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## Evidence of Diversification and Leverage in the Performance of Brazilian and Mexican Family Businesses

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### Abstract

This study identifies evidence of the influence of diversification and leverage on the financial performance of Brazilian and Mexican family businesses. It analyzes 102 Brazilian and 71 Mexican publicly traded family companies. Data analysis uses ordinary least squares regression in Stata. The results indicate that Brazilian family businesses have a higher return on assets when diversifying their products or services. When diversifying international markets, Brazilian companies present a lower return on assets and return on equity. For Mexican companies, international diversification derives a higher return on assets and return on equity. In addition, results show that leverage moderates the relationship between diversification and performance both for Brazilian and Mexican family businesses. The study contributes to the current literature by investigating that diversification improves business performance and that leverage is a significant element in intensifying the benefits of this strategy in the performance of family businesses. The study also emphasizes that diversification can be useful to address market difficulties and imperfections in unstable scenarios, such as when it is targeted to planned performance and considers financial conservatism in family companies.

**Keywords:** diversification; leverage; performance; family businesses

### Resumen

Este estudio tiene como objetivo identificar evidencias de la influencia de la diversificación y el apalancamiento en el desempeño financiero de las empresas familiares brasileñas y mexicanas. Analizamos 102 empresas familiares brasileñas y 71 mexicanas que cotizan en bolsa. Para el análisis de los datos se utilizó la regresión *ordinary least squares* en el Stata. Los resultados indican que las empresas familiares brasileñas tienen una mayor rentabilidad sobre los activos cuando diversifican sus productos o servicios. Al diversificar los mercados internacionales, las empresas brasileñas tienen menor retorno sobre los activos y sobre el capital. Para las empresas mexicanas, la diversificación internacional se traduce en mayores rendimientos sobre activos y capital. Además, los resultados muestran que el apalancamiento modera la relación entre diversificación y desempeño para las empresas familiares brasileñas y mexicanas. El estudio contribuye a la literatura actual al investigar el hecho de que la diversificación mejora el desempeño empresarial y que el apalancamiento es un elemento significativo para potenciar los beneficios de esta estrategia sobre el desempeño de las empresas familiares. El estudio también

destaca que la diversificación puede ser útil para enfrentar las dificultades e imperfecciones del mercado en escenarios inestables, buscando el desempeño planificado, dado el aspecto de conservadurismo financiero en las empresas familiares.

**Palabras clave:** diversificación; apalancamiento; desempeño; empresas familiares

Family and nonfamily businesses differ in their strategic decisions (Muñoz-Bullón, Sanchez-Bueno, and Suárez-González 2018). This distinctive behavior is due to loss aversion, which is characteristic of family companies (Gomez-Mejia, Makri, and Kintana 2010), and to family goals and motivations, mainly the meaning that family members attribute to the business (Basco 2017; Pieper 2010).

Among the strategic decisions that can be affected by family influence in business, studies highlight diversification, given that it is a strategic choice that, because it can result in changes to the organization, can compromise the family's socioemotional wealth (SEW) and affect the concentration of family wealth (Gomez-Mejia, Makri, and Kintana 2010). Diversification is understood as company participation in various markets, sectors, industries, or segments in which it was not involved previously (Gemba and Kodama 2001).

In the literature, diversification is strictly associated with performance. However, there is no consensus as to whether diversification has any kind of relationship with the financial performance of companies, positive or negative (Benito-Osorio, Guerras-Martín, and Zúñiga-Vicente 2012; Lee, Hooy, and Hooy 2012). The dominant view finds a positive relationship, as demonstrated in the study of Gyan, Brahmna, and Bakri (2017), who investigated the relationship between diversification (both international and industrial) and performance. They found that industrial diversification makes a significant contribution to improved performance, whereas international diversification does not.

However, Singh, Nejadmalayeri, and Mathur (2007) found a negative relationship when analyzing diversification and corporate performance. Their study observed that diversified companies display worse performance than specialized companies do. This indicates that such a negative impact might result from the nature of business affiliation with multinationals or national companies.

Jang and Tang (2009) examined international diversification and financial leverage to understand how they affect performance. The study verified that international diversification has a significant (albeit only indirect) influence on performance. This occurs through the moderating role of leverage. In this setting, there are indications that leverage exerts a considerable role in the relationship between diversification and performance and a direct relationship with performance.

Thus, this study uses companies' leverage as a moderating factor to determine its impact on the relationship between diversification and financial performance. The study presents the following research question: what is the influence of diversification and leverage on the financial performance of Brazilian and Mexican family businesses? In this context, the study identifies evidence of the influence of diversification and leverage on the financial performance of Brazilian and Mexican family businesses.

This study seeks evidence of diversification as a strategy that aids in improving companies' performance and whether the leverage has an impact on that relationship. Results can provide managers with information about the possibility of enhancing their diversification strategy. For other stakeholders, the study presents a panorama of companies' diversification strategies. It details whether those strategies are indeed suitable or whether an investment in specialized companies—that is, those without diversification—is a better alternative. In addition, the study provides an understanding of diversification in light of the performance of family companies and identifies the characteristics of this relationship

in the family context. Understanding how diversification is present in family businesses is important, considering that family companies tend to be conservative.

It is important to note that previous studies on diversification were carried out mainly on American companies. Studies focusing on European countries and on emerging economies were carried out at a later date. The empirical evidence points to unclear opinions and findings regarding diversification and company performance in emerging economies (Gyan, Brahmana, and Bakri 2017). Lee, Hooy, and Hooy (2012) emphasize that additional research is needed in emerging economies to verify common characteristics incorporated into emerging markets compared to established markets.

In-depth studies on diversification and performance are necessary in emerging countries, especially Latin America, which is considered an economic laboratory (Franko 2019) and is still little investigated regarding this particular relationship. The significance of Brazil and Mexico in this region is justified by their position as G-20 members and because they represent the largest economies in Latin America (International Monetary Fund (IMF) 2021). In addition, Brazil and Mexico participate in a leading economic activity of Latin American economies: the export of natural and mineral resources (Olave *et al.* 2020).

## Literature review and research hypotheses

### *Diversification and performance in family businesses*

Diversification occurs when companies operate in more than one industry (Santalo and Becerra 2008). This study focuses on forms of industrial and international diversification. In international diversification, the company extends its business beyond the geographical market in which it operates (Denis, Denis, and Yost 2002; Gyan, Brahmana, and Bakri 2017). In industrial diversification, the organization expands activities into more than one 'type of segment or product market (Gyan, Brahmana, and Bakri 2017; Sirmon, Hitt, and Ireland 2007).

According to Gyan (2017), diversification is a growth option for companies from emerging countries. In addition to the advantages of increased revenue and opportunities to reduce risks, it has the potential to create value for shareholders through the exploitation of economies of scope and the creation of internal capital and efficient labor markets (Purkayastha, Manolova, and Edelman 2012). According to Hirshleifer, Hsu, and Li (2013), in addition to reducing the organization's risk, diversification can be a useful mechanism for the company to expand its main business to other products and markets. In this context, diversification is usually related to financial performance, more specifically return on assets (ROA) and return on equity (ROE) (Singh, Nejadmalayeri, and Mathur 2007; Gyan, Brahmana, and Bakri 2017).

Maquieira, Espinosa, and Vieito (2011) emphasize that studies carried out in Chile on the relationship between performance and ownership structure present diversification as having a positive and statistically significant relationship with performance. Also, their results found that the more diversified companies are, the better their performance.

Regarding family businesses, Gomez-Mejia, Makri, and Kintana (2010) emphasize that diversification provides an opportunity to reduce corporate risks and therefore becomes an attractive strategic option with two significant benefits: it reduces the volatility of gains, providing greater financial security for the family, and it can improve the company's chances of survival.

Muñoz-Bullón and Sanchez-Bueno (2012) verified the moderating effect of family involvement in property and control over the relationship between diversification strategies (both of products and internationally) and corporate performance in European Union companies. The results pointed out that family businesses are more lucrative than nonfamily businesses when engaging in joint products and international diversification.

In analyzing Malaysian companies, Gyan, Brahmana, and Bakri (2017) investigated inconsistencies in the diversification-performance relationship, introducing efficiency as a moderating factor. They found that industrial diversification contributes significantly to improving performance, whereas international diversification has no effect on performance.

In Latin America, a large number of private companies are managed and controlled by families, and the degree of product diversification is higher (Rogers, Mendes-da-Silva, and Paula 2008). Purkayastha, Manolova, and Edelman (2012) affirmed that the competitive scenario in emerging economies remains dominated by large conglomerates, such as the India Group or the Carso Group in Mexico. Across the region, these diversified conglomerates are often controlled by families, and they represent 80 percent to 85 percent of the total sales and assets of the private sector.

In addition, economic environment determines the diversification of companies (Chakrabarti, Singh, and Mahmood 2007). Chakrabarti, Singh, and Mahmood (2007) investigated 3,117 firms operating in Indonesia, Japan, Malaysia, Singapore, South Korea, and Thailand to find that diversification provides greater benefits for firms operating in less institutionally developed environments because, in this context, intermediate institutions are less efficient, and diversification can provide gain scope and scale, typically provided by these institutions. Then, in these environments, increase the probability of firms diversify.

Considering that indications of family businesses having a positive association between diversification and performance, particularly in the economic environment of emerging countries, we present the first and second hypotheses of this study.

**H<sub>1</sub>:** Industrial or international diversification positively influences the performance of Brazilian family businesses.

**H<sub>2</sub>:** Industrial or international diversification positively influences the performance of Mexican family businesses.

### ***Leverage and performance in family businesses***

Financial leverage is the degree of debt in the capital structure and a frequently investigated element in analyses of the financial performance of companies, revealing positive or negative relationships between financial leverage and performance (Dalci 2018). Margaritis and Psillaki (2010) analyzed manufacturing companies in France and found that leverage has a positive effect on company performance. Some studies have also documented the positive relationship between leverage and performance in emerging economies (Abor 2005; Kyereboah-Coleman 2007).

Abor (2005) investigated the relationship between capital structure and profitability of companies listed on the Ghana Stock Exchange, finding a significant, positive relationship between short-term leverage and return on equity. However, the study also shows a negative relationship between long-term leverage and return on equity. This suggests that lucrative companies are more dependent on debt as a funding option. In the case of Ghana, a high proportion (85 percent) of debt is short term. Kyereboah-Coleman (2007) analyzed the relationship between capital structure and the performance of microfinance institutions in sub-Saharan Africa, showing that high leverage is positively related to both ROA and ROE.

González (2013) studied the effect of financial leverage on business operational performance and how its effect varies between countries. The results indicate that the effect of leverage on firm performance changes with the legal origin and the financial structure and development of countries. Fosu (2013) investigated the relationship between capital

structure and the performance of South African companies from 1998 to 2009. The results suggest that financial leverage has a positive and significant effect on the company's performance.

Mulyani, Singh, and Mishra (2016) examined the roles of dividends and leverage in Indonesian family businesses mitigating problems of agency. The authors found that family members tend to uphold smaller dividend payments and greater leverage than nonfamily members.

Considering evidence that family businesses from emerging countries present higher leverage and that leverage positively affects performance, the third and fourth hypotheses of this research are as follows:

**H<sub>3</sub>:** Leverage positively influences the performance of Brazilian family businesses.

**H<sub>4</sub>:** Leverage positively influences the performance of Mexican family businesses.

### ***Diversification, leverage, and performance in family businesses***

Leverage is also a factor to be considered for additional analyses of the effect of diversification on a company's performance, as it can affect its financial performance (Nuryatno 2015). Ferris, Sen, and Thu (2010) investigated companies in thirty-five emerging and developed countries, finding that leverage encourages companies to diversify industrially, mainly as a strategy to reduce debt costs by increasing tax protection.

Jang and Tang (2009) analyzed international diversification and financial leverage to explain how they influence profitability. A study of hotel companies presented an inverted U-shaped relationship between financial leverage and profitability, suggesting an ideal leverage pattern for maximum profitability. The study also found that international diversification exerts an indirect influence on the profitability. This influence occurs through the interaction between international diversification and leverage. The results indicate that financial leverage is more related to profitability than international diversification.

Foong and Idris (2012) examined the effect of leverage on the financial performance of Malaysian insurance companies and investigated whether the leverage-performance relationship is a function of or depends on the extent of product diversification. The authors observed a significant interaction effect between leverage and product diversity in a company's performance. The finding indicates that leverage may be beneficial or harmful to the financial performance of insurance companies depending on the extent of the company's product diversity. Nuryatno (2015) analyzed the influence of leverage and diversification on the financial performance of insurance companies in Indonesia. The results showed that leverage and diversification positively affect the financial performance of insurance companies in Indonesia.

There is evidence that leverage has a role in the relationship between diversification and performance. This study considers it a moderating variable in the diversification-performance relationship (for a model of the full study, see Figure 1). Thus, we present the fifth and sixth hypotheses of this research:

**H<sub>5</sub>:** Leverage positively influences the relationship between industrial or international diversification and performance of Brazilian family businesses.

**H<sub>6</sub>:** Leverage positively influences the relationship between industrial or international diversification and performance of Mexican family businesses.

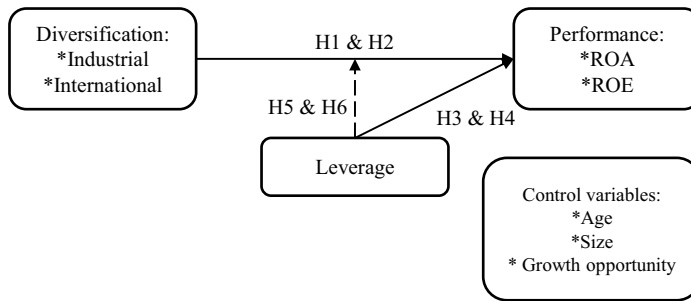


Figure 1. Conceptual framework.

## Research methodology

This study is characterized as descriptive, quantitative, and archival research. The population of the study comprises Brazilian and Mexican publicly traded family companies. On the Brazilian B3 stock exchange, there are 424 listed companies, of which 173 are family businesses. On the Mexican stock exchange, there are 110 listed companies, of which 76 are family businesses. After excluding state-owned enterprises, financial companies, nonfamily companies, and those with insufficient data for the analyzed period, the final study sample comprised 102 Brazilian family businesses and 71 Mexican family businesses.

We defined family businesses as those in which family members held 20 percent or more of the company's common shares (Singla, Veliyath, and George 2014; Purkayastha, Veliyath, and George 2019) and/or at least two family members sat on the board of directors (Anderson and Reeb 2003; Laffranchini and Braun 2014). In Brazil, the information for this classification of family businesses was taken from the B3 stock exchange reference forms. For the classification of companies as family businesses, the study analyzed the control and economic group information in item 15 of the reference form, more precisely, the shareholding position in item 15.1/2. In addition, the study analyzed the surname of members of the board of directors in item 12.5/6 and family relationships in item 12.9 of the reference form. In Mexico, family participation was defined by consulting the "Información de Emisora" (issuer information) page and the item "Consejo de Administración" (board of directors) on the website of the Mexican stock exchange. For the classification of companies as family businesses, the study analyzed the surname and position of members of the board of directors.

Data on to dependent, independent, and control variables were collected in the Thomson Reuters Eikon database for the ten-year period 2009–2018. Table 1 presents the variables used in the study, as well as the measurement and base authors.

We used descriptive statistics, t-tests, and ordinary least squares (OLS) regression for data analysis in Stata (Hair et al. 2005). We observed a few assumptions for the OLS regression, such as normality and absence of multicollinearity, heteroskedasticity, and autocorrelation (Fávero et al. 2009). Thus, we used the Shapiro-Francia test, the variance inflation factor, and the White and Durbin-Watson tests, which presented results within the reference standards. Sector and active year effects were considered for all models.

**Table 1.** Variables specifications.

Variable	Measurement	Authors
<b>Dependent variable</b>		
Performance (PER)	$ROA = \frac{\text{Net Income}}{\text{Total Assets}}$	Gyan, Brahmana, and Bakri (2017); Chou and Shih (2020)
	$ROE = \frac{\text{Net Income}}{\text{Equity}}$	Xiao and Xu (2019); Zúñiga-Vicente et al. (2019)
<b>Independent variables</b>		
Industrial diversification (DIND)	<i>Dummy</i> : 1 if the company operates in two or more different segments of 4-digit NAICS code; 0 otherwise.	Ahn, Denis, and Denis (2006); Gyan, Brahmana, and Bakri (2017); Xiao and Xu (2019)
International diversification (DINT)	<i>Dummy</i> : 1 if the company presents more than 10% of sales in a foreign market; 0 otherwise.	Fauver, Houston, and Naranjo (2004); Lee, Hooy, and Hooy (2012); Gyan, Brahmana, and Bakri (2017)
Leverage (LEV)	$LEV = \frac{\text{Total Debt}}{\text{Total Equity}}$	Ahn, Denis, and Denis (2006); Chou and Shih (2020)
<b>Control variables</b>		
Years of Activity (AGE)	Company's years of activity since its constitution	Fauver, Houston, and Naranjo (2004); Lee, Hooy, and Hooy (2012); Gyan, Brahmana, and Bakri (2017)
Size (SIZE)	Natural logarithm of total assets	
Growth opportunity (GO)	$GO = \frac{\text{Capital Expenditure}}{\text{Operating Income}}$	

The following models were used for the OLS regression of Brazilian family companies' data, with Equations 1–4:

$$ROA_{BRA} = \beta_0 + \beta_1 DIND + \beta_2 DINT + \beta_3 LEV + \beta_4 AGE + \beta_5 SIZE + \beta_6 GO + \sum \text{IndustryFixedEffects} + \sum \text{YearFixedEffects} + \varepsilon \quad (1)$$

$$ROE_{BRA} = \beta_0 + \beta_1 DIND + \beta_2 DINT + \beta_3 LEV + \beta_4 AGE + \beta_5 SIZE + \beta_6 GO + \sum \text{IndustryFixedEffects} + \sum \text{YearFixedEffects} + \varepsilon \quad (2)$$

$$ROA_{BRA} = \beta_0 + \beta_1 DIND + \beta_2 DINT + \beta_3 LEV + \beta_4 DIND * LEV + \beta_5 DINT * LEV + \beta_6 AGE + \beta_7 SIZE + \beta_8 GO + \sum \text{IndustryFixedEffects} + \sum \text{YearFixedEffects} + \varepsilon \quad (3)$$

$$ROE_{BRA} = \beta_0 + \beta_1 DIND + \beta_2 DINT + \beta_3 LEV + \beta_4 DIND * LEV + \beta_5 DINT * LEV + \beta_6 AGE + \beta_7 SIZE + \beta_8 GO + \sum \text{IndustryFixedEffects} + \sum \text{YearFixedEffects} + \varepsilon \quad (4)$$

The following models were used for the OLS regression of Mexican family companies' data, with Equations 5–8:

$$\begin{aligned} \text{ROA}_{\text{MEX}} = & \beta_0 + \beta_1 \text{DIND} + \beta_2 \text{DINT} + \beta_3 \text{LEV} + \beta_4 \text{AGE} + \beta_5 \text{SIZE} + \beta_6 \text{GO} \\ & + \sum \text{IndustryFixedEffects} + \sum \text{YearFixedEffects} + \varepsilon \end{aligned} \quad (5)$$

$$\begin{aligned} \text{ROE}_{\text{MEX}} = & \beta_0 + \beta_1 \text{DIND} + \beta_2 \text{DINT} + \beta_3 \text{LEV} + \beta_4 \text{AGE} + \beta_5 \text{SIZE} + \beta_6 \text{GO} \\ & + \sum \text{IndustryFixedEffects} + \sum \text{YearFixedEffects} + \varepsilon \end{aligned} \quad (6)$$

$$\begin{aligned} \text{ROA}_{\text{MEX}} = & \beta_0 + \beta_1 \text{DIND} + \beta_2 \text{DINT} + \beta_3 \text{LEV} + \beta_4 \text{DIND} * \text{LEV} + \beta_5 \text{DINT} * \text{LEV} \\ & + \beta_6 \text{AGE} + \beta_7 \text{SIZE} + \beta_8 \text{GO} + \sum \text{IndustryFixedEffects} \\ & + \sum \text{YearFixedEffects} + \varepsilon \end{aligned} \quad (7)$$

$$\begin{aligned} \text{ROE}_{\text{MEX}} = & \beta_0 + \beta_1 \text{DIND} + \beta_2 \text{DINT} + \beta_3 \text{LEV} + \beta_4 \text{DIND} * \text{LEV} + \beta_5 \text{DINT} * \text{LEV} \\ & + \beta_6 \text{AGE} + \beta_7 \text{SIZE} + \beta_8 \text{GO} + \sum \text{IndustryFixedEffects} \\ & + \sum \text{YearFixedEffects} + \varepsilon \end{aligned} \quad (8)$$

Equations 3–4 and 7–8 differ from Equations 1–2 and 5–6 by the inclusion of interactions between diversification (DIND e DINT) and leverage (LEV).

## Results

Table 2 presents the descriptive analysis of the variables for each country, as well as the mean, standard deviation, and minimal and maximum values. It is verified in Table 2 that the ROA of Brazilian family companies is, on average, less than that of Mexican family companies—0.058 and 0.073, respectively. Regarding ROE, Brazilian companies present a better indicator when compared to Mexicans—0.085 and 0.069, respectively. These results indicate that Brazilian companies have greater profitability regarding their equity, while Mexicans exhibit higher profitability regarding their total asset.

Regarding leverage, Brazilian companies have 31 percent of their assets committed to costly debts; in Mexican companies, this value is 28 percent. Regarding years of activity, Brazilian family businesses are older, with an average of fifty-seven years of activity. Mexican companies average thirty-eight years of active business. Mexican companies, however, possess a higher value by total assets than Brazilian ones. Mexican family businesses present, on average, US\$21 billion in assets, whereas Brazilians present US\$2 billion. Regarding growth opportunity, Mexican companies possess a higher indicator than Brazilians—0.693 and 0.514, respectively.

Table 3 shows that, on average, 33 percent of Brazilian companies are diversified industrially and 26 percent are diversified internationally. Mexican companies are more likely to be diversified—47 percent are diversified industrially and 53 percent are diversified internationally. Thus, Brazilian companies are more diversified industrially than internationally and Mexican companies are more diversified internationally than industrially.

Also, most Brazilian family businesses with industrial and international diversification operate in industrial goods (40 percent and 23 percent), consumer cyclicals (30 percent and 34 percent), and basic materials (11 percent and 23 percent). For Mexican family businesses, companies with industrial and international diversification are concentrated



**Table 2.** Descriptive analysis of the variables.

Variable	Brazil				Mexico			
	Mean	SD	Min	Max	Mean	SD	Min	Max
ROA	0.058	0.123	-1.688	0.612	0.073	0.116	-1.868	0.737
ROE	0.085	0.423	-2.473	2.944	0.069	0.485	-6.259	6.442
LEV	0.310	0.223	0	1.849	0.273	0.215	0	3.228
AGE	57.547	30.734	6	130	38.888	22.552	4	100
SIZE (mi)	5,729	12,250	4	122,502	55,805	154,137	157	1,515,042
GO	0.514	1.188	-8.471	8.011	0.693	22.842	-2.968	4.821

Notes: SD = standard deviation; ROA = return on assets; ROE = return on equity; LEV = leverage; AGE = years of activity; SIZE = size; GO = growth opportunity.

**Table 3.** Industrial and international diversification by sector and country.

Sector	Brazil				Mexico			
	DIND		DINT		DIND		DINT	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Industrial goods	117	40.07	53	22.84	68	21.32	54	15
Cyclical consumption	89	30.48	79	34.05	86	26.96	61	16.94
Noncyclical consumption	37	12.67	47	20.26	70	21.94	77	21.39
Energy	0	0	0	0	0	0	0	0
Basic materials	33	11.30	53	22.84	76	23.82	142	39.44
Health	6	2.05	0	0	2	0.63	15	4.17
Information technology	10	3.42	0	0	0	0	0	0
Telecommunications	0	0	0	0	7	2.19	11	3.06
Public utility	0	0	0	0	10	3.13	0	0
Total	292	32.88*	232	26.13*	319	46.77*	360	52.79*

Notes: The total percentages were calculated on the basis of the total number of observations for each country (888 observations for Brazil; 682 for Mexico). For both countries, DIND (industrial diversification) and DINT (international diversification) are dummy variables.

in basic materials (24 percent and 39 percent), consumer cyclicals (27 percent and 17 percent), and noncyclical consumption (22 percent and 21 percent). Both Brazilian and Mexican family businesses, the diversification enterprises occurs in specific sectors, mainly related to industrials and consumer sectors.

Table 4 shows the *t*-test results of the main variables analyzed, comparing Brazilian and Mexican family businesses. Brazilian and Mexican family businesses display significant differences regarding ROA, industrial and international diversification, and leverage. However, ROE was not notably different between the countries. Mexican companies exhibit higher return on assets than Brazilian ones. Comparing to Brazil, Mexico possesses a greater concentration of industrially and internationally diversified companies. Alternatively, Brazilian companies have greater leverage than Mexican ones.

Table 5 shows results of the OLS regression for Equations 1 and 5, for the relationship between ROA, industrial and international diversification, and leverage. Regarding  $R^2$ , the Brazilian model has an explanatory power of 15 percent; for Mexico, this value is

**Table 4.** Results for t-tests.

	Brazil		Mexico		t-Test
	Mean	Std. Err.	Mean	Std. Err.	
ROA	0.058	0.004	0.073	0.004	2.534**
ROE	0.085	0.014	0.069	0.018	-0.685
DIND <sup>a</sup>	0.328	0.015	0.467	0.019	5.604***
DINT <sup>a</sup>	0.261	0.014	0.527	0.019	11.036***
LEV	0.310	0.007	0.273	0.008	-3.348***
Observations	888		682		

Notes: ROA = return on assets; ROE = return on equity; DIND = industrial diversification; DINT = international diversification; LEV = leverage.<sup>a</sup>Dummy variable.

\*\* $p < .05$ . \*\*\* $p < .01$ .

**Table 5.** OLS regression: Diversification, leverage, and performance.

	Brazil		Mexico		Brazil		Mexico	
	ROA Equation 1		ROA Equation 5		ROE Equation 2		ROE Equation 6	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Independent variables								
Intercept	-0.315	0.062	0.161	2.651	0.088	0.239	8.565	13.168
DIND <sup>a</sup>	<b>0.020**</b>	0.009	0.011	0.007	-0.026	0.032	-0.022	0.039
DINT <sup>a</sup>	<b>-0.018*</b>	0.010	<b>0.018**</b>	0.007	<b>-0.078**</b>	0.036	<b>0.080**</b>	0.038
LEV	<b>-0.133***</b>	0.018	<b>-0.305***</b>	0.017	-0.078	0.081	-0.119	0.087
Control variables								
AGE	-0.000*	0.000	-0.000***	0.000	-0.000	0.000	-0.000	0.000
SIZE	<b>0.019***</b>	0.002	<b>0.008***</b>	0.002	0.007	0.010	<b>0.042***</b>	0.013
GO	<b>0.007**</b>	0.003	0.000	0.000	-0.010	0.017	-0.000	0.000
Model information								
Prob > F	0.000		0.000		0.000		0.003	
R <sup>2</sup>	0.147		0.317		0.034		0.033	
Adjusted R <sup>2</sup>	0.125		0.309		0.010		0.022	
Durbin-Watson	1.849		1.966		1.960		2.375	
VIF	1.580		1.300		1.580		1.300	
Observations	888		682		888		682	

Notes: ROA = return on assets; ROE = return on equity; DIND = industrial diversification; DINT = international diversification; LEV = leverage; AGE = years of activity; SIZE = size; GO = growth opportunity.<sup>a</sup>Dummy variable.

\*\* $p < .1$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

32 percent. Table 5 also presents results of the OLS regression for Equations 2 and 6, for the relationship between ROA, industrial and international diversification, and leverage. Regarding R<sup>2</sup>, the Brazilian model has an explanatory power of 3 percent; for Mexico, this value is also 3 percent.

Table 5 presents the DIND variable as positively related to ROA for Brazil (Equation 1). When Brazilian family businesses diversify operations, the greater is their ROA. These results are similar to those found by Gyan, Brahmana, and Bakri (2017), who found that industrial diversification significantly improves performance, specifically return on assets. Regarding the DINT variable, we found a negative and significant relationship with both ROA (Equation 1) and ROE (Equation 2). This suggests that companies that diversify into other countries reduce their ROA and ROE.

For Mexico (Equation 5), the DINT variable was positively related to ROA, indicating that when Mexican family businesses diversify into other countries, ROA is higher. These results are similar to the study of Muñoz-Bullón and Sanchez-Bueno (2012), which found that family businesses are more lucrative when diversified internationally. In this regard, Chakrabarti, Singh, and Mahmood (2007) note that a possible justification for companies' diversification is economic environment. In less institutionally developed environments diversification contribute with a gain scope and scale, typically provided by market, that is less efficient, in this context. Also regarding the DINT variable, a positive and significant relationship was found with the ROE profitability indicator (Equation 6): when Mexican family businesses diversify into other countries, they increase their ROE performance.

Leverage has a negative and significant relationship to ROA for both Brazilian and Mexican businesses. It indicates that higher commitment to costly debts lowers the ROA performance. This result resembles findings of González (2013) and Gyan, Brahmana, and Bakri (2017), who found that the performance of companies with greater leverage is reduced significantly.

As for the control variables, for Brazilian businesses, company size (SIZE) and growth opportunity (GO) are positively related to ROA. The results indicate that the more total assets and the higher the growth opportunity indicator, the higher is the ROA performance for Brazilian family businesses. For Mexican businesses, the company size (SIZE) had a positive relationship with ROA and ROE, which indicates that the higher these values are in relation to total assets, the greater the performance regarding assets and equity. Findings for company size (SIZE) are similar to those of Gyan, Brahmana, and Bakri (2017) and Zúñiga-Vicente and colleagues (2019), who found a positive relationship with ROA. Growth opportunity was not significant in the studies of Gyan (2017) and Gyan, Brahmana, and Bakri (2017).

When analyzing the results, we noted that industrial diversification increases the return on assets for Brazilian family businesses. For Mexican family businesses, international diversification increases the return on assets and return on equity. Thus, Hypotheses 1 and 2 are supported. Regarding leverage, we found a negative relationship with ROA and no significant relationship with ROE for both Brazilian and Mexican family businesses. Hypotheses 3 and 4 are not supported. Thus, diversification is a strategy that increases company performance in emerging economies such as Brazil and Mexico, which indicates that the benefits derived from it exceed the respective costs. In this context, diversification can improve companies' performance by allowing increased revenue and opportunities and reducing risk due to earnings streams across different businesses (Benito-Osorio, Guerras-Martín, and Zúñiga-Vicente 2012; Purkayastha, Manolova, and Edelman 2012).

Table 6 shows the result of the OLS regression relative to Equations 3 and 7, referring to the relationship between ROA and industrial and international diversification, mediated by leverage. Regarding  $R^2$ , the Brazilian model has an explanatory power of 13 percent; for Mexico, this value is 49 percent. Table 6 shows the result of the OLS regression relative to Equations 4 and 8, which refer to the relationship between ROE and industrial and international diversification, mediated by leverage. Regarding  $R^2$ , the Brazilian model has an explanatory power of 4 percent; for Mexico, this value is also 4 percent.

**Table 6.** OLS regression: Leverage moderation.

	Brazil		Mexico		Brazil		Mexico	
	ROA Equation 3		ROA Equation 7		ROE Equation 4		ROE Equation 8	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Independent variables								
Intercept	6.416	2.789	-0.397	2.302	0.021	0.243	9.255	13.143
DIND <sup>a</sup>	0.006	0.016	-0.091***	0.011	0.001	0.047	0.045	0.063
DINT <sup>a</sup>	-0.018	0.021	-0.059***	0.011	0.112	0.087	-0.013	0.064
LEV	-0.154***	0.021	-0.522***	0.021	0.018	0.085	-0.136	0.121
<b>DIND*LEV</b>	<b>0.070*</b>	0.042	<b>0.387***</b>	0.031	-0.116	0.183	-0.234	0.179
<b>DINT*LEV</b>	0.011	0.051	<b>0.295***</b>	0.033	<b>-0.523*</b>	0.290	<b>0.344*</b>	0.193
Control variables								
AGE	-0.000	0.000	-0.000***	0.000	-0.001*	0.000	-0.000	0.000
SIZE	0.018***	0.002	0.005**	0.002	0.009	0.011	0.039***	0.013
GO	0.006**	0.003	0.000	0.000	-0.011	0.016	-0.000	0.000
Model information								
Prob > F	0.000		0.000		0.000		0.001	
R <sup>2</sup>	0.130		0.487		0.044		0.040	
Adjusted R <sup>2</sup>	0.120		0.479		0.017		0.026	
Durbin-Watson	1.887		1.996		1.950		2.357	
VIF	3.750		3.690		4.680		3.690	
Observations	888		682		888		682	

Notes: ROA: return on assets; ROE = return on equity; DIND = industrial diversification; DINT = international diversification; DIND\*LEV = interaction between DIND and LEV; DINT\*LEV = interaction between DINT and LEV; LEV = leverage; AGE = years of activity; SIZE = size; GO = growth opportunity.<sup>a</sup>Dummy variable.

\*\*\* $p < .01$ . \*\* $p < .05$ . \* $p < .1$ .

Table 6 shows results for Brazil (Equation 3) and Mexico (Equation 7) on the DIND\*LEV variable, which has a positive and significant relationship with ROA. This indicates that leverage moderates the relationship between industrial diversification and return on assets. The greater the leverage of Brazilian and Mexican family businesses, the more positive is the relationship between industrial diversification and ROA. In other words, Brazilian and Mexican family businesses that are more dependent on third-party capital and operate in more than one market segment potentially increase the profitability of their assets.

For Mexican companies, the DINT\*LEV variable has a positive relationship with ROA (Equation 7) and ROE (Equation 8). This result indicates that leverage moderates the relationship between international diversification and return on both assets and equity. The greater the leverage of Brazilian and Mexican family businesses, the greater is the positive relationship between international diversification and ROA and ROE. Thus, companies that are more dependent on third-party capital and operate in international markets uses its assets and equity more efficiently to generate a profit.

These results are similar to those of Foong and Idris (2012), who observed a significant interaction effect between leverage and product diversification on company performance—more precisely, ROE. They are also in line with those of Nuryatno

(2015), who demonstrated that leverage and diversification positively affect the financial performance of companies.

For Brazilian companies, the DINT\*LEV variable (Equation 4) has a negative relationship with ROE, which intensifies when leverage increases. Thus, companies that are more dependent on third-party capital and operate in international markets potentially reduce their profitability because the return on equity is lower.

International diversification was not favorable to ROE for Brazilian family businesses, including when analyzing the moderating effect of leverage. The negative relationship between diversification and performance was also verified by Singh, Nejadmalayeri, and Mathur (2007), who described the increase of agency problems and operational inefficiency as possible factors reducing the performance of diversified companies. In this sense, Brazilian family businesses working with international diversification may have reduced ROE due to increased agency problems (e.g., conflicts between management and stockholders) or having to manage costs of expanding into new markets.

Hypothesis 5 is supported: leverage moderates the relationship between industrial diversification and return on assets for Brazilian family businesses. Hypothesis 6 is also supported: leverage moderates the relationship between industrial diversification and ROA, as well as international diversification and ROA and ROE, for Mexican family companies.

Thus, the results of this study demonstrate that family businesses in emerging economies, such as Brazil and Mexico, that are more dependent on third-party capital and operate in more than one market segment or in international markets potentially increase their performance. Performance has a positive impact on return on assets for Brazilian and Mexican companies. For Mexican businesses, it also has an impact on return on equity. This study highlights those resources obtained from debt are likely used to increase diversified activities and uphold previous ones. It improves the results of a diversification strategy.

## Conclusion

This study identified evidence of the influence of diversification and leverage on the financial performance of Brazilian and Mexican family businesses. The results indicate greater diversification in relation to the market segment for Brazilian family companies. For Mexican companies, international diversification stands out. It was also verified that Brazilian family businesses have greater leverage, whereas Mexican family companies have higher ROA and are more diversified industrially and internationally.

Also, evidence points to differences in the diversification and performance relationship between countries. When Brazilian family businesses diversify market segments, they increase ROA. In international markets, these companies have lower ROA and ROE. For Mexican companies, international diversification equates to a higher ROA and ROE.

Regarding leverage, higher debt is associated with lower return on assets for both Brazilian and Mexican companies. Furthermore, we found no significant relationship with return on equity. We did find that leverage positively moderates the relationship between industrial diversification and return on assets for Brazilian and Mexican family businesses. It also positively moderates the relationship between international diversification and return on assets and equity for Mexican family companies.

By studying the relationship between diversification and performance, this study presents evidence that diversification affects performance in terms of both ROE and ROA. The benefits derived from the implementation of diversification strategies, such as industrial and international, outweigh the respective costs. Diversification can improve company performance by enabling increased gains and opportunities.

In investigating how leverage moderates the relationship between diversification and performance, the study presents evidence that diversified companies can achieve better performance indicators when they are leveraged. This means that companies that are more dependent on third-party capital and act in more than one market segment or international markets potentially increase the profitability of their assets and equity. Thus, this study highlights the fact that resources obtained from debt are likely used to increase diversified activities and uphold previous ones. It improves the results of the diversification strategy. Leverage is an essential element for financing a diversification strategy and ensuring its benefits.

Despite indications in the literature that family companies are often more conservative when it comes to diversification, this study shows that many family businesses in Brazil and Mexico employ some diversification strategy. Although families seek to maintain control of the business, they are also adhering to strategies to diversify their wealth and improve the companies' prospects.

The study points to the importance of family companies in emerging markets, more precisely in turbulent markets such as Brazil, to seek diversification strategies to some degree. When diversifying, companies seek strategic benefits to address market difficulties and imperfections. The results may contribute to the development of public policies to reinforce the growth and consolidation of family businesses. Finally, the study also expands studies focused on diversification, leverage, and performance in emerging economies, more specifically Latin America. Many studies on these topics are still concentrated in the scenarios of developed countries.

The study presents a few methodological limitations. First, the results cannot be applied to all publicly traded companies, only those that are family businesses as defined in this research and nonfinancial companies. Furthermore, both Brazil and Mexico have a considerable number of privately held family businesses that are not included in the research. Second, there is no standard scope in the literature to define a family business. Therefore, the population used in the study may not reflect the reality of this business group in its entirety, as the parameters used may not be able to identify all family companies. Third, the dichotomous variables used to measure diversification (industrial and international) do not allow for identification of whether diversification occurs in similar or distinct segments or for carrying out an analysis in terms of diversification levels.

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