INSTITUTIONAL MATRIX AND RELEVANCE OF ACCOUNTING INFORMATION

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SUMMARY

The purpose of this study was to verify the relationship between the institutional matrices in the relevance of accounting information in the 20 economies that had the highest market capitalization in 2018. The sample consisted of 2,542 companies during the period from 2010 to 2018, totaling 20,002 observations for the entire period analyzed. The variables used for the relevance of accounting information were Earnings Per Share and Shareholders' Equity Per Share, for Corporate Governance the variable G of the Environmental Social and Governance (ESG) index was adopted and for the institutional matrices the six individual variables of the Word Governance Index (WGI). The data were analyzed using hierarchical linear models with repeated measures (HLM3). The results of the research indicate that corporate practices are aligned with the institutions of the different economies, that is, that the rules and sets of rules of the countries exert influence on governance structures. In addition, institutional matrices improve the relevance of accounting information. Thus, it is concluded that, in the same way that accounting information reduces uncertainty, it transmits signals to the market and this transmission becomes stronger in countries with better institutional levels.
Keywords: Relevance of Accounting Information. Institutional Matrices. Hierarchical Linear Regression Model.

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MATRIZ INSTITUCIONAL E RELEVÂNCIA DA INFORMAÇÃO CONTÁBIL: UM ESTUDO MULTINÍVEL NAS 20 MAIORES ECONOMIAS

RESUMO

A proposta desse estudo foi verificar a relação entre as matrizes institucionais na relevância da informação contábil nas 20 economias que tiveram maior capitalização de mercado em 2018. A amostra foi composta por 2.542 empresas durante o período de 2010 a 2018, totalizando 20.002 observações para todo o período analisado. As variáveis utilizadas para a relevância da informação contábil foram o Lucro Por Ação e o Patrimônio Líquido por Ação, para a Governança Corporativa adotou-se a variável G do índice Environmental Social and Governance (ESG) e para as matrizes institucionais as seis variáveis individuais do Word Governance Index (WGI). Os dados foram analisados por meio de modelos hierárquicos lineares com medidas repetidas (HLM3). Os resultados da pesquisa apontam que as práticas corporativas estão alinhadas com as instituições das diferentes economias, ou seja, que as regras e os conjuntos de regras dos países exercem influência nas estruturas de governança. Adicionalmente, as matrizes institucionais melhoram a relevância da informação contábil. Sendo assim, conclui-se que do mesmo modo que as informações contábeis reduzem as incertezas, as mesmas transmitem sinais ao mercado e essa transmissão passa a ser mais forte em países com melhores níveis institucionais.

Palavras-Chave: Relevância da Informação Contábil. Matrizes Institucionais. Modelo de Regressão Hierárquica Linear.

1 INTRODUCTION

The economic and social environment is permeated by uncertainties and, due to the large amount of information, economic agents do not have the capacity to obtain and process all relevant information for decision making (Melo & Fucidji, 2016). From the moment that economic agents do not know the world on which they must decide, they create institutions to reduce uncertainties in interactions between people by establishing common bases of beliefs and rules (North, 1990). An institution can be a rule, norm, laws, constitutions, codes of conduct, religion, political and economic systems (North, 1990; Gala, 2003) and the key point for its existence is to reduce uncertainty, reduce transaction costs, guarantee property rights and the contractual length of economic relations. (North, 1990; Filártiga, 2007).

In turn, the set of institutions of an economy form the institutional matrix of countries (North, 1990). That is, societies have institutional matrices that are formed by institutions, which, in turn, are formal and informal rules, written or unwritten - such as the legal system, understanding of morality, corruption, religion, culture, codes and ethics, among others (Aguilhera & Jackson, 2010; Kaufmann, Kraay & Mastruzzi, 2011). Previous studies have shown that some elements of institutional matrices affect the Relevance of Accounting Information (Dal Maso, Liberatore & Mazzi, 2017; Batistella, Dal Magro, & Mazzi, 2017)., Mazziono & Paulo, 2021).

This influence occurs because the institutional matrices influence the reality of organizations, since they follow the set of rules and norms to define what is

legitimate or not. Habib and Azim (2008) point out that due to the existence of Corporate Governance (CG) mechanisms, financial reports are more relevant, because with the separation between ownership and control - agency conflict - asymmetric information arises that managers could use to expropriate shareholder wealth (Berle & Means, 1932; Jensen & Meckling, 1976). The relevance of accounting information is the ability of accounting numbers to provide inputs to financial market analysts and stakeholders to make their financial projections. Thus, one of the most important functions of corporate governance is to ensure the quality of this information (Hendriksen & Breda, 1999; Fiador, 2013). Lopes (2002, p. 68) adds that "the relevance of the information emanating from accounting cannot be fully assessed without considering corporate governance mechanisms". For La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) this relevance occurs because investors use the financial statements to compose their projections.

The relationship between accounting information and cultural elements has already been studied (Dal Maso, Liberatore, Mazzi, 2016; Batistella, Magro, Mazzioni & Paulo, 2021), and some studies indicate that corporate governance is influenced by the elements of institutional matrices (Silveira, 2002; Silveira, 2005; Terra & Lima, 2006; Lopes, 2009; Armstrong & Guay, 2010). However, the relationship between corporate governance at the firm level and institutional matrices at the economy level with the relevance of accounting information has not been properly explored. Previous studies have focused on the relationship of some elements of institutional matrices in isolation and have not considered corporate governance. Corporate governance increases the relevance of accounting information and this, in turn, is influenced by institutional matrices. Thus, this paper aims to investigate the influence of institutional matrices on the Relevance of Accounting Information disclosed to the capital market.

The motivation for the study stems from two central elements. First, between 1978 and 2008 there was a 19% growth rate in the number of Corporate Governance codes in the world (Aguilhera & Cuervo-Czurra, 2009). Of the total 196 codes in 2008, the US and UK accounted for 26%. Second, accounting information is the one that has the greatest ability to explain changes in stock prices, as stock prices reflect the expectation of future cash generation, the more correlated prices are with accounting information means that the information will be closer to the economic reality of the business. Takamatsu (2014) studied this relationship and concluded that there is a relationship between elements that make up the institutional matrix and stock prices.

To verify the motivation of the study, data were collected from 2,542 companies distributed in 20 countries. The Ohlson (1995) model was used to verify the relevance of information. As a method of analysis, the hierarchical linear regression model with repeated measures (HLM3) was used. The choice was due to the nature of the data (companies from different countries analyzed over a period of time).

The evidence suggests that from the composition of institutional matrices, companies present more relevant information, that is, closer to their economic reality, which reduces information asymmetry. In this sense, the results pointed out that the institutional matrices, which mark the heterogeneity of economies, combined with corporate governance result in differentiated effects on the

relevance of accounting information. Thus, as the institutional matrices differ in economies, corporate governance practices are differentiated and investors perceive greater or lesser relevance in accounting information and may or may not use such information as central elements in their decision making.

The findings provide support for the relevance of accounting information to be assessed in conjunction with the institutional context of each country as well as corporate governance mechanisms. In this line, the market, when evaluating the information disclosed by companies, it is essential to evaluate the environment in which this information is generated, as it has greater or lesser relevance depending on the institutional context.

2 DEVELOPMENTS OF THE HYPOTHESIS

The concept of institutional matrices is found in the work of North (1990) when discussing the set of institutions present in societies. Institutional matrices are the set of institutions, and these, in turn, are the rules and sets of rules present in societies (North, 1990). Laws, regulations, corruption, accountability, formal processes, and norms are some characteristics of institutional matrices (Daniel, Cieslewicz & Pourjalali, 2012).

Corporate governance provides mechanisms to monitor the management and performance of organizations, through monitoring mechanisms of managers and becoming relevant for reducing information asymmetry (Nascimento & Reginato, 2008). Thus, the general objective of CG mechanisms is to reduce agency problems, align the interests of managers and shareholders, and thus improve the value of the company (Jensen & Meckling, 1976; Fama & Jensen, 1983). In this line, studies indicate that there is a relationship between the elements of institutional matrices and corporate governance (Aguilhera & Cuervo-Cazurra, 2004; Khadaroo & Shaikh, 2007; Li & Harrison, 2008; Zattoni & Cuomo, 2008; Daniel, Cieslewicz & Pourjalali, 2012; Reddy & Sharma, 2014; Volonté, 2015; Humphries & Whelan, 2017).

This relationship occurs because organizations are present in an environment with several institutional matrices. These matrices, in turn, influence organizations as they seek to adopt legitimate practices. Of these practices, Corporate Governance is one of them, that is, the institutional matrices shape the CG structures adopted by companies (Silveira, 2005; Terra & Lima, 2006). Thus, the first hypothesis of this work is presented:

H1– Institutional matrices are relevant to explain the variability of corporate governance.

Hendriksen and Breda (1999) point out that there are many definitions of the relevance of accounting information, however, the IFRS assumes relevance as the ability of information to make a difference in a decision. In this perspective, the relevance of information occurs with the relationship between accounting information and prices traded in the stock market, which can be investigated through statistical and econometric models (Lopes & Martins, 2007; Barth, Beaver & Landsman, 2001; Beisland, 2009). In other words, relevant information is that

reliably measured information that is reflected in stock prices and results in the evaluation of the company by investors (Barth, Beaver & Landsman, 2001).

Numerous studies around the world have found evidence that corporate governance increases the relevance of accounting information, in Australia (Habib & Azim, 2008); Canada (Berthelot & Morris, 2008); Malaysia (Jamaluddin, Mastuki & Ahmad, 2009; Morris, 2011); Brazil (Lopes, 2009); South Africa (Ntim, Opong & Danbolt, 2012; Tshipa, Brummer, Wolmarans & Toit, 2018); Ghana (Fiador, 2013); Pakistan (Malik & Shah, 2013; Khidmat, Wang & Awan, 2018); Sri Lanka (Balagobei, 2018) and Indonesia (Pratiwi, Sutrisno & Rahman, 2019). This is because governance mechanisms are assumed to restrict the opportunistic behavior of managers and make accounting information more relevant and credible to investors (Habib & Azim, 2008). Thus, the second hypothesis is presented:

H2 – In the presence of corporate governance at the firm level, accounting information has a higher degree of explanation of the variability of stock prices between firms in the same country and between firms in different countries.

In this sense, the confirmation of H1 and H2 points out that institutional matrices influence the relevance of accounting information through governance. Thus, as corporate governance mechanisms are dynamic and differ according to the institutional environment, the relevance of accounting information, as it is influenced by corporate governance, is dynamic as the institutional environment differs between countries. That is, corporate governance is the channel of influence of the relationship between institutional matrices and the relevance of accounting information. In this sense, the following hypothesis is formulated:

H3 – Institutional matrices are relevant to explain stock price variability.

3 METHODOLOGICAL PROCEDURES

For the operationalization of information relevance, we adopted the variables used in the Ohlson model (1995). The model used in this research follows the construction presented by Barth, Landsman, and Lang (2008), which considers Earnings per Share (EPS) and Shareholders' Equity per Share (EPS) as independent variables. For the dependent variable, the share price was used three months after the end of the fiscal year (Habib & Azim, 2008; Mechelli & Cimini, 2018). In addition, we used the control variables Total Assets and Total Revenue (Habib & Azim, 2008). At the institutional level, we adopted the variables of the World Governance Index (WGI) to capture the effects of institutional matrices. This index was developed by Kauffman, Kraay and Zoido (1999) and is currently based on 30 individual surveys of various entities around the world. From the 30 surveys, the variables are transformed into six constructs: Voice and Accountability (VA), Political Stability (PS), Government Effectiveness (GE), Regulatory Quality (RQ), Corruption Control (CC) and Rule of Law (RL). Additionally, Foreign Direct Investment (FDI), Gross Domestic Product (GDP) and Country Risk (CDS) were used (Batten & Vo, 2009; Robu, Carp, Istrate, Popescu & Robu, 2016; Paredes & Oliveira, 2017). Table 1 presents the summary of the variables that were used in the study.

Variable	Acronym	Expected Signal	Author	Source
Dependent				
Stock Price	P			Thomson Reuters
Independent				
Earnings Per Share	EPS	+/-	Peixoto, 2018; Barth, Li & McClure, 2019	Thomson Reuters
Book Value Per Share	BVP	+/-	Peixoto, 2018; Barth, Li & McClure, 2019	Thomson Reuters
Corporate Governance	GOV_CIA	+	Habib & Azim, 2008; Fiador, 2010; Mechelli & Cimini, 2018; Aguilhera & Cuervo-Cazurra, 2004; Reddy & Sharma, 2014; Berthelot & Morris, 2008; Lopes, 2009; Fiador, 2013; Malik & Shah, 2013;	Thomson Reuters
Voice and Accountability	VA	+	Daniel, Cieslewicz & Pourjalali, 2012; Volonté, 2015;	World Bank
Political Stability	PS	+	Li & Harrison, 2008; Daniel, Cieslewicz & Pourjalali, 2012;	World Bank
Effectiveness of Government	GE	+	Daniel, Cieslewicz & Pourjalali, 2012;	World Bank
Regulatory Quality	RQ	+	Mechelli & Cimini, 2018; Khadaroo & Shaikh, 2007; Zattoni & Cuomo, 2008; Daniel, Cieslewicz & Pourjalali, 2012;	World Bank
Controlling Corruption	CC	+	Mechelli & Cimini, 2018; Daniel, Cieslewicz & Pourjalali, 2012;	World Bank
Rule of Law	RL	+	Mechelli & Cimini, 2018; Aguilhera & Cuervo-Cazurra, 2004; Daniel, Cieslewicz & Pourjalali, 2012;	World Bank
Control				
Total Assets	ASSETS	+/-	Habib & Azim, 2008	Thomson Reuters
Total Revenue	REVENUE	+/-	Habib & Azim, 2008	Thomson Reuters
Foreign Direct Investment	FDI	+/-	Batten & Vo, 2009; Zheng, 2009	Unctad
Gross Domestic Product	GDP	+/-	Paredes & Oliveira, 2017; Caravalho et al 2013	Unctad
Country Risk	CDS	+/-	Robu et al., 2016; Zheng, 2009	Unctad

Figure 1 – Variables used in the study
Source: Prepared by the authors.

The sample consists of companies listed on the stock exchanges of the twenty countries with the highest market capitalization in 2018. The choice of countries occurred because these countries had a combined capitalization of US$ 63 trillion, which represents 94.4% of the world capitalization (World Bank, 2019). From this, it was verified how many companies have the governance variable available. In this study, the governance variable of the Environmental Social and

Governance (ESG) index was used. This variable was chosen due to the wide range of companies with the availability of such information. Although the ESG is an index, other studies have already used the individual variables and due to its worldwide coverage of countries and companies, it was decided to use it (Fauver & MacDonald, 2015; Homanem & Liang, 2018; Ahlklo & Lind, 2019). Thus, from the twenty countries, the sample consisted of 5,273 companies with the governance variable available. Companies that do not have data available for at least five years were removed (Fich & Shivdasani, 2006; Barth, Landsman & Lang, 2008). In addition, firms without information on assets, revenue and negative equity were excluded. Thus, the final sample consisted of 2,542 companies. The period of analysis was from 2010 to 2018. This choice was due to the limitation of available observations. In other words, when collecting data prior to 2010, few companies have governance information available, so for the panel structure this would make the sample more limited. (Khan, 2019).

For data analysis, the hierarchical linear regression model with repeated measures (HLM3) was used using Stata software. The choice was due to the nature of the data (companies from different countries analyzed over a period). Thus, in this study the model adopted was the three-level model, being: level 1 - time, level 2 - Firm and level 3 - Country. According to Courgeau (2003) The multilevel approach recognizes the grouping of individuals according to their groups and verifies the influence of these groups on individuals. Thus, the organization of data in a hierarchical way is also identified as a nested data structure (Fávero & Belfiore, 2017) and according to Fávero and Confortini (2010) multilevel models have the advantage of taking into account the analysis of hierarchically structured data. Regarding endogeneity, linear hierarchical models tend to reduce it due to the process of grouping and contextualizing the analyzed relationships (Bernardo, Albanez & Securato, 2018).

3. 1 Models Developed

Initially, to verify the temporal nesting of firms belonging to different countries with repeated measures, it is necessary to estimate a null model. According to Fávero and Belfiore (2017), the null model (non-conditional model) allows us to verify whether there is variability in the dependent variable between firms from the same country and between firms from different countries. In this model, no explanatory variable is inserted in the modeling, which considers only the existence of an intercept and error terms. u_{00k}, r_{ojk} and e_{tjk}, with variances respectively equal to τ_{u000}, τ_{ru000} e σ^2 (Fávero & Belfiore, 2017). The null model is then described:

$$Stock\ Price_{tjk} = \pi_{ojk} + e_{tjk} \quad (1)$$

In which:

$$\pi_{ojk} = b_{00k} + r_{0jk}$$

$$b_{00k} = \gamma_{000} + u_{00k}$$

Substituting the parameters results in:

$$Stock\ Price_{tjk} = \gamma_{000} + u_{00k} + r_{0jk} + e_{tjk} \quad (1.1)$$

In which: γ_{000}: fixed effect parameter at level 3 (country); u_{00k}: level 3 error term (country); r_{0jk} : level 2 error term (firm); e_{tjk}: level 1 error term (time).

From this model, we verify whether there is variability in stock prices between firms in the same country and between firms in different countries. The estimation of this model presents a fixed effect component and two random effects components, one corresponding to level 3 (country) and the other to level two (firm). The first check of the null model is through the intraclass correlation.

$$Level1: p = \frac{\sigma^2}{\sigma^2 + \tau_\pi + \tau_b}; Level2: p = \frac{\tau_{r000}}{\sigma^2 + \tau_\pi + \tau_b}; Level3: p = \frac{\tau_{\mu 000}}{\sigma^2 + \tau_\pi + \tau_b}$$

In which: σ^2: variance of the error term e_{tjk} level 1 (time); τ_{r000}: variance of the error term r_{0jk} level 2 (company); $\tau_{u000:}$ variance of the error term u_{00k} level 3 (country).

Next, the statistical significance of the variances is tested, if the variance of the error term/standard error ≥ 1.96 (1.96 being the critical value for a 5% significance level) it is concluded that the variance of the error term is statistically significant. This is the goodness-of-fit test of the hierarchical linear model with repeated measures (HLM3) (Fávero & Belfiore, 2017). Fávero and Belfiore (2017, p. 872) also point out that "this information is very important to support the choice of hierarchical modeling, to the detriment of a traditional regression modeling by MQO and is the main reason why a null model is always estimated in the elaboration of multilevel analyzes". Additionally, the likelihood ratio test is verified. Once the null model has been validated, we move on to the Linear Trend with Random Intercepts model (at level 1). In this model, the year variable is added to verify whether time is related to stock prices and whether stock prices exhibit linear behavior over time.

$$\text{Stock Price}_{tjk} = \pi_{ojk} + \pi_{1jk}\, .ano_{jk} + e_{tjk} \quad (2)$$

In which:

$\pi_{ojk} = b_{00k} + r_{0jk}$

$\pi_{1jk} = b_{10k}$

$b_{00k} = \gamma_{000} + u_{00k}$

$b_{10k} = \gamma_{100}$

Results in:

$$Stock\ Price_{tjk} = \gamma_{000} + \gamma_{100.} ano_{jk} + u_{00k} + r_{0jk} + e_{tjk} \quad (2.1)$$

The validation of this model follows the same procedure as the null model. At this point in the modeling, the outputs provide evidence that the stock price follows a linear trend over time, with significant variance of intercepts between those firms that belong to the same country and those that belong to different countries. Thus, it is also necessary to verify whether there is significant variance of stock price slopes over time between different companies (Fávero & Belfiore,

2017). Therefore, random slope effects are inserted at levels 2 and 3 of the multilevel model, which, with the maintenance of random intercept effects, has the following expression:

$$Stock\ Price_{tjk} = \pi_{0jk} + \pi_{1jk}.ano_{jk} + e_{tjk} \quad (3)$$

In which:
$\pi_{0jk} = b_{00k} + r_{0jk}$
$\pi_{1jk} = b_{10k} + r_{1jk}$
$b_{00k} = \gamma_{000} + u_{00k}$
$b_{10k} = \gamma_{100} + u_{10k}$

Thus, the linear trend model with random intercepts and slopes has the following notation:

$$Stock\ Price_{tjk} = \gamma_{000} + \gamma_{100}.yearjk + u_{00k} + u_{10k}.year + r_{0jk} + r_{1jk}.year + e_{tjk} \quad (3.1)$$

This model presents the components of fixed and random effects. According to Fávero and Confortini (2010), the inclusion of random effects helps to verify the existence of significant variability in the dependent variable over time between companies in the same country (level 2) and between companies in different countries (level 3). Therefore, from the validation of this model, the validation of the level 1 model is concluded. In the present research it means that the stock price shows variability over time, between firms in the same country and firms in different countries. After the validation of model 3.1, the modeling at level 2 begins to verify whether the variables at the firm level explain the variability of prices. At this point we include the variables Earnings Per Share (EPS), Book Value Per Share (BVP), Corporate Governance (GOV_CIA), Assets (ASSETS) and Revenue (REVENUE). Based on the literature on the relevance of accounting information, the numbers disclosed by accounting are relevant to explain stock prices. In this case, as prices suffer variability between firms and between countries and between firms in the same country, it is argued that the numbers disclosed by accounting are relevant to explain the variability between stock prices. Thus, the linear trend model with intercepts and random slopes at level 2 has the following expression:

$$Stock\ Price_{tjk} = \pi_{0jk} + \pi_{1jk}.year_{jk} + e_{tjk} \quad (4)$$

$$\pi_{0jk} = b_{00k} + b_{01k}EPS_{jk} + b_{02k}BVP_{jk} + b_{03k}GOV_{CIA\,jk} + b_{04k}BVPG_{jk} + b_{05k}EPSG_{jk} + b_{06k}ASSETS_{jk} + b_{07k}REVENUE_{k} + r_{0jk}$$

$$\pi_{1jk} = b_{10k} + b_{11k}EPS_{jk} + b_{12k}BVP_{jk} + b_{13k}GOV_{CIA\,jk} + b_{14k}BPSG_{jk} + b_{15k}EPSG_{jk} + b_{16k}ASSETS_{jk} + b_{17k}REVENUE_{k} + r_{0jk}$$

$b_{00k} = \gamma_{000} + u_{00k}$; $b_{01k} = \gamma_{010}$; $b_{02k} = \gamma_{020}$; $b_{03k} = \gamma_{030}$; $b_{04k} = \gamma_{040}$; $b_{05k} = \gamma_{050}$; $b_{06k} = \gamma_{060}$; $b_{07k} = \gamma_{070}$; $b_{10k} = \gamma_{100} + u_{10k}$; $b_{11k} = \gamma_{110}$; $b_{12k} = \gamma_{120}$; $b_{13k} = \gamma_{130}$; $b_{14k} = \gamma_{140}$; $b_{15k} = \gamma_{150}$; $b_{16k} = \gamma_{160}$; $b_{17k} = \gamma_{170}$

Which results in the following expression:

$$Stock\ Price_{tjk} = \gamma_{000} + \gamma_{100} year_{jk} + \gamma_{010} EPS_{jk} + \gamma_{020} BPS_{jk} + \gamma_{030} GOV_{CIA\,jk} + \gamma_{040} EPSG_{jk} + \gamma_{050} BVPG_{jk} + \gamma_{060} ASSETS_{jk} \gamma_{070} REVENUE_{jk} + \gamma_{110} EPS_{jk} year_{jk} + \gamma_{120} BVP_{jk} year_{jk} + \gamma_{130} GOV_{CIA_{jk}} year_{jk} + \gamma_{140} BVPG_{jk} year_{jk} + \gamma_{150} EPSG_{jk} year_{jk} + \gamma_{160} ASSETS_{jk} year_{jk} + \gamma_{170} REVENUE_{jk} year_{jk} + \mu_{00k} + \mu_{10k} year + r_{0jk} + r_{1jk} year + e_{tjk} \quad (4.1)$$

And the linear trend model with random intercepts and slopes at level three is now specified as follows:

$$Stock\ Price_{tjk} = \pi_{0jk} + \pi_{1jk} . ano_{jk} + e_{tjk} \quad (5)$$

$$\pi_{0jk} = b_{00k} + b_{01k} EPS_{jk} + b_{02k} BVP_{jk} + b_{03k} GOV\_CIA_{jk} + b_{04k} BVPG_{jk} + b_{05k} EPSG_{jk} b_{06k} ASSETS_{jk} + b_{07k} REVENUE_{k} + r_{0jk}$$

$$\pi_{1jk} = b_{10k} + b_{11k} EPS_{jk} + b_{12k} BVP_{jk} + b_{13k} GOV\_CIA_{jk} + b_{14k} BVPG_{jk} + b_{15k} EPSG_{jk} b_{16k} ASSETS_{jk} + b_{17k} REVENUE_{k} + r_{1jk}$$

$$b_{00k} = \gamma_{000} + \gamma_{001} VC + \gamma_{002} PS + \gamma_{003} GE + \gamma_{004} RQ + \gamma_{005} CC + \gamma_{006} RL + \gamma_{007} FDI + \gamma_{008} PIB + \gamma_{009} CDS + \mu_{00k}$$

$$b_{01k} = \gamma_{010}; b_{02k} = \gamma_{020}; b_{03k} = \gamma_{030}; b_{04k} = \gamma_{040}; b_{05k} = \gamma_{050}; b_{06k} = \gamma_{060}; b_{07k} = \gamma_{070}$$

$$b_{10k} = \gamma_{100} + \gamma_{101} VC + \gamma_{102} PS + \gamma_{103} GE + \gamma_{104} RQ + \gamma_{105} CC + \gamma_{106} RL + \gamma_{107} FDI + \gamma_{108} PIB + \gamma_{109} CDS + \mu_{10k}$$

$$b_{11k} = \gamma_{110}; b_{12k} = \gamma_{120}; b_{13k} = \gamma_{130}; b_{14k} = \gamma_{140}; b_{15k} = \gamma_{150}; b_{16k} = \gamma_{160}; b_{17k} = \gamma_{170}$$

Which results in the following expression:

$$Stock\ Price_{tjk} = \gamma_{000} + \gamma_{100} year_{jk} + \gamma_{010} EPS_{jk} + \gamma_{020} BVP_{jk} + \gamma_{030} GOV\_CIA_{jk} + \gamma_{040} BVPG_{jk} + \gamma_{050} EPSG_{jk} + \gamma_{060} ASSETS_{jk} + \gamma_{070} REVENUE_{jk} + \gamma_{001} VC_{k} + \gamma_{002} PS_{k} + \gamma_{003} GE_{k} + \gamma_{004} RQ_{k} + \gamma_{005} CC_{k} + \gamma_{006} RL_{k} + \gamma_{007} FDI_{k} + \gamma_{008} PIB_{k} + \gamma_{009} CDS_{k} + \gamma_{110} EPS_{Jk} year_{jk} + \gamma_{120} BPS_{Jk} year_{jk} + \gamma_{130} GOV\_CIA_{Jk} year_{jk} + \gamma_{140} BVPG_{Jk} year_{jk} + \gamma_{150} EPSG_{Jk} year_{jk} + \gamma_{160} ASSETS_{Jk} year_{jk} + \gamma_{170} REVENUE_{Jk} year_{jk} + \gamma_{101} VC_{k} year_{jk} + \gamma_{102} PS_{k} year_{jk} + \gamma_{103} GE_{k} year_{jk} + \gamma_{104} RQ_{k} year_{jk} + \gamma_{105} CC_{k} year_{jk} + \gamma_{105} RL_{k} year_{jk} + \gamma_{107} FDI_{k} year_{jk} + \gamma_{108} PIB_{k} year_{jk} + \gamma_{109} CDS_{k} year_{jk} + \mu_{00k} + \mu_{10k} year + r_{0jk} + r_{1jk} year + e_{tjk} \quad (5.1)$$

Through model 5.1 it is possible to verify whether the variables at the firm level (level 2) and at the country level (level 3) explain the variability of prices between countries. This model is used to test Hypothesis 2 and Hypothesis 3. For Hypothesis 1 the testing procedures will be the same as those used in model 5.1, but the models to be tested are models 6 to 10.

$$Corporate\ Governance\ _{tjk} = \gamma_{000} + u_{00k} + r_{0jk} + e_{tjk} \quad (6)$$

$$Corporate\ Governance\ _{tjk} = \gamma_{000} + \gamma_{100.}ano_{jk} + u_{00k} + r_{0jk} + e_{tjk} \quad (7)$$

$$Corporate\ Governance\ _{tjk} = \gamma_{000} + \gamma_{100.}anojk + u_{00k} + u_{10k.}ano + r_{0jk} + r_{1jk.}ano + e_{tjk} \quad (8)$$

$$Corporate\ Governance_{tjk} = \gamma_{000} + \gamma_{100.}year_{jk} + \gamma_{010.}ASSETS_{jk} + \gamma_{020.}REVENUE_{jk} + \gamma_{110.}ASSETS_{jk}.year_{jk} + \gamma_{120}REVENUE_{jk}year_{jk} + \mu_{00k} + \mu_{10k}year_{jk} + r_{0jk} + r_{1jk}year + e_{tjk} \quad (9)$$

$$Corporate\ Governance\ _{tjk} = \gamma_{000} + \gamma_{100.}ano_{jk} + \gamma_{010.}ASSETS_{jk} + \gamma_{020.}REVENUE_{jk} + \gamma_{001}VC_k + \gamma_{002}PS_k + \gamma_{003}GE_K + \gamma_{004}RQ_k + \gamma_{005}CC_k + \gamma_{006}RL_k + \gamma_{007}FDI_k + \gamma_{009}CDS_k + \gamma_{110}ASSETS_{jk}year_{jk} + \gamma_{120}REVENUE_{jk}year_{jk} + \gamma_{101}VC_{jk}year_{jk} + \gamma_{102}PS_kyear_{jk} + \gamma_{103}GE_kyear_{jk} + \gamma_{104}RQ_kyear_{jk} + \gamma_{105}CC_kyear_{jk} + \gamma_{106}RL_kyear_{jk} + \gamma_{107}FDI_kyear_{jk} + \gamma_{108}PIB_kyear_{jk} + \gamma_{109}CDS_kyear_{jk} + \mu_{00k} + \mu_{10k}year + {}_{r_{0jk}} + r_{1jk}year + e_{tjk} \quad (10)$$

Model 10 aims to verify whether the variables at the country level explain the variability of corporate governance of companies over time. Based on the models that were developed and the hypotheses that were stated, the table presents the operational elements that will serve as a basis for rejecting or not the hypotheses of this research.

Hypothesis	Verification Procedure
H1	Full or partial statistical significance of coefficients γ_{101}; γ_{102} ;γ_{103} ;γ_{104} ;γ_{105} ;γ_{106} of model 10.
H2	i) Statistical significance of coefficients γ_{010} ;γ_{020} ;γ_{030} ;γ_{040} γ_{050} γ_{110} γ_{120} γ_{130} γ_{140} γ_{150} of the model 9.1; ii) Better fit of model 4.1 compared to model 1.
H3	Statistical significance of coefficients γ_{001}; γ_{002}; γ_{003}; γ_{004}; γ_{005}; γ_{006}; γ_{101}; γ_{102}; γ_{103}; γ_{104}; γ_{105}; γ_{106} ii) Better fit of model 5.1 compared to model 1.

Figure 1 – Variables Used in the Study
Source: Prepared by the authors.

4 ANALYSIS AND DISCUSSION OF RESULTS

4.1 Descriptive Statistics

Table 1 presents the descriptive statistics (mean) of the variables at the firm level and at the country level. The country with the highest average share price is found to be Switzerland while the lowest average is Indonesia, similarly for the average Earnings per Share and Book Value per Share. At the corporate governance level, the United States has the highest average while South Africa has the lowest corporate governance.

Table 1
Descriptive Statistics Mean

	P	EPS	BVP	GOV_CIA	ASSETS	REVENUE	VA	OS	GE	RQ	CC	RL	FDI	GDP	CDS
1	5,7	0,3	3,5	46,0	20,2	18,8	94,6	80,8	93,5	97,6	94,5	94,9	10,7	27,7	39,8
2	9,9	0,2	8,9	43,8	22,5	21,6	62,4	39,5	47,8	51,4	50,5	51,4	11,0	28,4	201,1
3	21,3	0,8	13,5	48,3	21,6	20,2	95,3	88,7	95,7	95,7	95,5	95,6	10,6	28,1	6,3
4	3,3	0,3	1,2	44,9	23,0	22,3	5,9	29,6	62,5	45,2	42,8	41,0	11,7	29,8	86,0

5	59,8	2,8	36,1	50,1	23,5	22,9	88,7	58,4	89,0	84,2	89,2	89,4	10,0	28,6	66,2
6	55,4	3,1	32,8	49,7	23,1	22,5	94,3	71,8	93,3	93,9	94,0	92,2	10,2	28,9	32,5
7	3,5	0,4	3,5	44,1	22,8	21,5	63,8	80,3	96,5	99,2	93,0	92,6	11,5	26,4	47,9
8	11,1	0,5	3,0	45,0	22,3	21,6	60,6	13,4	54,3	39,6	41,8	53,9	10,5	28,3	183,2
9	0,8	0,5	0,3	40,4	21,6	21,3	50,8	26,1	49,8	45,5	34,4	37,3	9,5	27,5	164,6
10	23,9	1,1	18,2	49,7	22,8	22,5	80,8	83,4	92,6	85,1	91,1	88,9	7,0	29,3	60,1
11	65,5	4,2	58,2	42,9	23,0	22,5	70,0	56,9	83,2	80,6	70,0	82,4	9,2	27,9	71,8
12	1,9	0,9	0,8	42,7	21,9	21,1	34,8	50,5	79,1	72,1	62,0	67,3	9,0	26,4	108,1
13	17,7	1,7	8,6	46,8	23,3	22,7	20,6	19,3	44,9	37,4	16,0	24,7	10,2	28,2	212,4
14	16,3	1,1	7,0	49,6	23,8	22,7	5,9	30,5	58,2	55,0	59,7	59,3	9,1	27,2	100,3
15	3,8	0,3	2,6	48,4	22,4	21,3	44,0	95,2	99,9	99,2	97,4	94,3	10,9	26,4	45,5
16	7,6	0,5	3,6	41,0	21,1	20,4	68,0	41,4	65,9	63,0	58,4	58,1	8,3	26,6	192,4
17	18,8	0,8	12,4	46,7	22,8	21,9	82,3	48,4	81,8	80,0	76,1	82,6	10,1	27,9	171,1
18	95,7	5,6	51,9	47,5	22,6	21,9	98,6	95,7	98,6	95,7	96,9	96,8	9,0	27,2	2,0
19	1,7	0,1	0,7	42,6	22,3	21,9	27,9	14,0	64,0	59,2	43,2	51,1	8,7	26,7	99,9
20	49,4	2,3	22,1	53,6	22,6	21,9	84,3	63,4	91,1	89,9	88,1	91,1	12,4	30,5	29,1
Tot.	29,7	1,5	16,7	48,5	22,3	21,5	76,2	65,4	85,8	83,0	81,6	83,2	10,4	28,8	62,4

Legend: 1-Australia, 2-Brazil, 3-Canada,4-China,5-France,6-Germany,7-Hong Kong,8-India,9-Indonesia,10-Japan,11-Korea,12-Malaysia,13-Russia, 14-Saudi Arabia ,15-Singapore ,16-South Africa ,17-Spain ,18-Switzerland, 19-Thailand ,20-USA. P- Share price three months after fiscal year, EPS-Earnings Per Share, BVP-Book Value Per Share, GOV_CIA-Corporate Governance, , REVENUE-Logarithm of total revenue, ASSETS-Logarithm of Total Assets, VA-Voice and Accountability, PS-Political Stability, GE-Government Effectiveness, RQ-Regulatory Quality, CC-Control of Corruption, RL-State of Law, GDP-Logarithm of GDP, FDI-Logarithm of Foreign Direct Investment Inflows, CDS-Logarithm of CDS.
Source: Prepared by the authors.

The overall average of the institutional matrix variables is 68.07 and only four countries have all variables above this average, namely Australia, Canada, Germany, Japan, and Switzerland. Thus, Canada, Germany and Japan also have corporate governance above the average of the other countries. On the other hand, Brazil, China, India, Indonesia, Russia, Saudi Arabia and Thailand have institutional matrix indices below the overall average. Of these countries, with the exception of Saudi Arabia, all have corporate governance below the average of the other countries.

A first analysis of the data was performed by means of linear OLS adjustment. The estimations indicated differences in the intercepts and distinct slopes over time for both corporate governance and share price. This represents indications of differences between countries and, if models were estimated that did not consider the grouping of these data, there could be not so correct conclusions of the reality studied (Courgeau, 2003). Characterizing the temporal nesting of firms belonging to different countries in the data with repeated measures, we estimate the null model (non-conditional model) that allows us to verify whether there is variability in stock price and corporate governance between firms from the same country

and between those from different countries. No variables are entered in this model, as it only considers the existence of an intercept and error terms with equal respective variances.

4.3 Models for Estimation Hypothesis H1

Table 3 presents the output for the models that have corporate governance as the dependent variable.

Table 2
Results Models 6, 7 and 8

Model		1		2		3	
a	Intercept	46,37753	***	34,49266	***	33,57384	***
	Year γ_{100}			2,164275	***	2,27217	***
b	Country	9,421076	***	9,478822	***	84,17444	***
	Firm	300,822	***	305,772	***	464,4591	***
	Time	259,3707	***	216,8838	***	152,3416	***
c	Level 3 (Country) τ_{U000}	0,0165		0,0178		0,1201	
	Level 2 (Firms) τ_{r000}	0,5281		0,5746		0,6626	
	Level 1 (Time) σ^2	0,4553		0,4076		0,2173	
d	Likelihood Ratio Test						
	Linear regression - Test Qui2	13417,25	***	15737,14	***	19203,38	***

Legend: a- Fixed Effects Coefficients, b- Random Effects Parameter Estimators (Variance), c- Intraclass Correlation Coefficient, d- Verifiability Test. Explained Variable: GOV_CIA-Corporate Governance. Model 1: Model 12 - Null Model; Model 2: Model 13 - Linear Trend Model with Random Intercepts; Model 3: Model 14 - Linear Trend Model with Random Intercepts and Slopes. *** Sig at 1%.

Source. Prepared by the authors.

The values found for the null model allow us to verify that there is variability in corporate governance between firms from the same country and between those from different countries. Through the intraclass correlation coefficient (which represents the decomposition of variance between the three levels) it is possible to verify that the greatest variability (53%) occurs at the firm level, i.e. between firms from the same country. The 45% corresponds to the variability between the prices of firms from different countries and, no less important, but significant, is the percentage of explanation at the country level of 2%. Model 2 considers the addition of the time variable and, considering the significance of the coefficients, this indicates that there is a linear trend over time, with significant variance of intercepts between firms belonging to the same country and those belonging to different countries. Model 3 considers the presence of slope random effects at levels 2 (firm) and 3 (country). From this model, it can be seen that the random effects between firms and countries make up 78% of the total variance of the residuals. Thus, from the above evidence, we can move on to model 4 and 5, in which level 2 and 3 variables are included.

Table 3
Model 9 and 10 results

Model			**4**			**5**	
	Intercept	-	99,9403	***	-	118,9536	**
	Year γ_{100}		8,4476	***		1.158,4580	***
	Revenue γ_{020}		1,6310	***		1,6684	***
	Revenue A γ_{120}		0,0078			0,0065	
	Assets γ_{010}		4,3849	***		4,3255	***
	Assets A γ_{110}	-	0,2835	***	-	0,2818	***
	VA γ_{001}				-	0,0570	
	PS γ_{002}					0,4905	
	GE γ_{003}					0,2996	
	RQ γ_{004}				-	0,4868	
	CC γ_{005}					0,8408	
	RL γ_{006}				-	0,4116	
	VAA γ_{101}					1,1049	***
a	PSA γ_{102}				-	0,4385	***
	GEA γ_{103}				-	0,6541	***
	RQA γ_{104}					0,3156	***
	CCA γ_{105}					2,5236	***
	RLA γ_{106}				-	2,1367	***
	GDP γ_{008}				-	0,2287	
	GDPa γ_{108}				-	48,0683	***
	FDI γ_{007}					0,9966	
	FDIa γ_{107}					14,7164	
	CDS γ_{009}					0,1309	
	CDSa γ_{109}					0,6218	***
	Country		69,66419	***		49,88114	**
b	Firm		382,2778	***		387,6885	***
	Time		152,9089	***		148,9297	***
	Level 3 (Country) τ_{U000}		0,1152			0,0850	
c	Level 2 (Firms) τ_{r000}		0,6320			0,6610	
	Level 1 (Time) σ^2		0,2528			0,2539	
d	Likelihood Ratio Test						
	Linear regression - Test Qui2		17344,33	***		16832,81	***

Legend: a- Fixed effects coefficients, b- Estimators (Variance) of Random Effects Parameters, c- Intraclass Correlation Coefficient (Country: Proportion of variance attributed to variation between countries, Firm: Proportion of variance between firms within the same country, Time: Variation between firm observations within time), d- Verifiability Test. Explanatory variables: REVENUE-Logarithm of total revenue, ASSETS-Logarithm of total assets. Explained Variable: GOV_CIA-Corporate Governance. Model 4: Model 15 - Linear Trend Model with Random Intercepts and Slopes and Level 2 Variables, Model 5: Model 16 - Linear Trend Model with Random Intercepts and Slopes and Level 2 and Level 3 Variables. ***Sig at 1%, ** Sig at 5%.

Source: Prepared by the authors.

From the models in Table 4, it can be seen that is statistically significant, due to the likelihood ratio test and the variances of the error terms being larger than the standard errors. Additionally, it is possible to verify the significance of the institutional level coefficients. This evidences that corporate governance is not something static over time, but rather a dynamic process in which its practices are revised and improved throughout the changes in reality from institutional changes. (North, 1990; Aguilhera & Cuervo-Cazurra, 2004).

4.3 Models for Hypothesis Estimation H2 e H3

Initially, the null model was estimated in order to start the multilevel model verification tests. Based on the variables previously defined and the methodology described the outputs for the null model are presented in the table below. 5.

Table 4
Model results 1.1, 2.1 e 3.1

Model		1		2		3	
a	Intercepto γ_{000}	23,9066	***	11,8989	**	17,2625	***
	Level γ_{100}			2,1871	***	1,2640	***
b	Country	721,50	***	722,79	***	330,23	***
	Firm	810,39	***	818,23	***	747,34	***
	Teme	386,00	***	342,53	***	129,29	***
c	Level 3 (Country) τ_{U000}	0,3762		0,3837		0,2736	
	Level 2 (Firm) τ_{r000}	0,4225		0,4344		0,6192	
	Level 1 (Time) σ^2	0,2013		0,1819		0,1071	
d	Likelihood Ratio Test x Linear regression - Test Qui2	28951,62	***	31085,66	***	46738,35	***

Legend: a- Fixed Effects Coefficients, b- Random Effects Parameter Estimators (Variance), c- Intraclass Correlation Coefficient, d- Verifiability Test. Explained Variable: Share Price three months after the fiscal year. Model 1: Model 6.1 - Null Model; Model 2: Model 7.1 Linear Trend Model with Random Intercepts, Model 3: Model 8.1 - Linear Trend Model with Random Intercepts and Slopes. .***Sig at 1%, ** Sig at 5%.
Source: Prepared by the authors.

From the null model 1, it can be seen that the highest variability occurs between the stock prices of firms from the same country (firm level) is 42% while for firms from different countries the correlation is 38%. This means that prices are more correlated between firms belonging to the same economic and institutional structure than with other structures. Model 2 shows that the variability in stock prices of firms from the same country is higher than that of firms from different countries. Additionally, there is a linear relationship over time. In model 3, according to Fávero and Belfiore (2017) in this model, the year variable is present in the fixed effects component and in the random effects components of level 3 (multiplying the error term u10k) and level 2 (multiplying the error term r1jk). Thus, for model 3 the random effects of firms and countries make up 89% of the total variance of the residuals. Based on these analyses and results, the multilevel regression model is adequate, and we can move on to the other levels to see if these variations over the years can be explained with the characteristics of level 2 (Firm) and level 3 (Country). The outputs are shown in Table 5.

Table 5
Results models 4.1 and 5.1

Model		4			5	
Intercept γ_{000}		28,3371	***		51,0742	
Year γ_{100}		1,7720	***		4,4056	
EPSγ_{010}	-	6,7362	***	-	6,7805	***
BVPaγ_{110}		1,2273	***		1,2225	***
BVPaγ_{020}		1,4671	***		1,4592	***
BVPaγ_{120}	-	0,0150	***	-	0,0148	***

	GOV_CIAγ_{030}		0,1496	***		0,1483	***
	GOV_CIAaγ_{130}	-	0,0078	**	-	0,0082	***
	EPSGγ_{050}		0,9337	***		0,9375	***
	BVPGγ_{040}	-	0,0106	***	-	0,0105	***
	Revenueγ_{070}		0,9868	***		0,9888	***
	Revenueaγ_{170}		0,1709	***		0,1704	***
	Assetsγ_{060}	-	2,2931	***	-	2,2782	***
	Assetsaγ_{160}	-	0,2263	***	-	0,2232	***
A	VCγ_{001}					0,9093	
	PSγ_{002}					0,1504	
	GEγ_{003}				-	0,3908	
	RQγ_{004}				-	0,0031	
	CCγ_{005}				-	0,8993	
	RLγ_{006}					0,1027	
	VCaγ_{101}					0,0012	
	PSaγ_{102}					0,2420	***
	GEaγ_{103}				-	0,5681	***
	RQaγ_{104}					0,2592	***
	CCaγ_{105}					0,0058	
	RLaγ_{106}				-	0,0762	
	GDPγ_{008}				-	0,1989	
	GDPaγ_{108}					0,6235	
	FDIγ_{007}					0,1131	
	FDIaγ_{107}				-	0,2276	
	CDSγ_{009}				-	0,0266	
	CDSaγ_{109}				-	0,0139	***
	Country		21,59	***		41,52	**
b	Firm		379,23	***		379,67	***
	time		129,44	***		128,99	***
	Level 3 (Coutry) τ_{U000}		0,0407			0,0755	
c	Level 2 (Firms) τ_{r000}		0,7152			0,6901	
	Level 1 (Time) σ^2		0,2441			0,2344	
d	Likelihood Ratio Test x Linear regression - Test Qui2		24138,62	***		22208,01	***

Legend: a- Fixed Effects Coefficients, b- Random Effects Parameter Estimators (Variance), c- Intraclass Correlation Coefficient (Country: Proportion of variance attributed to variation across countries, Firm: Proportion of variance across firms within the same country, Time: Variation across firm observations within time), d- Verifiability Test. Explanatory variables: EPS-Earnings Per Share, EPS-Equity Value Per Share, GOV_CIA-Corporate Governance, EPS-Earnings Per Share Interacting with Corporate Governance, EPS-Equity Value Interacting with Corporate Governance, REVENUE-Logarithm of Total Revenue, ASSETS-Logarithm of Total Assets, VC-Voice and Accountability, OS-Political Stability, GE-Government Effectiveness, RQ-Regulatory Quality, CC-Control of Corruption, RL-State of Law, GDP-Logarithm of GDP, FDI-Logarithm of Foreign Direct Investment Inflows, CDS-Logarithm of CDS. Explained Variable: Share Price three months after the fiscal year. Model 4: Model 9.1 - Linear Trend Model with Random Intercepts and Slopes and Level 2 Variables, Model 5: Model 10.1 - Linear Trend Model with Random Intercepts and Slopes and Level 2 and Level 3 Variables. .***Sig at 1%, ** Sig at 5%.
Source: Prepared by the authors.

Table 5 presents the results of the regressions of models 4.1 and 5.1. These models aim to explain the variation in stock prices at the firm level from firm-level and country-level characteristics. These models are the level 2 specifications of multilevel modeling. At this level, the modeling will be used to verify whether firm-level and country-level variables explain price variability.

The EPS and EPS variables representing the main accounting variables are significant in explaining stock price changes, which confirms the relevance of accounting information as being able to explain stock prices. In addition, it can be verified that for the coefficient of EPS it presents a positive slope, which means

that as variations in EPS occur, these variations present positive changes in stock prices. As for corporate governance at the firm level, it presents statistically significant coefficients. This means that the governance characteristics of firms explain the variability of stock prices. Additionally, this variable when interacting with accounting information is also significant. In this sense, when observing the accounting information, corporate governance, and size variables, they are significant in explaining the variability of stock prices of firms belonging to the same country. It can be seen that the variables at the firm level remain with their respective statistical significance. At the country level, the variables that have statistical significance are political stability, government efficiency, regulatory quality, and risk. This means that the institutional context is relevant for asset pricing, reducing information asymmetry and ensuring more confidence for the markets. Additionally, we sought to analyze the impact of the inclusion of variables on the relevance of information, through the intraclass correlation coefficient, as found in Santos (2013).

Table 6

Comparative result of variance decomposition (Intraclass Correlation Coefficient)

Comparison	
Null Model (Model 1)	
Level 3 (Country)	0,3761942
Level 2 (Firms)	0,4225417
Level 1 (Time)	0,2012640
Model with inclusion of Firm variables (model 2)	
Level 3 (Country)	0,0407103
Level 2 (Firms)	0,7151864
Level 1 (Time)	0,2441033
Model with inclusion of Firm and Country variables (model 3)	
Level 3 (Country)	0,0754672
Level 2 (Firms)	0,6900835
Level 1 (Time)	0,2344493
Comparative analysis of total variances (Test Pseudo R^2)	
Model 3 x Null Model	0,71
Model 2 x Null Model	0,72

Legend: Calculation of total variance comparative models: 1-(total variance of the model with variables/total variance of the null model) similar to Santos (2013).

Source: Prepared by the authors.

Table 6 presents the proportions of variance. When shown for the Country, it represents the proportion of variance attributed to variation between countries and when shown for the Firm, it represents the proportion of variance between firms within countries. Thus, it is possible to verify that the inclusion of institutional variables improves the explanatory capacity of the model. This corroborates the idea of this research that the elements of the institutional matrices increase the relevance of accounting information. These are political stability, government efficiency, regulatory quality and risk.

5 DISCUSSIONS OF THE RESULTS

In this topic, the main results found in the research were selected for discussion:

i) Institutional matrices are relevant to explain the variability of corporate governance over time: The initial tests of model adequacy showed that there is indeed variability in corporate governance among firms in different countries and also among firms in the same country. The results indicate that the variables at the firm level and at the institutional level are relevant to explain the variability of corporate governance over time. This variability is the result of corporate dynamics that change over time. In other words, corporate governance is not static, but a dynamic process in which its practices are revised and improved as new realities emerge. (Aguilhera & Cuervo-Cazurra, 2004).

The practices that are adopted in countries must be in line with legal norms and socio-economic objectives and, as changes occur in the environment, organizational norms follow these changes (Khadaroo & Shaikh, 2007). It is a process of interaction between institutional matrices and organizations (North, 1993). This relationship is in line with the studies of Khadaroo and Shaikh (2007), Li and Harrison (2008) Zattoni and Cuomo (2008) Daniel, Cieslewicz and Pourjalali (2012) and Humphries and Whelan (2017) who point out that variations in corporate governance at the firm level are explained by variations in intentional matrices, because of the existence of interaction between institutions and organizational practices. The variables Voice and Accountability, Regulatory Quality and Corruption Control presented statistically significant coefficients and with coefficients in line with what was expected. That is, countries with higher regulatory quality, greater participation of the population in the selection of government and control of corruption, companies have higher levels of corporate governance. Regarding the participation of the population in the selection of the government, freedom of expression and media, this variable presented a positive relationship with corporate governance. This relationship is in line with the study by Daniel, Cieslewicz and Pourjalali (2012). According to these authors, this relationship occurs because countries with higher population participation have a higher economic culture and this economic culture is related to better corporate governance in companies. As for the variable of corruption control, the results are in line with the study by Daniel, Cieslewicz and Pourjalali (2012). According to the authors, this positive relationship means that in institutional environments in which corruption tends not to be tolerated, the pressure on corporate governance practices to promote accountability and transparency increases. Regarding the regulatory quality variable, this variable represents the perception of the government's ability to implement policies and regulations to promote development. That is, to the extent that the government is given legitimacy to implement regulations, organizations become a channel to execute such policies. (Khadaroo & Shaikh, 2007; Daniel, Cieslewicz & Pourjalali, 2012).

In line with what the data show, and with the results of the regressions, it is not possible to reject H1. This means that the elements of the institutional matrices explain the variability in corporate governance over time. Thus, to the extent that countries have higher levels of institutions in terms of contractual guarantees and contract compliance, firms have better governance structures. This relationship is

understood as incentives that companies receive from the context to optimize internal management, ensure better efficiency, quality, and transparency. In other words, internal and external mechanisms to ensure that decisions are made in the best interest of stakeholders. (Silvera, 2006; Carvalho, 2007).

ii) Some countries have elements of weaker institutional matrices with good structures in the corporate governance of the firm: Three variables were statistically significant, but with a sign different from the expected sign. The variables are political stability, government efficiency and rule of law. Other studies that used these variables as explanatory variables found different coefficients depending on the countries being analyzed (Isukul & Chizea, 2016; Modugu & Dempere, 2020). This is because countries have different institutional elements, and the period of analysis also influences the results. According to Kauffman (2017) when studying country-level characteristics, they do not change in a short period of time, so the author indicates studying a 10-year window. This is a time when it is possible to verify institutional changes. Thus, when finding a significant relationship with negative coefficients, they indicate countries with particularities that may be influenced in the aggregate analysis. Such countries have their particularities, as Vora-Sittha (2012) points out, Thailand even with low institutional levels has a history of economic growth. In addition, other institutional elements may be related to the countries surveyed. However, it was not the focus of this paper to verify what these items are, but rather to verify whether there are institutional elements that explain the variability of corporate governance over the years. However, in countries with greater legal insecurity and political instability, companies also present quality in their governance structure. This represents evidence that organizations generate value even with weaker institutional structures.

iii) corporate governance at the firm level increases the relevance of accounting information: Based on the results found, it can be verified that corporate governance increases the relevance of accounting information, in line with Fiador (2013) who points out that one of the most important functions of CG is to ensure the quality of accounting information. That is, users of accounting information recognize greater value to the accounting numbers disclosed by companies with better corporate governance structures, so that their disclosure reduces information asymmetry and favors analysts' forecasts (Berthelot & Morris, 2008; Dalmácio, Lopes, Rezende & Neto, 2013). This greater evaluation by information users, for Habib and Azim (2008), is verified to the extent that corporate governance helps to restrict opportunistic earnings management practices. In addition, corporate governance structures lead to better decisions and management control, ensuring greater value to investors and better market confidence (Silveira, 2010). Moreover, these results are in line with the studies by Jamaluddin, Mastuki and Ahmad (2009), Lopes (2009), Fiador (2013), Malik and Shah (2013) and Balagobei (2018).

iv) Over time, there has been a decline in the relevance of Net Income per Share: The results of the information relevance model, the Earnings Per Share variable presented significant coefficients with a negative sign. In a recent study, Barth, Li and McLure (2019) studied the evolution of the relevance of accounting information from 1962 to 2014. In the study, one of the findings points to a decrease in the relevance of net income. This does not mean that this variable has lost its significance, but that over the years, other accounting variables have been used

as a source for decision making. So that Earnings Per Share decreases the relevance. This relationship was also found by Peixoto (2018) when studying the relevance of analysts' forecasts in emerging countries. This relationship was found in the present study, which indicates that even if earnings per share is one of the most important accounting variables (Lopes, 2009) it disputes informational capacity with other variables. In addition, depending on the sector in which the company operates, other variables may be more relevant. (Barth, Li & McLure, 2019).

v) Institutional matrices are relevant to explain stock price variability: The results found support the hypothesis that the institutional environment influences the relevance of accounting information. This influence occurs through corporate governance. That is, there is an interaction between institutions and organizational structures (North, 1990; Menard & Shirley, 2005) that is the channel through which the relevance of information is achieved and economic value is generated (Reddy & Sharma, 2012). The results are in line with Peixoto (2018) when evidencing that the characteristics of the environment in which the company is inserted are perceived by market agents, so that they can contribute or decrease uncertainty in the process of forming their forecasts. Results also corroborate Batistella, Dal Magro, Mazzioni and Paulo (2021) when verifying that cultural elements influence the relevance of accounting information. To the extent that companies have better institutional levels, with greater guarantee of property rights and compliance with contracts, there are lower transaction costs, and in line with Silveira (2004) these structures shape the corporate governance models adopted by companies. That is, as institutional matrices differ in economies, governance practices are differentiated and these practices are evaluated by the market, which ends up being reflected in stock prices. In other words, it can be said that when the market is pricing a certain asset, it is, at the same time, pricing the institutions that surround that company.

6 CONCLUSIONS, LIMITATIONS AND FUTURE STUDIES

This study aimed to verify the relevance of institutional matrices and accounting information in the 20 economies with the highest market capitalization in 2018. To this end, we verified i) the relationship between institutional matrices and corporate governance, ii) measure the relationship between corporate governance and the relevance of accounting information and iii) identify the relationship between institutional matrices and relevance of accounting information. For this, we used a multilevel regression model with repeated measures. Different models were estimated to support the hypotheses of the study. The sample consisted of 2542 companies listed in the 20 countries with the largest market capitalization. The period of analysis ranged from 2010 to 2018, which resulted in 20,002 observations.

Through the results of the model for H1, it was verified that institutional matrices influence the corporate governance of companies. By verifying that the variables at the institutional level are significant to explain corporate governance. This means that corporate practices are aligned with the institutions of the different economies, i.e. that the rules and sets of rules of the countries exert influence on

governance structures. To the extent that societies show variability in regulatory structures, participation of the population in the selection of their representatives, control of corruption, corporate governance follows these changes by capturing these institutional effects and distributing them in the form of value to stakeholders.

Regarding the relationship between corporate governance and the relevance of accounting information, it proved to be significant. This corroborates one of the objectives of corporate governance, which is to provide relevant information for the decision-making of external users, which confirms H2. In addition, it is possible to infer that the presence of good governance structures reduces the opportunism of managers, reduces management practices and reduces information asymmetries. Thus, the information is more reliable and closer to the company's economic reality, ensuring better forecasts by analysts. Regarding the relationship between the institutional matrices and the relevance of accounting information, the comparison of the model with the institutional variables presents better estimates and significant estimates. Thus, it was not possible to reject H3. Therefore, it can be concluded that the institutional environment increases the relevance of accounting information. To the extent that accounting information reduces uncertainty, it transmits signals to the market so that this transmission becomes stronger in countries with better institutional levels.

Finally, these results should not be generalized, as the findings are limited to countries with higher market capitalization and to firms that had the governance variable available at the time of data collection. As a suggestion for future research, it is suggested to add other variables at the institutional and macroeconomic level. It is also suggested to study countries other than those with large market capitalization.

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