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EFFECT OF CORRUPTION CONTROL ON FINANCIAL PERFORMANCE AND MARKET VALUE: A MULTILEVEL ANALYSIS OF LATIN AMERICAN COMPANIES

EDSON CARLOS CORDEIRO JÚNIOR[1]
Universidade Federal de Uberlândia
https://orcid.org/0000-0001-9908-909X
edsoncarloscjr@gmail.com

LUCIANA CARVALHO
Universidade Federal de Uberlândia
https://orcid.org/0000-0001-9645-8718
lucarvalho@ufu.br

LÍVIA BONONI PAIVA TOMAZ
Universidade Federal do Triângulo Mineiro
https://orcid.org/0000-0002-8798-078X
liviabpt@gmail.com

ABSTRACT

Organizations have increasingly focused on performance and market value, as demonstrated by recent national and international studies. Another notable point is the impact of corruption on the organizational environment. This concern primarily arises from recent discoveries of crimes involving major companies and the highest levels of government. This work aims to establish a relationship between these two themes. For this reason, this study intends to explain how financial performance and market value of companies behave depending on the country-level control of corruption. The country-level corruption control used will be the World Bank metric, which establishes a kind of corruption ranking for countries. The sample will consist of Latin American countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Jamaica, Mexico, and Peru, covering the period from 2012 to 2022. To achieve the objective of this research, the Multilevel Linear Model was used, which allows for the alignment of variables at different levels, in this case, country level and company level. The results suggest a significant positive relationship between performance, market value, and country-level corruption control, indicating that corruption can act as a sort of sand in the gears of organizations. This suggests that as countries manage to control and primarily reduce their levels of corruption, the financial performance and market value of companies located in Latin American countries improve. As a suggestion for future research, it is proposed that the same analytical method be applied in other regions, comparing performance and market value to better understand global corruption aspects.

Keywords: Performance. Market Value. Corruption Control. Latin America. Multilevel Regression.

Edited in Portuguese and English. Original version in Portuguese.

[1] **Correspondence address:** Av. João Naves de Ávila, 2121 - 1F | Santa Mônica | 38408-100 | Uberlândia/MG | Brazil.

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1 INTRODUCTION

The frequency of scandals involving business conduct has grown considerably, especially in developing economies. According to the non-governmental organization Transparency International (2023), 72% of companies in such economies reported having been victims of corruption in 2023. an increase of 15% compared to 2020. This issue is related to the fragile risk management and corporate governance systems established in companies and countries (Gavíria, 2002; Donadelli et al., 2014; Xiao et al., 2017; Song & Han, 2017).

Corporate crimes encompass a multitude of definitions and contexts, intrinsically related to their impacts on societies and economies. Understanding this issue requires analyzing the various concepts and approaches associated with organizational crime and its nuances in moral, political, and social scenarios (Shleifer & Vishny, 1993; Mauro, 1995). According to Weissmann and Block (2007), corporate crime is a broad set of illegal acts, including online fraud, tax evasion, insider trading, bribery, money laundering, and embezzlement, among others, while corruption is the abuse of public power by public or private agents in exchange for undue advantages, violating principles of probity and impartiality. Corruption is a multidimensional process, a phenomenon caused by a combination of economic, political, and social factors (Xiao et al., 2017).

For the purposes of this research, the concept of corruption used will be that of Weissmann and Block (2007), defined as the abuse of public power in exchange for undue advantages. Initially, it is important to note that the scientific debate on the impact of corruption on organizations has been ongoing for decades. Fisman and Svensson (2007) highlight that corruption leads to investment inefficiency, as part of the resources is diverted to corrupt institutions and public officials through bribes, which increases the cost of products and public services necessary for business activities. Corruption negatively impacts company performance and reduces productivity (McArthur, 2002); it affects the growth and profitability of countries and companies and is a significant detriment to stakeholders (Garmaise & Liú, 2005). In this sense, corruption functions as a kind of "sand" or "rust" that clogs and corrodes the gears of the economy (Murphy et al., 1993; Fisman, 2001; Zeume, 2016).

Although the negative impact of corruption seems unanimous, since the 1960s, some research has questioned the harmful nature of the crime and presented the hypothesis that corruption might have positive aspects. Authors such as Nathaniel Leff (1964), Leys (1965), and Anechiarico and Jacobs (1996) argue that corruption can be beneficial, functioning as a "lubricant" that facilitates the functioning of the economy. According to them, the benefits of corruption outweigh the costs (Méon & Weill, 2010; Warren, 2006).

This ambiguous nature arises from the difficulty in perceiving the impacts of corruption on different markets and organizations, especially when using economic performance as the point of analysis, as it can be both positive and negative (Bak, 2020). The relevance of this study lies in the importance of a more comprehensive analysis of the effects of corporate crime on organizational performance (Song & Han, 2017). Of all the issues that organizational administrations face, unethical corporate activity is one of the most significant in terms of its potential negative impact and also one of the most difficult to address adequately (Schwartz, 2013).

Corruption functions as a "tax"; it brings uncertainties and risks about future events, affecting companies' investment decisions (Fisman & Svensson, 2007; Pellicani, 2017), and consequently impacts the performance and market value of companies (Donadelli et al., 2014; Dong et al., 2022).

There is a relationship between corruption and financial performance, especially Return on Assets (ROA), an indicator that measures a company's operational efficiency in generating profits from its assets (Damodaran, 2009). The literature does not reach a consensus on whether this relationship is positive or negative, and results vary depending on the countries and scenarios under analysis. Corruption negatively affects non-financial companies in Nigeria (Ojeda et al., 2019).

On the other hand, in the United States, companies located in areas with corruption problems show better financial performance compared to those in states with better corruption control (Willcott, 2018). In India, public banks have better results in areas with lower corruption control (Sharma & Verma, 2017). This dichotomy between corruption and financial performance can be considered either profitable or detrimental depending on the country, region, and locality of the study.

This division regarding the effects of corruption on organizations also extends to market value. The relationship between the number of shares and their value can be affected by increased corruption and competition in the sector under analysis (Varvarigos & Stathopoulou, 2023). Mai's (2020) research indicates that corruption has a significant impact on market capitalization and liquidity in emerging countries, but is not significant in developed countries. Companies with better anti-corruption practices show significant fluctuations in market value, while companies with weaker practices do not experience such impacts (Cardoni et al., 2024).

Given this scenario, the question arises: what is the relationship between country-level corruption control and the financial performance and market value of companies in Latin America? In the business context, corruption generates costs and risks, impacting the performance and value of companies (Ashfort et al., 2008). This study analyzes Latin American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Jamaica, Mexico, and Peru), as they not only have developing economies but also exhibit low corruption perception indices, according to the NGO Transparency International (2023). The literature treats corruption as a systemic problem that negatively affects the economic and social development of Latin America (Mauro, 1995; Kaufmann et al., 2010; Lambsdorff et al., 2004). Additionally, these countries were chosen for their better representativeness and availability of secondary data in the Refinitiv Eikon database. Therefore, the aim of the article is to investigate whether companies in the capital markets of these countries experience impaired financial performance and market value due to low corruption control, using the corruption control metric provided by the World Bank.

The research aims to investigate the relationship between corruption control and the financial performance of companies in Latin America, using indicators such as ROA and market value. It intends to assess how these indicators behave in regions known for having low corruption control. By deepening the understanding of the impacts of corruption, the study hopes to contribute to the debate on improving the business environment in Latin America, promoting transparency and competitiveness in the region.

The analysis covers the period from 2012 to 2022. The start year was chosen because it was the year when all the selected countries for the sample adopted at least some of the International Financial Reporting Standards (IFRS) - guidelines standards for the internationalization of accounting (Camfferman & Zeff, 2007), ensuring the availability of adequate data for the research. The end year was chosen because 2022 is the most recent year for which the World Governance Indicators (WGI) provided by the World Bank were available during the conduct of this research.

2 THEORETICAL FRAMEWORK

Corruption diverts resources that could be used for useful investments to increase productivity. Spending on corruption affects decision-making in companies (Shleifer & Vishny, 1993; Mauro, 1995). It is a problem that jeopardizes companies by damaging their reputations, brands, and the morale of organizations and countries (Del Bosco & Misani, 2011). Corruption causes effects that impact investor confidence and restrict economic growth to the extent of causing serious problems such as a decline in foreign direct investment and an increase in income inequality (Zhang, 2012). It has a negative impact on stock returns and is one of the main obstacles to the development of the stock market (Ahmed, 2020).

Inefficiency in directing investments is one of the main problems, with resources diverted

to feed the corruption machine through bribes and other shady mechanisms (Fisman & Svensson, 2007). This practice artificially raises the costs of essential public products and services for business activities, burdening companies and negatively impacting their competitiveness. Corruption is directly related to lower growth and reduced profitability of companies (Garmaise & Liu, 2005).

The involvement of companies in corruption scandals affects their reputation, which translates into a loss of trust from consumers, investors, and partners. This poor image directly impacts the market value of companies, which may experience sharp declines and face difficulties in raising capital for new investments (Del Bosco & Misani, 2021). The perception of a high level of corruption in a country or sector can lead companies to reassess their investments, opting to direct them to safer locations with better return prospects. This negatively impacts the value of companies, making them less attractive to investors in a corrupt market (Djankov et al., 2020). The relationship between corruption and market value is complex and multifaceted, but studies show a negative association between the two elements, even after accounting for other relevant factors (Levine, 2019; Rose-Ackerman, 2022).

The theory presented by McArthur (2002) and Garmaise & Liú (2005) highlights that corruption can have strong effects on financial markets. This is consistent with recent studies that clarify that higher levels of corruption in a country are associated with higher financing costs, which would affect investment decisions and reduce performance, as part of profitability would be diverted to pay for corruption (Pellicani, 2017). It is a fact that in environments with corruption, markets tend to operate inefficiently. In these contexts, it is likely that only companies willing to "lubricate the gears of bureaucracy" will achieve better performance at the company level (Fisman, 2001; Lin Chen et al., 2016).

The literature presented so far demonstrates that corruption and financial performance may be related to regional factors, meaning that countries with distinct characteristics might experience the impacts of corruption differently. Local legal protections for investors can positively or negatively affect the corruption levels in these regions (Dong et al., 2022).

In a study of companies in developed countries, Donadelli et al. (2014) use regression analysis to relate agency problems, financial performance, and corruption in Australia, Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States. The results revealed that corruption has negative impacts on stock returns; they also showed consistent results regarding the sensitivity of corruption across different production sectors. In Europe, Charron et al. (2016) relate corruption and meritocracy in public careers; they conclude that the risks of corruption are indeed significantly lower when the career incentives for bureaucrats follow exclusively professional criteria.

Liew and Stevens (1996) explain that emerging markets with high levels of corruption exhibit a higher risk premium, resulting in higher average returns to compensate investors for the additional risk. Stock market reactions to news of corruption in a particular company are negative, regardless of the country's level of corruption (Botn & Dahl, 2015). High levels of corruption in the public sector negatively influence the stock prices of publicly traded companies (Porta et al., 1998).

Habib and Zurawicki (2002) are intrigued and seek to explain why China, Brazil, Thailand, and Mexico attract significant foreign direct investment (FDI) despite their high corruption perception. The authors' results confirm the studies by Shleifer and Vishny (1993), which suggest that FDI is reduced by corruption. Investor countries avoid corruption as they see it as a factor that can create operational inefficiencies. Gaviria (2002), in a study focused on Latin America, finds results linking the negative effects of corruption to sales, investment, and growth of companies. In Africa, McArthur (2002) finds robust results supporting the claim that corruption erodes more than half of companies' productivity.

In Nigeria, the perception of corruption and poor institutional quality are negatively

associated with company performance, as evidenced by lower market value (Tobin's Q) and accounting performance (ROA) (Ojeka et al., 2019). In East Asia and the Pacific, corruption has a complex relationship with stock market development, positively affecting market capitalization and liquidity in underdeveloped markets but not significantly influencing developed markets (Mai, 2020).

In Brazil, Pellicani (2017) investigated how corruption affects the investment decisions of publicly traded Brazilian organizations and concluded that country-level corruption impairs the investment decision-making of Brazilian companies. Araújo et al. (2018), in research on the effects of the Operation Car Wash scandal on market value, explain that the disclosure of corruption events is more relevant than the disclosure of mandatory events. The results indicate that the publicization of corruption acts has negative effects on cumulative returns.

Based on all the theoretical arguments and empirical evidence on the topic, it can be concluded that corruption substantially reduces investment, affecting financial performance and market value of companies, and consequently, the competitiveness of companies, regardless of whether the company operates in countries with high levels of corruption or not. In this sense, the following study hypotheses are formulated:

H1. There is a positive relationship between the level of corruption control in a country and the performance of companies located in that country.

H2. There is a positive relationship between the level of corruption control in a country and the market value of companies located in that country.

To support the research hypotheses, Table 1 below presents the main studies explaining the effect of corruption on corporate finance in different countries over the past two decades.

Table 1
Contribuições do debate empírico

Year	Author	Objectives	Econometric Method	Results
2002	Habbib & Zurawicki	Examine whether the country-level corruption affects foreign direct investment (FDI).	OLS and Probit Regression	Corruption is a serious issue for foreign investment.
2002	Gaviría	Analyze whether corruption and crime affect sales, investment growth, and employment at the company level.	Probit Regression	It concludes that corruption and crime substantially reduce sales growth.
2002	McArthur	Empirically investigate the importance of corruption on company performance in Africa, relating it to location and productivity per worker.	Panel Data Regression	Companies operating in economies with excessive bribery have, on average, only one-third of the productivity compared to their counterparts operating in bribery-free environments.
2005	Garmaise & Liu	Relate the Beta value to corporate corruption.	OLS Regression	The results suggest that corruption increases the cost of doing business and can have long-term impacts on competitiveness and company growth.

2007	Fisman & Svensson	Study whether there is a relationship in Ugandan companies between bribery, taxation, and company growth.	OLS Regression	They demonstrate a strong, robust, and negative relationship between bribery rates and short-term growth rates of Ugandan companies.
2014	Donadelli et al.	Examine the relationship between corporate governance and financial performance, using a perspective of country and sectors	OLS Regression	At the country level, it is found that corruption has (on average) a negative impact on stock returns
2017	Pellicani	Investigate how corruption affects the investment decisions of publicly traded Brazilian companies.	Panel Data Regression	The results show that corruption makes investment sensitivity to cash flow strongly negative.
2018	Curti & Mihov	Analyze fraud recovery and the quality of country governance.	OLS Regression	It concludes that country governance characteristics can have a significant impact on fraud-related loss outcomes.
2018	Araújo et al.	Identify the effects of corruption event disclosures on the market value of companies listed on the Brazilian Stock Exchange, especially related to Operation Car Wash	Event Studies	The results indicate that Operation Car Wash had a negative impact on the companies involved, a positive effect on companies in the same sector, and no impact on non-involved companies
2019	Ojeka et al.	Analyze the relationship between corruption perception, institutional quality, and performance of listed companies in Nigeria.	Multiple Regression	High corruption perception is associated with lower company performance; robust institutional quality is associated with better business performance.
2020	Mai	Investigate the relationship between corruption and stock market development in Asia-Pacific (APAC) countries.	Panel Data Regression	Corruption is negatively associated with stock market development.
2022	Dong et al.	Investigate the effect of local corruption on corporate dividend policy, both theoretically and empirically.	Panel Data Regression	The research reveals that local corruption negatively affects corporate dividends, especially in state-owned enterprises and regions with a more robust legal environment..

As pesquisas comprovam que a corrupção acarreta em redução do investimento (Pellicani, 2017; Fisman & Svensson, 2007), impacta negativamente no desempenho financeiro (Garmaise & Liu 2005; Donadelli et al., 2014) e valor de mercado (Liew & Stevens, 1996; Araújo et al., 2018). A seguir, organizam-se as etapas metodológicas para alcançar o objetivo proposto pela pesquisa. Sobre o método escolhido, é importante ressaltar que nenhuma das pesquisas citadas utilizou a

regressão multinível, um indicativo da originalidade desta pequisa.

3 METHODOLOGICAL PROCEDURES

This study aims to analyze the relationship between the level of corruption in Latin American countries and the financial performance and market value of major companies in these countries, using a quantitative approach. The following outlines the planning to achieve these objectives.

3.1 Sources and Sample Data

Regarding the sample, this research studies the markets of Latin American countries. In this context, the countries with the best data quality were selected to participate in this study: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Jamaica, Mexico, and Peru, for the period from 2012 to 2022. Data was collected from the Refinitiv Eikon financial information platform and converted to dollars for standardization. Companies in the financial sector and investment funds were excluded from the analysis due to their distinct financial, operational, and investment activities compared to other sectors. It is noteworthy that the countries under analysis did not fully adopt IFRS throughout the entire period of study, which complicates comparability and the use of a larger number of control variables.

Companies with negative operating revenue, missing information on fixed assets, performance, and other control variables were removed from the sample. Following the guidelines of Almeida et al. (2004) to mitigate the impact of outliers, a winsorization methodology at 2.5% on both tails was adopted to correct for outliers, which were identified using boxplot graphs for the dependent and control variables in this study.

3.2 Corruption Measurement

Corruption is the primary variable in this study, but it is challenging to detect. Both perpetrators and beneficiaries of corruption tend to conceal their activities. An objective instrument for quantifying corruption at the company level would be ideal for this study; however, such a metric has not yet been developed in the literature.

For measuring corruption in the countries under study, this research will follow the approach used by Pellicani (2017), Donadelli et al. (2014), and Ahmed (2020). The Corruption Control Index by Kaufmann, Kraay, and Zoido-Lobaton (KKZ), employed by the World Bank to compile the Worldwide Governance Indicator (WGI), will be used. This measure captures respondents' perceptions of how public power is utilized for private gain and how agents can make public money favor private interests. The KKZ index, with its percentile ranking, reflects the degree of corruption, where higher values indicate less corruption and better governance (Pellicani, 2017).

The corruption index utilized in this study is comprised of 194 different measures drawn from 17 various data sources, built by 15 organizations, including indicators. This index captures expert perceptions and other business entities' evaluations, measuring the degree of corruption in specific countries, as well as the political conditions for business stabilization and the effectiveness of service provision, particularly public services. The KKZ corruption index uses a percentile ranking among all countries, ranging from 0 (lowest) to 100 (highest). Higher percentage values in the index for a given country indicate that the country is less corrupt and better governed.

3.3 Data Analysis and Treatment

It is essential to conduct a descriptive statistical analysis of the variables in models (M1 ROA) and (M2 MARKET VALUE), with the goal of relating them to the corruption index

proposed by the World Bank. Hair Jr. et al. (2005) emphasize the importance of descriptive statistics in research, as it allows for efficient summarization and presentation of data, facilitating the understanding and analysis of results.

The performance of a company can be studied from various perspectives. The quantitative method using linear regression modeling is one of the most commonly employed statistical techniques for investigating profitability and its relationship with variables to explain performance. According to Moori et al. (2008), it is not possible to draw conclusions about the individual behavior of variables solely from data subjected to linear regression, even when observing a hierarchical structure in the population from which the data were collected.

For this reason, the study employs a multilevel regression model, treating both the intercept and the slope coefficients as random variables. This approach allows for the variability of estimates across different groups. The Multilevel Linear Regression, also known as Hierarchical Linear Regression, specifically uses a fixed-effects model for variance components (Laros & Marciano, 2008).

This method proposes to decompose the variance of the intercept into different variance components according to hierarchical levels. That is, the model assumes that the corruption intercept, as explained by Laros and Marciano (2008), varies across Latin American countries, even when the regression coefficients for performance, investment decisions, and control variables remain fixed.

The choice of the model, as indicated by Hair Jr. et al. (2005) and Laros and Marciano (2008), suggests that when samples can be separated into levels, the Multilevel Regression model should be chosen. According to Laros and Marciano (2008), this type of regression corrects standard errors, confidence intervals, and hypothesis tests, while also allowing for the investigation of individual and contextual effects. Additionally, it accommodates intragroup correlation and models complex variance structures.

Hierarchical models have the following advantages due to their data clustering structure: (a) they are well-structured models that can provide an equation for each country, allowing for individual analyses for each group; (b) the data clustering allows testing of effects between levels; and (c) it enables responses at each country level. For this paper, the Hierarchical Linear Model was used, following the approach of Kayo and Kimura (2011). The alignment was done in the same manner as by the authors: the first level was composed of time variables, the second level included company-specific variables, and the third level comprised country-level variables. Finally, it is noted that the data is in a balanced panel format.

In addition to parameter estimation, it was necessary to report the model fit statistics. For this reason, variance tests such as AIC (Akaike Information Criterion) and BIC (Bayesian Information Criterion) were conducted, which provide essential information for comparing different models.

The analysis will use a balanced panel. This approach aims to significantly enhance data reliability by providing a complete and structured dataset for analysis. This completeness allows for a more accurate representation of trends and patterns over time, reducing uncertainties in the predicted results and indicating greater statistical efficiency (Son et al., 2021).

3.4 Description of Variabless

To test the research hypotheses, the dependent variables of performance (ROA and Market Value), the independent variable (country-level corruption), and the control variables (size and leverage) are used to explain how corruption control influences the performance and market value of companies.

To meet the study's objectives and use the proposed methodology, it is essential to understand that regression results explain the dependency of a variable on one or more independent and explanatory variables, with the purpose of predicting the relationship between these variables

to explain the phenomenon. This would be the case, for example, in this article, as it attempts to explain the impacts of corruption on the performance and market value of companies in Latin American countries.

In Table 2. the dependent, independent, and control variables that make up this model, related to the Latin American companies under study in this article, are presented.

Table 2
Descriptions of Study Variables

Variables	Measurement Methods		Base Studies
Dependent (M1)	**Performance**		
ROA	Return on Equity		Donadelli et al. (2014); Zhou et al. (2018)
Dependent (M2)	**Market Value**		
VMERCADO	Enterprise Value = Market Capitalization + Net Debt		Araújo et al., (2018); Dong et al. (2022)
Independent	**Corruption Control Level**		
RCORRUP	Corruption Control (World Bank)	Expected Sign +	Pellicani (2017); Donadelli et al. (2014)
Independents	**Control Variables**		
ENDIV	Leverage: Total Debt	Expected Sign -	Donadelli et al. (2014); Pellicani (2017)
TAM	Size (Log of Total Assets)	Expected Sign +	Pellicani (2017); Zhou et al. (2018)

Source: Prepared by the authors.

Laros and Marciano (2008) caution that using multiple regression in some studies, such as in social and human sciences, can present issues, especially when data are collected from people grouped in clusters. However, this issue is not present in this study, as data were collected from multiple countries, each with different market structures and regulations. To address this, this article adjusted variance component models, considering two levels: the company level and the country level.

Multilevel regression is based on the variance component, which involves decomposing the variance of the intercept into distinct variance components for each hierarchical level. This model assumes that the intercept varies between countries, even though the coefficients are considered fixed. This research aims to identify the impact of country-level corruption on the performance and investment decisions of companies in several Latin American countries.

3.5 Operacionalização das variáveis

This study investigates whether the financial performance and investment decisions of companies are impacted over time by the country-level corruption. To achieve this objective, a hierarchical linear regression model, also known as a multilevel or mixed-effects model, will be used.

Regarding the choice of model, when the sample can be separated into levels, the Hierarchical Regression model should be used (Hair et al., 2005; Laros & Marciano, 2008; Fávero, 2010). Hierarchical regression allows for the investigation of fixed individual effects and random contextual effects (Fávero, 2010). This method proposes decomposing the variance of the intercept into different variance components according to the hierarchical level, meaning the model assumes that the intercept varies according to the level under study (Laros & Marciano, 2008).

For this paper, data collection was carried out at two levels: the first level is the companies,

and the second level is the countries. Each company is represented by index *i*, and index *j* represents each country in the study. Suppose *x* represents a variable at the company level and www a variable at the country level. According to Fávero (2010), the multilevel model will then have the following general expression:

$$yij = \beta 0j + \beta 1j\, xij + eij \quad (1)$$

$$\beta 0j = \gamma 00 + \gamma 01\, wj + u0j \quad (2)$$

$$\beta 0j = \gamma 10 + \gamma 11\, wj + u1j \quad (3)$$

Substituting (2) and (3) into (1) yields:

$$yij = \gamma 00 + \gamma 10\, xij + \gamma 01\, wj + \gamma 11\, wj\, xij + u1j\, xij + u0j + eij \quad (4)$$

In the model above, as noted by Fávero (2010), it is possible to observe the change from β to *γ,* in order to identify the model coefficients due to its multilevel interpretation. Thus, *yij* represents the average proficiency of the i-th company in the j-th country; β*0j* is the overall intercept of the model, defined as a random variable; β*1j* is the slope coefficient associated with the variable *x.*

Null Model (0): The null model, so called because it has no explanatory variables, is particularly important in studying the distribution of the total variance of the response variable. It replaces γ with the variables (ROA and Market Value) at the grouping levels. It was specified as an adapted model from Moori et al. (2008).

Null Model (Model 1): Absence of independent variables:

$$ROAij = u0j + eij \quad (5)$$

Null Model (Model 2): Absence of independent variables:

$$VMERCADOij = u0j + eij \quad (6)$$

Full Model (Model 1): Built upon the Null Model (0) by including the variable YEAR at Level 1. as follows:

$$ROAij = \pi 0j + \pi 1j * YEAR + CONTROL + RCORRUP\, eij \quad (7)$$

Full Model (Model 2): Built upon the Null Model (0) by including the variable YEAR at Level 1. as follows:

$$VMERCADOij = \pi 0j + \pi 1j * YEAR + CONTROLE + RCORRUP\, eij \quad (8)$$

According to Fávero (2010), estimating the company and country effects requires a two-level model, with *j* countries at Level 2 and *i* companies at Level 1. In this case, each company unit *i* is aligned with each country *j.*

To test the model fits, intraclass correlation tests were used for pairs of responses at each nested level of the model. Intraclass correlations are available for random intercept models or for conditional random coefficient models with random effect covariates equal to 0. The higher the value, the greater the proportion of variance attributable to the second level. These results confirm the choice of the multilevel model over the classical regression model.

4 RESULTS

4.1 Descriptive Analysis

In Table 3. an attempt was made to describe the statistical summary of the Corruption Control Level assigned to the countries in the study, obtained through the Worldwide Governance Indicators (WGI). The WGI is a research dataset that summarizes the views on governance quality provided by numerous respondents, including businesses, citizens, and experts in developing countries. This data is collected from various research institutes, non-governmental organizations, international organizations, and private sector companies.

The following are the descriptive statistics for the control of corruption level for each of the 10 countries analyzed in this study. This allows us to infer which countries are better positioned regarding the control of corruption index.

Table 3

Descriptive Statistics for Corruption Control (WGI) by Country

Variáveis do Nível 1 (país, controle de corrupção)					
Country	**Obs**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Argentina	698	42.90	6.578	33.81	53.81
Bolívia	128	22.86	2.913	20.48	26.62
Brazil	2.346	40.70	7.493	32.08	56.40
Chile	1.420	84.11	4.175	80.48	91.00
Colombia	442	42.06	1.771	40.28	46.19
Costa Rica	42	69.98	3.666	64.29	75.00
Ecuador	8	31.15	2.030	29.52	34.76
Jamaica	270	50.99	2.626	47.14	54.25
Mexico	1.199	21.35	6.743	16.19	37.91
Peru	946	33.69	5.503	22.17	43.13

Source: Research Data. *obs: Number of Observations for Each Variable.

Notes. This table reports the sample distribution of corruption control levels by country, with 0 representing the lowest level and 100 representing the highest level of corruption control.

According to Table 3, the percentage classification reflecting the perception of corruption control in each country shows significant heterogeneity among Latin American countries. Chile and Costa Rica have higher values, approaching those of developed nations. In contrast, the other countries have averages below 50%. Rotberg (2019) attributes this positive difference for Chile and Costa Rica to lower corruption levels among political leaders and large corporations, especially compared to other countries in the region. The following section presents the descriptive statistics for company-level variables. Preliminary analyses suggest that the sample selection for this research was appropriate.

Table 4
Descriptive Statistics of the Model Variables: Performance (ROA) and (Market Value-VMERCADO)

Level 2 Variables (company)					
Variable	**Obs.**	**Mean**	**Standard Deviation**	**Minimun**	**Maximum**
ROA	7.500	4.317	9.785	-37.200	20.570
VMERCADO	7.500	19.681	2.177	-53.690	45.180
ENDIV	7.500	133.814	31.516	0.100	118.6
TAM	7.500	20.555	2.151	8.05	17.09

Source: Research Data. *obs: Number of Observations for Each Variable.

Note that the dependent variable, return on assets (ROA) of companies in the sample, has a mean of 4.31, indicating a positive return on assets and profitability for the countries in the sample. The high standard deviation may indicate dispersion in the values, showing that some companies have an ROA significantly higher than the average. The relatively low value for ROA aligns with Donadelli et al. (2014); according to these authors, corruption has a negative impact on stock returns.

The other dependent variable, market value, is even higher, with a mean of 19.68, indicating a positive market value even in Latin American countries. The control variable, leverage, is also high, likely due to it being a characteristic of developing countries like those in the sample. Caldentey et al. (2019), in a study with 2,241 companies in Latin American countries, explain that high corporate leverage in these countries may be related to the issuance of public bonds.

The size of the company was represented by the natural logarithm of the assets of the companies in the sample; the standard deviation indicates little variability in size among the companies in the sample. The statistical values confirm the theoretical understanding of developing countries, especially those within the Latin American block. The following is the correlation matrix for the proposed models. The matrix will allow for a quick visualization of which variables are related to each other and the strength of these relationships. This can be useful for identifying variables that should not be included in the model.

Table 5
Correlation Matrix for ROA Model

Variáveis	ROA	CORRUP	ENDIVT	LNATIVO
ROA	1.000			
RCORRUP	0.0456*	1.000		
ENDIV	-0.1026*	-0.0360*	1.000	
TAM	0.0654*	-0.0047*	0.0591*	1.000

Source: Research Data. * Correlation is significant at the 0.10 level.

A positive and significant correlation between ROA and CORRUP (0.0456) indicates that companies with higher levels of corruption control tend to have higher ROA, consistent with the research by Donadelli et al. (2014). A negative and significant correlation between ROA and debt (-0.1026) suggests that companies with higher levels of debt tend to have lower ROA. This relationship between debt and ROA can be explained by the increased financial costs for indebted companies due to interest and amortizations, which can reduce their net profit. The positive and significant correlation between ROA and company size (0.0654) indicates that larger companies tend to have higher ROA. According to Shahfira and Hasanuh (2021), company size positively influences ROA, suggesting that larger companies are generally more profitable due to economies of scale and better resource allocation.

Table 6
Correlation Matrix for MARKET VALUE MODEL

Variables	MARKET VALUE	CORRUP	ENDIVT	LNATIVO
VMERCADO	1.000			
RCORRUP	0.0606*	1.000		
ENDIV	-0.0080	-0.0368*	1.000	
TAM	0.8340*	-0.0047*	0.0591*	1.000

Source: Research Data. * Correlation is significant at the 0.10 level.

Note that for the relationship between market value and corruption control, the correlation is positive and significant (0.0606). This indicates that companies with a higher level of corruption control tend to have a higher market value. This relationship can be explained by the loss of investor confidence in corrupt companies, which may lead to a decline in stock prices.

The negative correlation between debt and market value is not significant (-0.0080), indicating that there is no clear relationship between the level of debt and the market value of companies. These results are only indicative in the case of a simple regression between the variables. It is important to note that this research uses a multilevel regression approach, and the results and inferences are likely different. This study understands that the correlation results are merely for guidance and probably require additional analyses, such as the multilevel analysis proposed in this research.

4.2 Multilevel Regression Analysis

n this model, three parameters were estimated: the intercept, the variance of residuals at the country level, and the variance of residuals at the company level. The variation in the intercept reflects the variability between company-level and country-level for the performance (ROA) and market value variables.

The null model highlighted the variance in residuals at both the macro (country) and micro (company) levels. To complete the methodology, explanatory variables were subsequently included at the company level, as suggested by the literature, including corruption, debt (Donadelli et al., 2014), liquidity (Bastos et al., 2016), market-to-book (Chen & Zhao, 2006), and size (Pellicani, 2017; Zhou et al., 2018).

Tables 7 and 8 present the results of the null (or empty) models, which consider company and country-level variables (corruption control) through the intercepts for all performance and investment decision indicators. The null model, which includes no explanatory variables, is important because it allows us to determine the relative importance of each level in explaining the variance in leverage. This is done through the Intraclass Correlation Coefficient (ICC), which represents the variance decomposition of performance and investment decision across the levels.

Table 7
Multilevel Regression Results (ROA)

Variable	Coefficient	Standard Error	z	P>	z
Control of Corruption (RCORRUP)	64	15	-4.27	0	Country
Debt (ENDIVT)	-65	11	-5.91	0	Company
Inactivity (TAM)	23	129	-0.18	857	Company
Year (ano)	336	12	27.92	0	Time
Standard Deviation	-	-	-	-	-
- Random Effect (Country) (sigma_u)	6.612	-	-	-	Country
- Random Effect (Company) (sigma_e)	6.7655	-	-	-	Company

Model	Obs.	ll (model)	df	AIC	BIC
	7.500	-27566.32	10	55152.63	5521.86

Source: Research Data.

The coefficient for control of corruption (RCORRUP) is positive and significant, indicating that greater control of corruption is associated with higher profitability (ROA) for companies. A one-unit decrease in the corruption control index is associated with an average reduction of 0.0064 units in ROA (indicating that corruption reduces ROA). This result is consistent with the literature, which conceptualizes corruption as rust or sand in the gears, confirming its negative impact on company performance.

Regarding the coefficients for the control variables of debt (ENDIVT) and company size (TAM), the results show that the relationship for debt is negative and significant, indicating that companies with higher debt levels tend to have lower profitability (ROA). The coefficient for total assets (TAM) is positive but not significant, indicating no clear association between size and ROA, contrary to the common belief that larger size would represent higher profitability for companies in the analyzed markets.

Note that the coefficient for the year is positive and significant, indicating that the ROA of companies tends to increase over time. An increase of one year is associated with an average increase of 0.0336 units in ROA. Regarding the model fit, lower AIC and BIC values indicate a better fit of the model to the data. In this case, the model with explanatory variables has lower AIC and BIC values compared to the null model. This suggests that the model with explanatory variables fits the data better than the null model.

Table 8

Resultado da regressão multinível (VMERCADO)

Variable	Coefficient	Standard Error	z	P>	z
Control of Corruption (RCORRUP)	16	2	8.00	0	Country
Debt (ENDIVT)	-19	1	-19.00	0	Company
Inactivity (TAM)	9.250	129	71.70	0	Company
Year (ano)	3	1	3.00	3	Time
Standard Deviation	-	-	-	-	-
- Random Effect (Country) (sigma_u)	780	-	-	-	Country
- Random Effect (Company) (sigma_e)	1.0651	-	-	-	Company
Model	Obs.	ll (modelo)	df	AIC	BIC
	7.500	-27566.32	10	22694.2	22763.42

Source: Research Data.

Regarding the relationship between corruption and market value, the coefficient for corruption control (RCORRUP) is significantly positive, indicating that higher corruption control is associated with a higher market value (VMERCADO) of companies. A one-unit decrease in the corruption control index is associated with an average decrease of 0.0016 units in market value. This result is consistent with the literature, confirming that greater corruption control correlates with a better market value for organizations.

The coefficients for debt control (ENDIVT), which are negative and significant, along with the positive and significant coefficient for company size (TAM), confirm the fit of the variables, showing the expected signs as indicated in Table 2 of this research.

Regarding the model adjustment with AIC and BIC, as with the ROA model, the AIC and BIC values are lower in the complete model than in the null model, indicating the effectiveness of the variables in the model. In this sense, it is also possible to compare the ROA model with the

VMERCADO model, since AIC and BIC are values that should be minimized. In other words, models with lower AIC and BIC values for the VMERCADO model compared to the ROA model show a better fit, suggesting that the control of corruption has a stronger relationship with market value than with asset profitability.

This study finds significant results regarding corruption control. It is possible to conclude that in countries with better rankings in corruption protection, companies exhibit higher performance and market value. These results confirm the predominant theory that corruption is detrimental to firms, as predicted by Murphy et al. (1993), Mauro (1995), and Habbib & Zurawicki, (2002).

These results confirm the research hypotheses and provide a notable theoretical contribution by establishing a quantitative link between the social factor of corruption (environment) and organizations. The analysis of financial performance shows that market value increases with better corruption control. Ahmed (2020) explains that the effect of corruption is stronger in countries with weak institutional frameworks and in countries with high *per capita* income. The results indicate that country-level corruption control can benefit company profitability and market value, especially in Latin American countries. Reducing corruption is urgent, particularly in developing regions like those examined in this study. Corruption control is positively related to company performance, as companies in low-corruption environments tend to perform better (Magerakis & Tzelepis, 2023).

5 FINAL CONSIDERATIONS

The goal of this research is to investigate whether companies in Latin American countries have their financial performance and market value influenced by the level of corruption control. The study concluded that corruption, perhaps as old as humanity itself, remains a widespread phenomenon that affects the lives of people, nations, and civilizations worldwide (Ahmed, 2020).

The results indicate that corruption is a systemic problem that negatively impacts the development of companies in various countries, particularly in Latin America. Companies in countries with higher corruption control exhibit a higher ROA, meaning they are more efficient in using their assets to generate profit. They also have a higher market value, as investors recognize the value of operating in an environment with lower corruption risk and are willing to pay more for the shares of these companies.

Corruption control creates a more transparent and predictable business environment, benefiting companies in various ways. According to Magerakis and Tzelepis (2023), company performance is positively related to institutional corruption control, indicating that companies perform better in low-corruption environments. This suggests that corruption control is crucial for the development of businesses in Latin American regions, especially in countries like Bolivia and Mexico, which exhibit lower corruption control compared to others in this study. Strengthening institutions and mechanisms to combat corruption, promoting transparency and access to information, encouraging a culture of ethics and compliance within companies, and educating society about the negative impacts of corruption are essential measures to create a healthier and more competitive business environment in the region. Effective corruption control is linked to economic growth, particularly in developing countries, where it enhances the positive effects of stock market development and trade openness (Van Thi Hong, 2020).

The results are consistent with the current literature, demonstrating significant findings regarding financial performance and market value in Latin America, a region sensitive to corruption. Considering the theoretical background and referencing key studies on corruption, it is possible to deduce that corruption affects performance and market value, as observed by Garmaise and Liu (2005), Donadelli et al. (2014), and Lin et al. (2016). This paper aligns with the "Wheel-Licking Hypothesis" (SWH) theory, which characterizes corruption as an obstacle to

development and economic growth.

The main limitation of this study, similar to Botn and Dahl (2015), is the level of corruption in a country, which often conflates with the level of economic development and the country's corruption level. For future research, it is proposed that the insights presented be used to conduct similar studies in other regions, comparing financial performance and market value, to gain a better understanding of the complexities of global corruption. Another limitation is the use of countries that do not fully adopt IFRS standards, which complicates comparability and reliability between countries.

The variability in accounting and market indicators caused by corruption is more than sufficient to explain the need and utility of this topic for stakeholders. It is crucial to understand the strong relationship between the social factor of corruption, decision-making, and company performance.

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CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest regarding this submitted work.

AUTHOR CONTRIBUTIONS

Contributions	1st Author	2nd author	3rd author
Conception	♦	♦	♦
Data Curation	♦	♦	♦
Formal Analysis	♦	♦	♦
Funding Acquisition		♦	
Investigation	♦	♦	♦
Methodology	♦	♦	♦
Project Administration	♦	♦	♦

Resources	♦	♦	♦
Software	♦	♦	♦
Supervision	♦	♦	♦
Validation	♦	♦	♦
Visualization	♦	♦	♦
Writing – Initial Draft	♦	♦	♦
Writing – Revision and Editing	♦	♦	♦

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