could lead to debt acceleration. If sufficient resources are not available, management may be forced to issue new shares, thereby diluting the family's ownership in the company (Platikanova, 2017; Monteiro et al., 2019).

Thus, even though family-managed firms have greater access to external financing and, consequently, tend to exhibit higher debt levels compared to non-family-managed firms (Pestana et al., 2021; Rivera-Franco et al., 2024), they generally prefer internal financing (Ampenberger et al., 2013; Monteiro et al., 2019; Moussa & Elgiziry, 2019; Pamplona et al., 2017; Pamplona et al., 2020). If internal resources are insufficient to meet financing needs, some family members, viewing the company as an asset to be passed on to future generations (Hillen & Lavarda, 2020), reallocate their personal resources to achieve corporate objectives while avoiding or minimizing the use of external capital (Csákné & Karmazin, 2016). Accordingly, the following hypothesis is proposed:

> *H2: In family-managed firms, the inverse relationship between profitability and leverage is more pronounced than in non-family firms.*

3. Methodology

The sample consists of non-financial firms listed on B3 – Brasil, Bolsa, Balcão during the 2011–2024 period. Annual data were used since the composition of a company's management can be mapped yearly through the Reference Form (Formulário de Referência). The initial sample included 376 firms. However, to define the final sample, specific selection criteria was applied. The criterion involved excluding firms that did not have at least 50% of the observations for the period analyzed. In other words, only firms with complete data for at least seven (7) years were included, which resulted in the exclusion of 185 companies.

Table 1 presents details on the selection process and the final sample composition.

Table 1 - Final Sample Selection

(=) Companies listed on B3	376
(-) Companies with less than 50% of complete observations	185
(=) Companies included in the final sample	191

Note: Each company has only one stock code listed on B3; therefore, no company appears twice in the dataset. Additionally, companies with negative shareholders' equity in any period were excluded from the sample

The final sample consisted of 2,606 firm-year observations of the 191 companies, which were subjected to a winsorization procedure with cutoff points at the 1st and 99th percentiles. Economic and financial data were collected from the Refinitiv Eikon® database, while information on family management was obtained from the Reference Form.

To characterize family ownership, the methodology proposed by Shyu (2011) was applied, which defines a publicly traded company as family-owned if at least 10% of its voting shares are held by members of the same family. Family management was determined based on the procedures described by Villalonga and Amit (2006), which assess whether: (i) the company's CEO is a member of the owning family(ies); (ii) members of the owning family(ies) hold executive senior management positions; and (iii) members of the owning family(ies) serve as the chairperson or board advisors.

Table 2 presents details on the variables used in the study, which are categorized as dependent, key independent, and control independent variables.

Table 2 - Research Variables

Dependent Variable			
Variable		*Measurement*	*References*
Leverage (LEV)		(Total Debt$_{it}$ / Total Assetsit) * 100	Myers and Majluf (1984), Myers (1984), Quiraque et al. (2021) and Schwarz and Dalmácio (2021)
Key Independent Variable			
Variable	*Relational Logic*	*Measurement*	*References*
Return on Assets (ROA)	The increase in profitability in the period implies a reduction in debt.	(Net Income$_{it}$ / Total Assetsit) * 100	González et al. (2013)
Family Management (FM)	In family-managed companies, increased profitability would further reduce leverage levels.	Dichotomous variable where: (1) company led by family management; (0) company led by non-family management	Villalonga and Amit (2006), and Shyu (2011)
Control Independent Variables			
Variable	*Relational Logic*	*Measurement*	*References*
Market to Book (MB)	Companies with higher market-to-book ratios tend to have higher levels of overall leverage.	Market Value$_{it}$ / Total Equityit	Sarlo Neto, Bassi & Almeida (2011)
Current Liquidity (CL)	An increase in current liquidity is negatively related to overall leverage.	Current Assets$_{it}$ / Current Liabilitie$_{it}$	Correa et al. (2013), Henrique et al. (2018)
Revenue Growth (RGROW)	Revenue growth is associated with a reduction in overall leverage.	((Sales Revenue$_{it}$ / Sales Revenue$_{it-1}$) - 1) * 100	Kayo and Famá (1997), and Henrique et al. (2018)
Size (SIZE)	Larger companies tend to have higher levels of overall leverage.	Natural logarithm of total assets	Brito, Corrar & Batistella (2007), Correa et al. (2013)
Annual Period	Leverage levels may change over time due to company strategies and macroeconomic conditions. Therefore, annual period control variables account for this leverage volatility over time.	Dummy variables where each year is represented by a variable. The year 2011 was considered the reference variable.	Teixeira, Nossa & Funchal (2011)

To test the proposed hypotheses, an econometric model was developed, as presented in **Equation 1**. To test the second hypothesis, the sample was divided into companies with non-family management and those with family management. Additionally, the second hypothesis was evaluated through a second econometric model that examines the interaction between the return on assets variable and the dichotomous variable indicating the type of management (family or non-family) leading the company's top management.

$$LEV_{it} = \beta_0 + \beta_1 LEV_{t-1} + \beta_2 ROA_{it} + \beta_3 MB_{it} + \beta_4 CL_{it} + \beta_5 RGROW_{it} + \beta_6 SIZE_{it} + \sum_{t=2}^{11} \varphi Year + \varepsilon_{it} \quad (1)$$

$$LEV_{it} = \beta_0 + \beta_1 LEV_{t-1} + \beta_2 ROA_{it} + \beta_3 ROA_{it} * FM_{it} + \beta_4 MB_{it} + \beta_5 CL_{it} + \beta_6 RGROW_{it} + \beta_7 SIZE_{it} + \sum_{t=2}^{11} \varphi Year + \varepsilon_{it}$$

LEV = total debt of company i in period t; *ROA* = return on assets of company i in period t; *FM* = family management of company i in period t; *MB* = market-to-book ratio of company i in period t; *CL* = current liquidity of company i in period t; *RGROW* = revenue growth of company i in period t; *SIZE* = size of company i in period t; *Ano* = annual period control through dummy variables, considering the year 2011 as the reference.

For the regression estimation, the Generalized Method of Moments (GMM) was chosen, specifically in its GMM System configuration. This model applies first-difference estimation as a means to mitigate issues related to endogeneity (Heckman, 1979; Arellano & Bover, 1995; Blundell & Bond, 1998). Additionally, tests were conducted to assess the goodness-of-fit of the GMM System regression at a 5% significance level, considering first-order serial autocorrelation AR(1) and second-order serial autocorrelation AR(2), as well as validating the instruments used through the Hansen test.

4. Results

The analyzed variables were segmented into three groups: observations from the full sample, observations from firms with family management, and observations from firms without family management, as presented in **Table 3**.

Table 3 - Descriptive Statistics

Variables		*Mean*	*Standard Deviation*			*Minimum*	*Maximum*	*Obs*
			O	*B*	*W*			
LEV	Total	32.701	24.086	20.441	12.942	0.000	140.311	2606
	ROA	33.299	23.044	20.606	10.935	0.000	140.311	1206
	MB	32.186	24.946	20.385	14.453	0.000	140.311	1400

ROA	Total	1.207	14.592	8.760	11.846	-81.494	36.147	2606
	RGROW	2.991	10.073	5.169	8.659	-81.494	36.147	1206
	SIZE	-0.330	17.434	10.672	14.026	-81.494	36.147	1400
MB	Total	1.859	2.951	1.762	2.366	-6.018	18.753	2606
	Family-Managed	1.923	2.879	1.636	2.371	-6.018	18.753	1206
	Non-Family-Managed	1.805	3.012	1.867	2.362	-6.018	18.753	1400
CL	Total	1.898	1.694	1.376	0.988	0.101	11.953	2606
	Family-Managed	2.195	1.748	1.529	0.851	0.101	11.953	1206
	Non-Family-Managed	1.642	1.603	1.183	1.092	0.101	11.953	1400
RGROW	Total	10.634	36.709	10.971	35.202	-89.207	217.471	2606
	Family-Managed	10.292	29.439	8.644	28.171	-89.207	217.471	1206
	Non-Family-Managed	10.930	41.982	12.634	40.298	-89.207	217.471	1400
SIZE	Total	21.901	1.892	1.848	0.464	17.018	26.322	2606
	Family-Managed	21.796	1.792	1.745	0.450	17.646	26.061	1206
	Non-Family-Managed	21.991	1.970	1.936	0.475	17.018	26.322	1400

Note: O = Overall; B = Between; W = Within; Obs. = Observations.

The results indicate that the average debt level of family-managed firms is higher than that of non-family-managed firms in the sample. Specifically, family-managed firms exhibit an average debt level of 33.30%, whereas non-family-managed firms report an average total debt of 32.19%. The return on assets shows an overall mean of 1.21%, with family-managed firms achieving an average of 2.99% and non-family-managed firms reporting -0.33%. Furthermore, the findings reveal that 88 firms were consistently managed by family members throughout the period, 104 firms were led by non-family executives, and 1 firm experienced a mixed management structure, with part of the period under family management and the remaining time under non-family leadership.

Complementary to the descriptive analysis, the study's key variables were subjected to the Mann–Whitney U test test at a 5% significance level to determine whether there were significant differences in the debt level and return on assets between family-managed and non-family-managed firms. The results indicate that the level of debt does is significantly differ between non-family-managed and family-managed firms ($Z = -2.757$; p-value < 0.005), although the data reveal that family-managed firms tend to exhibit higher average levels of debt. Similarly, the findings suggest that firms with family members in executive management exhibit higher return on assets levels ($Z = -3.287$; p-value = 0.001) compared to non-family-managed companies.

Subsequently, the results were subjected to a Generalized Method of Moments (GMM) regression using the two-step System approach at a 5% significance level. This multivariate estimation was conducted with robust standard errors to mitigate potential issues related to heteroskedasticity in the residuals. The validation tests for the four multivariate models indicated the presence of only first-order serial autocorrelation at a 5% significance level, confirming the suitability of these models within the GMM System framework (Arellano & Bover, 1995; Blundell & Bond, 1998). Furthermore, the Hansen test was not statistically significant at the 5% level, demonstrating that the instruments employed adequately control for endogeneity-related issues.

Table 4 presents the results of the multivariate regressions, aimed at assessing the effects of return on assets on the debt level of family and non-family firms.

Table 4 - Multivariate Models

Variable	*All Firms*	*Family-Managed Firms*	*Non-Family Firms*	*All Firms*
	Model 1	*Model 2*	*Model 3*	*Model 4*
	Coefficient (Std. Error)	*Coefficient* (Std. Error)	*Coefficient* (Std. Error)	*Coefficient* (Std. Error)
LEV_{t-1}	0.8781***	0.8489***	0.8497***	0.8889***
	(0.0476)	(0.1072)	(0.0535)	(0.0469)
ROA	-0.2500***	-0.3189**	-0.2202***	-0.2521***
	(0.0443)	(0.1524)	(0.0441)	(0.0814)
*ROA*FM*				0.0184
				(0.2633)
MB	0.2720***	0.2431**	0.2065*	0.2677***
	(0.0862)	(0.1098)	(0.1220)	(0.0872)
CL	-0.1507	-0.0921	-0.2275	-0.0927
	(0.2346)	(0.3890)	(0.2813)	(0.2755)
RGOW	-0.0077	-0.0025	-0.0077	-0.0093
	(0.0075)	(0.0140)	(0.0094)	(0.0077)
SIZE	0.7824***	0.9524**	0.6140**	0.7286***
	(0.2172)	(0.4168)	(0.2565)	(0.2342)
Constant	-10.5136**	-12.7480**	-65.691	-9.6442**
	-41.733	-60.805	-54.235	-47.483
Year Fixed Effects	Yes	Yes	Yes	Yes
Wald Test	1,671.55***	3,926.66***	738.68***	1,617.49***
Observations	2,606	1,206	1,400	2,606
AR (1) (p-value)	-3.81(0.000)	-2.43(0.015)	-3.05(0.002)	-3.84(0.000)
AR (2) (p-value)	-1.73(0.083)	-1.12(0.263)	-1.39(0.164)	-1.78(0.076)
Hansen Test (p-value)	10.59(0.645)	15.10(0.301)	10.03(0.692)	10.29(0.670)

The findings from Model 1 suggest that return on assets is negatively associated (Coef. = -0.2499; p-value < 0.000) with the level of debt. This result indicates that companies in the Brazilian capital market reduce their debt levels as they become more profitable. Furthermore, it is noteworthy that the reduction in debt driven by increased profitability occurs in both family-managed firms (Model 2 – Coef. = -0.3189; p-value < 0.000) and non-family firms (Model 3 – Coef. = -0.2202; p-value < 0.000). Thus, the results from Models 2 and 3 suggest that, regardless of the type of management leading the company, when firms become more profitable, management adopts measures aimed at reducing their debt levels.

Despite these results, it is important to highlight that the intensity of the effect of profitability on debt reduction could vary depending on the type of management leading the company. In other words, family-

managed firms and non-family firms might experience different levels of impact. To assess this potential effect, Model 4 was estimated, incorporating an interactive variable formed by the multiplication of return on assets and family management—a variable that indicates whether a company is managed by family members. The results from Model 4 show that the interaction term between return on assets and family management is not statistically significant (Coef. = 0.0184; p-value < 0.944). This finding suggests that family-managed firms do not exhibit a different intensity in the ability of profitability to reduce debt levels when compared to non-family firms.

5. Discussion of Results

The descriptive results indicate that firms with family members in top executive positions do not exhibit differences in third-party debt levels compared to firms managed by non-family executives. This finding complements the discussion by Monteiro et al. (2019), as although non-family-managed firms tend to be more prone to debt financing than family-managed firms, family management itself does not necessarily lead to lower third-party debt levels compared to firms without this type of management.

The results of the first multivariate regression model indicate that an increase in profitability leads companies to reduce third-party debt. This evidence does not reject the first research hypothesis (H1) and aligns with the Pecking Order Theory, which posits an inverse relationship between debt and profitability. Moreover, it complements the discussions by Correa et al. (2013), Pamplona et al. (2017), Khémiri and Noubbigh (2018), Duran and Stephen (2020), and Ronoowah and Seetanah (2024). Thus, the findings suggest that publicly traded Brazilian companies experiencing increased profitability implement actions aimed at reducing debt levels in the same period, thereby maximizing firm performance. This effect occurs because lower debt levels lead to a reduction in financial expenses and interest payments to financial institutions.

Some reasons behind this inverse relationship between profitability and overall debt reduction may stem from specific characteristics of the Brazilian market. In Brazil, interest rates on loans tend to be significantly higher compared to those in European and North American countries. This factor may explain the inverse relationship between profitability and debt levels in Brazilian firms, whereas, in European companies, more profitable firms tend to have higher debt levels, as found by Pamplona et al. (2017). Thus, the findings suggest that companies experiencing increased profitability tend to rely more on internal resources to finance their future activities, driven by higher cash inflows.

Although profitability drives debt reduction, certain organizational characteristics may amplify this relationship. One key factor is the composition of the firm's top management. Family-managed firms tend to exhibit greater risk aversion, which could lead them to adopt more conservative financial policies when profitability increases. As a result, these firms might intensify debt reduction efforts more than their non-family-managed counterparts.

This perspective was tested using Model 2, Model 3, and Model 4. The results of Model 2 and Model 3 showed that both family-managed and non-family-managed firms tend to reduce their debt levels as they become more profitable. This finding reinforces the results of Model 1, indicating that Brazilian firms, regardless of their management structure, anticipate reducing their reliance on external financing as their financial performance improves. However, Model 4 revealed that the interactive variable between return on assets and family management was not statistically significant. This suggests that there is no significant difference in the intensity of debt reduction driven by increased profitability, depending on whether the firm is family-managed or not. As a result, the second research hypothesis (H2) was rejected.

The rejection of the second research hypothesis (H2) contrasts with the discussions presented by Mishra and McConaughy (1999), Csákné and Karmazin (2016), Pamplona et al. (2017), Monteiro et al. (2019), Pamplona et al. (2020), and Pestana et al. (2021). These studies argue that family-managed firms tend to be more risk-averse and, consequently, finance their activities more substantially through internal funds rather than external debt. Thus, the findings suggest that in Brazil, there are no substantial differences in the application of the Pecking Order Theory among publicly traded firms based on their management structure. This could be attributed to the higher levels of risk in the Brazilian business environment compared to developed economies, making the use of external financing more costly than relying on internal capital to fund corporate activities.

6. Conclusion

The results indicated that an increase in return on assets is associated with a decrease in overall debt levels. When assessing the role of family management in this relationship, it was found that it does not intensify the negative relationship between return on assets and debt levels.

These findings lead to at least two main reflections. The first reflection is that publicly traded Brazilian companies tend to reduce their debt levels as they achieve higher profitability. This debt reduction occurs within the same period in which the company becomes more profitable, suggesting that the increased profitability is promptly converted into cash flow and used to pay down debt. Additionally, the negative association between return on assets and debt levels aligns with the reasoning of the Pecking Order Theory, which suggests that firms prioritize internal financing over external debt when available.

This association also highlights specific characteristics of the Brazilian market, where corporate managers prefer to finance operations with internal resources rather than external debt. This preference reflects key aspects of the Brazilian macroeconomic environment, especially when compared to developed economies, which have historically maintained low interest rates. Developed economies tend to experience lower economic uncertainty due to more stable economic policies, allowing market agents to make medium- and long-term projections with lower risk. In contrast, Brazil typically has high interest rates, often used as a tool to control inflation. With elevated borrowing costs and an economy with low predictability, the financial expenses associated with loans and financing become less attractive. As a result, Brazilian firms are incentivized to rely more on internal funds to finance their operations.

The second key takeaway is that the inverse relationship between return on assets and debt levels does not differ in intensity based on the type of management—whether family-owned or non-family-owned. This finding contributes to the literature by demonstrating that, in the Brazilian context, even though family-run businesses are typically associated with more conservative financial decision-making, they do not exhibit substantially different debt-reduction strategies as their profitability increases compared to non-family firms. Thus, this study advances the discussion by empirically showing that publicly traded Brazilian firms tend to reduce their debt at a similar intensity when their profitability rises, regardless of whether they are family-run or not.

Regarding the study's limitations, this research only analyzed overall debt, without distinguishing between short- and long-term liabilities. Additionally, it did not differentiate between firms with low and high debt levels, which could reveal variations in financial strategies. Future research could explore these aspects to deepen the understanding of this topic. Another limitation is that, among family-run businesses, the specific roles of family members within the executive structure were not considered, which could influence the strength of the inverse relationship between profitability and debt. Given these constraints, future studies should also examine other characteristics of top management teams that may impact operational decisions, particularly those affecting the relationship between external debt and corporate performance.

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