# CORPORATE GOVERNANCE INDEX AND ITS RELATIONSHIP TO MARKET VALUE

# ÍNDICE DE GOVERNANÇA CORPORATIVA E SUA RELAÇÃO COM O VALOR DE MERCADO

# ÍNDICE DE GOBIERNO CORPORATIVO Y SU RELACIÓN CON EL VALOR DE MERCADO

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**ABSTRACT**

**Study objective:** To build a corporate governance index with Ibovespa companies from 2010 to 2017. It was also sought to analyze the relationship between the constructed index and financial performance.

**Methodology/approach:** the index was built using the principal components method through the dimensions: composition of the board of directors, ownership and control structure, compensation to managers, protection of minority shareholders, transparency, and quality of the independent audit. The relationship between corporate governance index and the market value of companies was analyzed through Granger causality.

**Originality/Relevance:** It is about the creation of a relevant index, since companies are increasingly complex and technological, in addition to the users of accounting information being more demanding and the growing use of essence over form, the which requires even more of the auditor's competence and the adoption of more efficient management practices.

**Main results:** audit quality is the most relevant dimension for best corporate governance practices, with 30.87%, followed by protection of minority shareholders, with 20.33%; compensation to managers, 16.65%; ownership and control structure, 13.99%; composition of the board of directors, 10.15% and, finally, transparency, 8.01%. Corporate governance has an effect on financial performance.

**Theoretical/methodological contributions:** the article contributes, in particular, to the perception of audit quality as an important aspect among good corporate governance practices and through the construction of an index that relates best practices to Market value.

**Key words:** Corporate Governance Index; Audit Quality; Market value; Main Components Method

**RESUMO**

**Objetivo do estudo:** Construir um índice de governança corporativa com as companhias do Ibovespa de 2010 a 2017. Buscou-se, também, analisar a relação entre o índice construído e o desempenho financeiro.

**Metodologia/abordagem:** o índice foi construído através do método de componentes principais por meio das dimensões: composição do conselho de administração, estrutura de propriedade e controle, compensação aos gestores, proteção dos acionistas minoritários, transparência e qualidade da auditoria independente. Foi analisada a relação entre índice de governança corporativa e o valor de mercado das companhias através da causalidade de Granger.

**Originalidade/Relevância:** Criação de um índice relevante, uma vez que as companhias estão cada vez mais complexas e tecnológicas, além de os usuários da informação contábil estarem mais exigentes e da crescente utilização da essência sobre a forma, o que exige ainda mais da competência do auditor e da adoção de práticas de gestão mais eficientes.

**Principais resultados:** a qualidade da auditoria é a dimensão com mais relevância para as melhores práticas de governança corporativa, com 30,87%, seguida por proteção aos acionistas minoritários, com 20,33%; compensação aos gestores, 16,65%; estrutura de propriedade e controle, 13,99%; composição do conselho de administração, 10,15% e, por último, transparência, 8,01%. A governança corporativa tem efeito sobre o desempenho financeiro.

**Contribuições teóricas/metodológicas:** o artigo contribui com a percepção da qualidade da auditoria como um importante aspecto dentre as boas práticas de governança corporative e por meio **da** construção de um índice que relaciona as melhores práticas com o valor de Mercado**.**

**Palavras-chave:** Índice de Governança Corporativa, Qualidade da Auditoria, Valor de Mercado, Método de Componentes Principais

## RESUMEN

**Objetivo del estudio:** Elaborar un índice de gobierno corporativo con empresas de Ibovespa de 2010 a 2017. También se buscó analizar la relación entre el índice construido y el desempeño financiero.

**Metodología / enfoque:** el índice se construyó utilizando el método de componentes principales a través de las dimensiones: composición del directorio, estructura de propiedad y control, compensación a los administradores, protección de los accionistas minoritarios, transparencia y calidad de la auditoría independiente. La relación entre el índice de gobierno corporativo y el valor de mercado de las empresas se analizó a través de la causalidad de Granger.

**Originalidad / Relevancia:** Se trata de la creación de un índice relevante, ya que las empresas son cada vez más complejas y tecnológicas, además de que los usuarios de la información contable son más exigentes y el uso creciente de la esencia sobre la forma, lo que requiere aún más de la competencia del auditor y la adopción de prácticas de gestión más eficientes.

**Principales resultados:** la calidad de la auditoría es la dimensión más relevante para las mejores prácticas de gobierno corporativo, con un 30,87%, seguida de la protección de los accionistas minoritarios, con un 20,33%; compensación a los gerentes, 16,65%; estructura de propiedad y control, 13,99%; composición del consejo de administración, 10,15% y, finalmente, transparencia, 8,01%. El gobierno corporativo tiene un efecto sobre el desempeño financiero.

**Aportes teórico-metodológicos:** el artículo contribuye, en particular, a la percepción de la calidad de la auditoría como un aspecto importante entre las buenas prácticas de gobierno corporativo y mediante la construcción de un índice que relacione las mejores prácticas con el valor de mercado.

**Palabras clave:** índice de gobierno corporativo, calidad de la auditoría, valor de mercado, método de componentes principales

# 1 INTRODUCTION

The delegation of power and the occurrence of informational asymmetry are intrinsic to the separation of ownership and control and are, therefore, points to be worked on by corporate governance (Sabbatini, 2010). The maximization shareholders' value through managerial decisions does not often occur (Ladeira, 2009) because managers work towards their own interests. As a way of minimizing this conflict, there is the alternative of compensating the manager, in part, with shares (Weston, 1969). According to Silva, Bonfim, Gonçalves, and Ninyama (2018), good corporate governance practices can be measured through a series of dimensions, such as board composition, ownership, and control structure, and manager compensation. In addition to these categories, this paper analyzes minority shareholder protection, transparency, and independent audit quality.

Thus, the objective of this work was to build a corporate governance index - IGC 2019 of Ibovespa companies between 2010 and 2017 and to analyze the relationship between this index and the companies' market value. Few studies in Brazil consider audit quality as a dimension of good corporate governance practices and relate them with financial performance. The analysis of the company's performance should be able to project the future and, based on this, observe whether the intrinsic value of the company is reflected in the current value of the shares (Dechow & Schrand, 2004).

When good corporate governance practices are perceived to minimize agency conflicts between the interests of corporate directors and shareholders, such mechanisms become the target of organizations (Vieira, Velasquez, Losekam & Ceretta, 2011). Some of the best corporate governance practices are based on evidence about the work quality performed by agents, provided by accounting information, to reduce the conflicts between agent and principal (Bushman & Smith, 2001; Sloan, 2001).

Hung and Cheng (2018) emphasize the importance of auditors being more careful with auditing, especially in cases where companies conduct many complex transactions, as these are the most common causes of informational asymmetry, audit failures, and auditor liability. Trades in which the agent has privileged information relative to the principal happen with informational asymmetry (Myers & Majluf, 1984).

The auditors' performance is a way to improve the credibility and the quality of accounting information, thus reducing the informational asymmetry (Watts & Zimmerman,

1983). The disclosure of useful information favors the quality of the investment decision by the stakeholders (Brigham, Gapenski & Ehrhardt, 2001). Companies that pay attention to issues related to ethics and conduct are those that generate more profits for shareholders (Srour, 2008).

## 2 THEORETICAL FRAMEWORK
### 2.1 Agency Costs, Informational Asymmetry, and Signaling

For Matos (2001), agency costs can be described as the result of the company's ideal value (in the absence of conflicts of interest) minus its real value (measured through negotiation between the parties). Thus, the author demonstrates that, in order to find an optimal capital structure, the company must seek to minimize the agency costs among the shareholders and managers. In addition to the costs incurred in preparing the company for the change in ownership structure, it is necessary to add monitoring and control costs. In their quest to maximize their utility, managers do not always act according to the owners' interests and, as a consequence, there may be a reduction in the quality of the accounting information (Schipper, 1989).

Financial statements can be manipulated in a way that masks the company's actual financial performance to impair understanding and influence contracts (Healy & Wahlen, 1998). Bushman and Smith (2001) found evidence that information transparency positively influences corporate governance by reducing potential agency problems between shareholders and managers.

According to Okimura (2003), the corporate governance process consists of a series of structures, regulations, and legal agreements between the principal and the agent. It is embodied through a contract between the two parties, in which the goal is to align interests and generate wealth. Along these lines, for Love (2011), poorly implemented corporate governance generates an increase in agency costs.

According to Myers and Majluf (1984), informational asymmetry occurs when one of the parties involved in transactions (the managers) has some relevant private information, without investors being able to access it. Khalil et al. (2019) found evidence that informational asymmetry impacts capital markets and that the timeliness of financial information plays a prominent role in this influence.

In his seminal work analyzing the American used car market, Akerlof (1970) formulated the precept that, in transactions marked by informational asymmetry, the party holding the best information will use this imbalance to its advantage. Thus, the market will be left with an excess of contracts characterized as poor quality and unbalanced.

According to Malacrida and Yamamoto (2006), accounting disclosure is a fundamental tool to mitigate the informational asymmetry present in the capital market and is one of the basic causes of the differences between capital costs and the company's value. Hung and Cheng (2018) link the high risk of auditing to informational asymmetry issues, indicating that increasing information complexity increases informational asymmetry and decreases transparency. Spence (1973), working on labor markets, evaluated ways job applicants could reduce informational asymmetry that impaired their ability to be selected by potential employers. This study sparked several others in the literature, applying signaling theory to selection scenarios occurring across subjects from anthropology to zoology (Bird & Smith, 2005).

In finance, authors have developed several examples to demonstrate how signaling happens. They have postulated, for example, that company debt (Ross, 1973) and dividends (Bhattacharya, 1979) signal the company's quality. According to these models, only high-quality companies would be able to pay interest and dividends in the long run. In contrast, low-quality companies would not be able to sustain such payments (Connelly, Certo, Ireland & Reutzel, 2011).

Marques and Conde (2000) argue that information reaches the agents involved asymmetrically - endowed with imperfections - therefore, it is up to managers to convey to shareholders the company's real situation using signals. Signaling theory assumes that companies with better performance can increase the amount of information disclosed to encourage the market with signals that favor their value position (Ross, 1973; Dye, 1985).

## 2.2    Corporate Governance

The interests of the users of accounting information, as well as the effective achievement of the business objective, are perceived through a set of practices and behavior called corporate governance (Benites & Polo, 2013). After the accounting frauds of large companies, such as Enron and WorldCom, and the perception of ethical deviations, which occurred in the early twenty-first century, attention turned to companies with transparent and

reliable information. Companies strive to reduce conflicts between agents, shareholder expropriation, and increase auditor independence so that the interests of investors are protected.

The main corporate strategy to cope with the substantial increase in the volume of economic transactions and high standards of corporate governance has been the adoption of computerized systems, which streamline business processes and contribute to improving the internal control of companies (Lang & Lundholm, 2000; Sloan, 2001; Leuz, Nanda & Wysocki, 2002; Almeida & Almeida, 2009; Silva et al., 2018 and Vaz, 2018).

Brown and Caylor (2006) found an increase in the firm's market value when the board of directors is not chaired by the company's chief executive. According to Coombes and Wong (2004), function distinction is desirable to keep independence. The installation of an independent audit committee (Baxter & Cotter, 2009; Ahmed & Henry, 2012) and the size of the board of directors are related to increasing the quality of accounting information reported to stakeholders. The external audit and the supervisory and management boards act as mediators between the interests of owners and managers (Ladeira, 2009). The board of directors' independence may be reduced if the ownership of the company is concentrated. This happens because the appointment of board members is mainly made by the majority shareholder (Tinoco, Escuder & Yoshitake, 2011). This fact may accentuate existing conflicts between minority and controlling shareholders and misrepresent the purpose of the board of directors, which is to serve the interests of all shareholders (Minadeo, 2019). The latter author points out that this situation can be alleviated through the establishment of a fiscal council.

Jensen and Meckling (1976) define ownership structure as a relationship between the number of resources allocated by managers and investors. Ownership structure and control vary widely between countries, directly affecting the level of corporate governance. Evaluating the Brazilian scenario with high shareholder concentration, Silveira (2015) found that the main governance conflicts arose from the overlap of majority shareholders on minority shareholders. A study by Leal et al. (2002) found that in Brazil, even when there is no controlling shareholder, companies often end up being controlled by the three largest shareholders, leading to a tightening of control and possible governance conflicts between the parties. This reflects the reduced legal protection for investors and the high concentration of ownership and control (Bernhoeft & Gallo, 2003).

In Hall and Liebman's studies (1998), it was demonstrated that managers' performance is positively linked to their compensation, especially with the increase of share value. For Wong (2009), financial incentives are vital for managers to always act in the company's best interest since external investors have no means of monitoring all the company's internal processes. For Krauter (2013), there is evidence that the financial result of Brazilian firms is directly influenced by the managers' compensation policy. To determine the managers' compensation, it is interesting that shareholders develop performance indicators that work as a proxy variable to measure agents' effort (Matos, 2001).

The protection of minority shareholders is a fundamental corporate governance measure for market equilibrium since this is a legal protection that aims to guarantee the participation rights of minority shareholders in companies. According to La Porta et al. (1998), these rights are exercised to a greater or lesser extent, depending on the legal environment of the country in which the companies operate. In Brazil, Law no. 10,303/2001 and, more recently, Law no. 13,303/2016, aim to allow greater access of small investors to the securities market through trading with publicly traded corporations and/or mixed-economy companies. These laws are intended to provide greater support and security for investors, establishing rules to be followed by all and protecting the interests of those who own a smaller share of the companies.

As a way of reducing asymmetry and increasing transparency, it is suggested that companies publish additional information with good corporate governance practices. Examples are the code of conduct, also known as the code of ethics, and the stock trading policy. "The creation and enforcement of a code of conduct raise the level of internal and external confidence in the organization and, as a result, the value of two of its most important assets: its reputation and image" (IBGC, 2015, p. 93). Members of the boards of publicly-traded companies have been worrying about ethical issues, due to the reputation of companies (Securato, 2003). Among the practices that should be adopted by companies, as indicated in their code of conduct, are "fostering transparency, disciplining the organization's internal and external relations, managing conflicts of interest, protecting physical and intellectual assets, and consolidating good corporate governance practices" (IBGC, 2015, p. 94).

The inclination to hire a "Big Four" audit firm is higher when significant conflicts and agency costs are observed (Fan & Wong, 2005). The auditor's function is to restrict the asymmetry of information between the parties (Dang, 2004) and thus represent an increase in

the quality of the financial statements (Becker et al., 1998). The time elapsed between the disclosure of the financial statements and the disclosure of the audit report is called audit delay in the international literature and is considered an indicator for the audit quality (Ashton et al. 1987; Johnson, 1998; Imam I 2001; Afify, 2009; Braunbeck, 2010). When the auditor detects a higher risk, arising from a weak internal control, the fees will be higher (Hogan & Wilkins, 2008; Chung & Wynn, 2014). Thus, good corporate governance practices can strengthen internal control and, consequently, decrease the fees paid (Bedard & Johnstone, 2004; Munsif et al., 2011).

Since profit is the investor's main interest, one notices an increase in the quality of accounting information from the audit committee's performance because the members are selected by the majority and minority shareholders. Conditional conservatism is related to high-quality accounting information (Baioco & Almeida, 2017). The market comprehends the creation of an audit committee as positive signaling (Wild,1996). External auditors are responsible for verifying whether the financial statements are properly presented according to the regulatory legislation and whether they represent the actual operating results of the entity. It is up to auditors to prevent actions that may be qualified as manipulating the financial reality of the company (Dantas & Medeiros, 2015).

## 3    METHODOLOGY

### 3.1    Sample and data collection

The sample was composed of 26 companies with stock in the Ibovespa theoretical asset portfolio from 2010 to 2017. These were: *Ambev, Bradespar, Braskem, BRF, Cia. Concessões Rodoviárias, Cia. Energética de Minas Gerais, Cia. Paranaense de Energia, Cia. Saneamento Básico SP, Cia. Siderúrgica Nacional, Cosan S.A Indústria e Comércio, CPFL Energia S.A., Cyrela Brazil, Embraer, Fibria, Gerdau, JBS, Lojas Americanas, Lojas Renner, Metalúrgica Gerdau, MRV, Natura, Petrobras, RUMO S.A, Ultrapar, Usiminas*, and *Vale*. A total of 4,160 observations were analyzed. The data was obtained from the website of the Securities and Exchange Commission of Brazil (CVM) and from the Quantum Platform®.

## 3.2    IGC 2019

The index was estimated by principal component analysis. The principal component analysis (PCA) is a multivariate statistical technique that aims to explain the variance and covariance structure of a set of variables through the construction of their linear combinations (Mingoti, 2007). According to Alexander (2009), the principal components analysis can be applied to any set of stationary series, with high or low correlation among themselves. However, the technique is best employed in highly correlated systems. The principal components can be estimated either by the covariance matrix of the original variables or by the correlation matrix. When estimated by the covariance matrix, data volatility influences the estimates, and if estimated by the correlation matrix, the correlations among the variables influence them (Alexander, 2009). Thus, the principal component analysis estimated through the covariance matrix may be of little use when there is a lot of discrepancy among the variables in the model (Mingoti, 2007). In this case, using the correlation matrix standardizes the variables to minimize the effects of very distinct variability, which is the case of the analysis performed in this article.

According to Alexander (2009), PCA can be used to solve missing data and collinear explanatory variables problems. Thus, it is possible to condense information into fewer variables (principal components) that do not correlate with each other and have minimal loss of information. The determination of principal components starts from the decomposition of the sample correlation matrix R_(p×p) and can be expressed by:

$$Y_j = e_j'Z = e_{j1}Z_1 + e_{j2}Z_2 + \cdots + e_{jp}Z_p, \qquad j = 1, 2, \ldots, p$$

In which:

$e_j$ is the normalized eigenvector corresponding to the eigenvalue; $\lambda_j$ of the matrix $R_{p \times p}$ e, ;$Z$ is the matrix of standardized variables.

With this, a score $Y_j$ of each component is obtained for each sample element. The interpretation of the components will be given by the correlation of each variable with each component, which is calculated by: $r_{Y_j,Z_i} = e_{ji}\sqrt{\lambda_j}$

According to Mingoti (2007), the variability system of the $p$ original variables is approximated by the system that contains k principal components ($k < p$), with the quality of the approximation measured through the proportion of the total variability of the data that is

explained by these components. Furthermore, the author emphasizes the importance of using components that have practical interpretation, even if this requires including in the analysis components that have low explanatory power.

According to Love (2011), when studying the relationship between corporate governance and performance, the QTOBIN is used to measure market value. The measurement according to Chung and Pruitt (1994) is presented by: $QTOBIN \cong \frac{VMAO+VMAP+D}{AT}$

In which:

VMAO = market value of the common shares; VMAP = market value of preferred shares; D = book value of debt, defined as current liabilities plus non-current liabilities plus inventories minus current assets; AT = total company assets.

The correlation analysis between two variables aims to identify the degree of relationship between two variables. However, it does not specify whether one variable causes the other. To measure if variable $x_t$ causes variable $y_t$, or if $y_t$ causes variable $x_t$, or even both, the Granger causality test (1969) is used. Therefore, the causality test aims to extrapolate the use of correlation measures, indicating whether there is causality and the direction of causality. According to Greene (2003), there is no Granger causality between $x_t$ and $y_t$ when:

$$f(x_t \,|x_{t-1}, y_{t-1}) = f(x_t \,|x_{t-1})$$

Thus, X Granger causes Y when its past values help predict the present value of Y (Souza, Zanella & Nascimento, 2005). Causality is identified by the F test, with the division of the sample into two subgroups: $F = \frac{[SSE_r - (SSE_1 + SSE_2)/k}{(SSE_1 + SSE_2)/(n-2k)}$

In which:

$SSE_r$ is the sum of the squares of the residuals considering the whole sample; $SSE_1$ is the sum of the squares of the residues of the first subsample; $SSE_2$ is the sum of the squares of the residues of the second subsample; $k$ is the number of lags used and; $n$ is the full sample size.

Thus, the Test F has $n - 2k$ degrees of freedom. If $F > F_{k,n-2k}$, the hypothesis that there is no causality between the variables is rejected (Souza *et al.*, 2005).

## 4    PRESENTATION AND DISCUSSION OF RESULTS

The first dimension is called board composition and includes the variables board size and degree of board independence. The mean and standard deviation for each year, and the total for the period, are presented in Table 1.

**Table 1**

Descriptive statistics for the "board of directors composition" dimension

| Year | Board size Average | Board size SD | Board independence Average | Board independence SD |
|------|--------------------|---------------|----------------------------|------------------------|
| **2010** | 8.9231 | 2.7846 | 0.1808 | 0.2485 |
| **2011** | 9.6538 | 2.1898 | 0.2283 | 0.2474 |
| **2012** | 9.1538 | 1.9327 | 0.2187 | 0.2415 |
| **2013** | 9.6154 | 2.0606 | 0.2351 | 0.2170 |
| **2014** | 8.8462 | 2.4280 | 0.2455 | 0.2442 |
| **2015** | 8.5000 | 2.6115 | 0.3225 | 0.2635 |
| **2016** | 9.0000 | 2.2978 | 0.3718 | 0.2536 |
| **2017** | 9.0385 | 1.9490 | 0.3894 | 0.2388 |
| **Total** | **9.0913** | **2.2897** | **0.2740** | **0.2510** |

Source: Elaborated by the authors (2019).

The average board size was 9.09 (with a minimum of 8.50 and a maximum of 9.65 members), with a standard deviation of 2.2897. In turn, the average for the degree of board independence was 0.2740, with a deviation of 0.2510. According to the work of Ferreira (2012), the same person occupying the roles of CEO and chairman of the board harms efficiency. The second dimension is called manager compensation and involves the variables total compensation to the executive board and variation of this compensation. The average and standard deviation for each year, and the total for the period, are presented in Table 2.

**Table 2**

Descriptive statistics for the "manager compensation" dimension

| Year | Average compensation | Compensation SD | Average variation | Variation SD |
|------|----------------------|-----------------|-------------------|--------------|
| **2010** | 16,899,726.19 | 20,050,015.59 | 1.35 | 3.49 |
| **2011** | 24,602,549.71 | 37,399,906.33 | 0.29 | 0.59 |
| **2012** | 22,786,253.52 | 21,764,037.00 | 0.25 | 0.52 |
| **2013** | 21,679,135.11 | 16,861,610.78 | 0.02 | 0.36 |

| | | | |
|---|---|---|---|
| **2014** | 22,963,477.43 | 17,828,823.87 | 0.59 | 2.37 |
| **2015** | 27,524,780.62 | 24,793,127.99 | 0.19 | 0.94 |
| **2016** | 22,987,913.48 | 19,124,827.64 | 0.08 | 0.71 |
| **2017** | 28,469,738.69 | 31,458,167.80 | 0.41 | 0.84 |
| **Total** | **23,489,196.84** | **24,426,606.53** | **0.40** | **1.63** |

Source: Elaborated by the author (2019).

The year of 2017 had the highest average compensation in the period, with a total amount of R$28,469,739.69, which was higher than the average for the period. The average variation of this compensation was 0.40, with a standard deviation of 1.63. In the context of mergers and acquisitions with an exchange of control, Toigo, Hien, and Kroenke (2018) evaluated the fundamental characteristics between corporate governance and performance of 42 companies between 2006 and 2010. The authors concluded, in general, that the increase in governance mechanisms, together with the superior performance of the firms, assisted in the monitoring of managers by the agents, thus mitigating possible agency conflicts after the change of control. The third dimension is called ownership and control structure, and it includes the variables common shares with the largest shareholder and with the three largest shareholders, number of major shareholders, and cash flow rights. The average and the standard deviation for each year, as well as the total for the period, are presented in Tables 3 and 4.

**Table 3**

Average for the "ownership and control structure" dimension

| Year | Largest ON stock controller | Largest ON3 stock controllers | No. of largest shareholders | Cash flow rights |
|---|---|---|---|---|
| 2010 | 0.39 | 0.59 | 3.35 | 0.27 |
| 2011 | 0.38 | 0.60 | 3.58 | 0.28 |
| 2012 | 0.38 | 0.61 | 3.69 | 0.28 |
| 2013 | 0.37 | 0.60 | 3.77 | 0.28 |
| 2014 | 0.41 | 0.64 | 3.69 | 0.32 |
| 2015 | 0.41 | 0.64 | 3.42 | 0.31 |
| 2016 | 0.38 | 0.60 | 3.65 | 0.29 |
| 2017 | 0.40 | 0.55 | 3.62 | 0.31 |
| **Total** | **0.39** | **0.60** | **3.60** | **0.29** |

Source: Elaborated by the author (2019).

Small variations in the average of the variables presented are observed over the period, especially the largest ON stock controller and cash flow rights. Silva et al (2018) studied the relationship between earnings quality and corporate governance. Audit quality, ownership concentration (ON), differentiated corporate governance segment, participation of financial institutions, and controller's share of cash flows (PN) were the proxies for corporate governance. The authors concluded that earnings quality is influenced by the controller's share of cash flows. When it comes to variability, the standard deviation is presented in table 4.

**Table 4**
Standard deviation for the "ownership and control structure" dimension

| Year | Largest controller | 3 largest controllers | Quantity of majority controllers | Cash flow rights |
|------|------|------|------|------|
| **2010** | 0.23 | 0.27 | 1.47 | 0.16 |
| **2011** | 0.18 | 0.22 | 1.30 | 0.14 |
| **2012** | 0.19 | 0.23 | 1.23 | 0.14 |
| **2013** | 0.18 | 0.22 | 1.18 | 0.14 |
| **2014** | 0.21 | 0.21 | 1.26 | 0.20 |
| **2015** | 0.21 | 0.20 | 1.36 | 0.21 |
| **2016** | 0.18 | 0.20 | 1.29 | 0.14 |
| **2017** | 0.21 | 0.23 | 1.24 | 0.18 |
| **Total** | **0.20** | **0.22** | **1.28** | **0.16** |

Source: Elaborated by the author (2019).

Protection of minority shareholders is the component of the fourth dimension with the variables payout, PN voting rights, internationalization of the company, and reimbursement priority, presented in Table 5.

**Table 5**
Average for the "minority shareholder protection" dimension

| Year | Payout | PN voting rights | Company internationalization | Reimbursement priority |
|------|------|------|------|------|
| **2010** | 0.13 | 0.04 | 0.46 | 0.42 |
| **2011** | 2.95 | 0.04 | 0.58 | 0.38 |
| **2012** | 1.70 | 0.04 | 0.50 | 0.38 |
| **2013** | 1.21 | 0.04 | 0.42 | 0.35 |
| **2014** | 1.03 | 0.04 | 0.50 | 0.35 |
| **2015** | - 9.74 | 0.04 | 0.50 | 0.35 |

| | | | | |
|---|---|---|---|---|
| **2016** | 2.20 | 0.04 | 0.46 | 0.35 |
| **2017** | 0.66 | 0.04 | 0.54 | 0.31 |
| **Total** | **0.02** | **0.04** | **0.50** | **0.36** |

Source: Elaborated by the author (2019).

One can see that there is high variability in the average payout over the period, especially in 2015, the only negative year whose average was -9.74. On the other hand, the preferred stock voting rights variable remained stable throughout the period. The largest standard deviation occurred in the payout due to its variability.

**Table 6**
Standard deviation for the "minority shareholder protection" dimension

| Year | Payout | PN voting rights | Company internacialization | Reimbursement priority |
|---|---|---|---|---|
| **2010** | 0.31 | 0.20 | 0.51 | 0.50 |
| **2011** | 14.51 | 0.20 | 0.50 | 0.50 |
| **2012** | 9.15 | 0.20 | 0.51 | 0.50 |
| **2013** | 6.39 | 0.20 | 0.50 | 0.49 |
| **2014** | 5.22 | 0.20 | 0.51 | 0.49 |
| **2015** | 51.03 | 0.20 | 0.51 | 0.49 |
| **2016** | 11.93 | 0.20 | 0.51 | 0.49 |
| **2017** | 2.34 | 0.20 | 0.51 | 0.47 |
| **Total** | **19.76** | **0.19** | **0.50** | **0.48** |

Source: Elaborated by the author (2019).

The fifth dimension, called transparency, is composed of two variables: effective fiscal council and code of conduct. The average and standard deviation for each year, as well as the total for the period, are presented in Table 7.

**Table 7**
 Average and standard deviation for the "transparency" dimension

| Year | Average code of conduct | Code of conduct SD | Eff. Fiscal council average | Eff. Fiscal council SD |
|---|---|---|---|---|
| **2010** | 0.23 | 0.43 | 3.19 | 1.79 |
| **2011** | 0.27 | 0.45 | 3.38 | 1.72 |
| **2012** | 0.27 | 0.45 | 3.15 | 1.85 |
| **2013** | 0.31 | 0.47 | 3.35 | 1.70 |

| | | | |
|---|---|---|---|
| **2014** | 0.31 | 0.47 | 3.38 | 1.88 |
| **2015** | 0.42 | 0.50 | 3.46 | 1.92 |
| **2016** | 0.42 | 0.50 | 3.65 | 1.96 |
| **2017** | 0.46 | 0.51 | 3.73 | 1.61 |
| **Total** | **0.34** | **0.47** | **3.41** | **1.79** |

Source: Elaborated by the author (2019).

Concerning the code of conduct, the average was 0.34, demonstrating that, in the period, the code of conduct was present 34% of the time, with a standard deviation of 0.47. For the effective fiscal council, the average was 3.41, with variability of 1.79. The last dimension is called audit quality and comprises six variables: length of the auditor-client relationship (tenure); specialization of the audit firm in a given economic sector (expertise); presence of an audit committee (committee); time elapsed between the disclosure of the financial statements by the client company and the audit report by the audit firm (delay); total amount in fees received by the audit firm (fees); and whether the company is more conservative in accounting for facts that affect profit (Conservatism - Basu 1997 model). The average and standard deviation are presented in Table 8.

**Table 8**

Average and standard deviation for the "audit quality" dimension

| Statistics | Tenure | Expertise | Comittee | Delay | Fees | Conservatism |
|---|---|---|---|---|---|---|
| **Average** | 2.9712 | 0.5250 | 0.5845 | 72.8210 | 0.00012 | -0.0043 |
| **SD** | 1.9950 | 0.2737 | 0.4940 | 58.1175 | 0.00010 | 0.0483 |

Source: Elaborated by the author (2019).

Regarding specialization, the total average for the period was 0.5250. The only negative variable was conservatism, with an average of -0.0043.

The proposal in this paper was to build a corporate governance index (IGC) for the companies in the sample, composed of 20 variables distributed in six dimensions of analysis which are: composition of the board of directors, manager compensation, ownership structure and control, protection of minority shareholders, transparency, and audit quality. In order to reduce the number of dimensions and propose an index that is representative of the proxy variables of good corporate governance practices, we used principal component analysis

(PCA). It should be noted that the data underwent a standardization process by subtracting the average and dividing by the standard deviation. The purpose of this procedure is to ensure that the weights in the index are not based on the difference of the measurement unit, but on the variability of the data. Table 9 presents the index results and descriptive statistics.

**Table 9**
Corporate governance index for the sample companies

| Company | IGC | Standard deviation | Minimum | Maximum |
|---------|-----|--------------------|---------|---------|
| VALE3 | 0.7100 | 0.1636 | 0.5569 | 1.0000 |
| EMBR3 | 0.5957 | 0.0391 | 0.5372 | 0.6568 |
| BRFS3 | 0.5693 | 0.0540 | 0.5214 | 0.6652 |
| UGPA4 | 0.5667 | 0.0613 | 0.4357 | 0.6185 |
| LREN3 | 0.5280 | 0.0496 | 0.4751 | 0.5948 |
| CCRO3 | 0.5159 | 0.0345 | 0.4729 | 0.5776 |
| ABEV3 | 0.5010 | 0.0831 | 0.3170 | 0.5727 |
| CSNA3 | 0.4875 | 0.0665 | 0.4272 | 0.6234 |
| NATU3 | 0.4871 | 0.0600 | 0.4311 | 0.5768 |
| FIBR3 | 0.4748 | 0.0540 | 0.4070 | 0.5825 |
| BRKM5 | 0.4386 | 0.0668 | 0.3815 | 0.5764 |
| RAIL3 | 0.4326 | 0.1192 | 0.2882 | 0.5644 |
| CYRE3 | 0.4295 | 0.0262 | 0.3939 | 0.4766 |
| LAME4 | 0.4188 | 0.0455 | 0.3549 | 0.4786 |
| CPLE6 | 0.4184 | 0.0186 | 0.3897 | 0.4457 |
| PETR3 | 0.4001 | 0.0538 | 0.3556 | 0.5297 |
| USIM5 | 0.3926 | 0.0806 | 0.2029 | 0.4634 |
| CMIG4 | 0.3922 | 0.0228 | 0.3686 | 0.4339 |
| CSAN3 | 0.3917 | 0.0229 | 0.3572 | 0.4185 |
| JBSS3 | 0.3818 | 0.0229 | 0.3382 | 0.4154 |
| SBSP3 | 0.3716 | 0.0290 | 0.3191 | 0.4175 |
| CPFE3 | 0.3655 | 0.0475 | 0.3104 | 0.4323 |
| MRVE3 | 0.3624 | 0.1912 | 0.1255 | 0.4772 |
| GOAU4 | 0.3553 | 0.0274 | 0.3036 | 0.3940 |
| BRAP4 | 0.3440 | 0.0165 | 0.3122 | 0.3648 |
| GGBR4 | 0.3340 | 0.0402 | 0.2650 | 0.3921 |

Source: Elaborated by the author (2019)

The governance quality index was calculated by the weighted averages of all generated components (the weights given by their respective variances) as recommended by the principal components analysis. Then, the indicator was adjusted so that the results were in

a range between 0 and 1, in which the higher the value, the better the quality of corporate governance. Silva and Martins (2018), analyzing 213 companies from B3 between 2010 and 2013, estimated a corporate governance quality index. The index showed explanatory relevance by measuring company value and governance from seven representative dimensions (composition of the board of directors, ownership and control structure, manager compensation, transparency, investor protection, audit committee, and information asymmetry). *Vale* was the company that obtained the best IGC of the sample, with an average of 0.7100. From the maximum, it is possible to observe that the company met all the good corporate governance practices in one of the years. On the opposite side of the table are the Gerdau shares (metallurgical and steel company - GOAU4 and GGBR4), with an IGC below 0.4000. Its overall average IGC, as shown in Table 10, was 0.4487, with the highest value in 2017 (0.4861) and lowest value in 2010 (0.3849). This change from 2010 to 2017 means a 26.29% increase in IGC.

**Table 10**
Evolution of the corporate governance index by year

| Year | Average | Minimum | Standard Deviation | Max. |
|------|---------|---------|--------------------|------|
| **2010** | 0.3849 | 0.1255 | 0.1249 | 0.6427 |
| **2011** | 0.4532 | 0.3104 | 0.1387 | 1.0000 |
| **2012** | 0.4428 | 0.2650 | 0.1030 | 0.7405 |
| **2013** | 0.4517 | 0.3432 | 0.0756 | 0.5972 |
| **2014** | 0.4320 | 0.1138 | 0.1062 | 0.6319 |
| **2015** | 0.4685 | 0.2882 | 0.0998 | 0.6794 |
| **2016** | 0.4700 | 0.3495 | 0.0864 | 0.6331 |
| **2017** | 0.4861 | 0.3403 | 0.1283 | 0.9053 |
| **Total** | **0.4487** | **0.2670** | **0.1117** | **1.0000** |

Source: Elaborated by the author (2019)

It should be noted that, in 2014, the lowest average value for the IGC of the entire period was found, which was 0.1138. These results can be seen in Table 10, previously presented. In the research conducted by Peixoto (2012), the objective was to verify the relationship between corporate governance, performance, value, and the risk of companies listed on the B3 in periods of crisis and non-crisis from 2000 to 2009. The main results were: the ownership and control structure was the least relevant mechanism throughout the analyzed period; manager compensation (in a moment of local crisis) was considered the most relevant

corporate governance practice; protection to minority shareholders was the most relevant mechanism (in non-crisis and global crisis periods); and accounting performance and risk did not present a significant relation with the governance quality index.

As for the value, it was found that well-governed companies had higher market value during the global crisis period (2008-2009) and that investors demanded a lower risk-adjusted rate of return from well-governed companies during the American subprime crisis. We also observed the IGC calculated by the companies' category listing on the Brazilian stock market (B3) in Table 11. In the sample, the companies classify as Level I, New Market, and the Traditional segment. The highest average was for the New Market at 0.4788, followed by the Traditional segment, with an average IGC of 0.4629 and, finally, Level I, with an average of 0.3867.

**Table 11**
IGC by listing category

| Category | IGC |
|---|---|
| **Level I** | **0.3867** |
| BRADESPAR | 0.3440 |
| BRASKEM | 0.4386 |
| CIA ENERGÉTICA DE MINAS GERAIS | 0.3922 |
| CIA PARANAENSE DE ENERGIA | 0.4184 |
| GERDAU | 0.3340 |
| LOJAS AMERICANAS | 0.4188 |
| METALÚRGICA GERDAU | 0.3553 |
| USINAS SID DE MINAS | 0.3926 |
| **New Market** | **0.4788** |
| BRF | 0.5693 |
| CCR | 0.5159 |
| CIA SANEAMENTO BASICO SP | 0.3716 |
| COSAN S.A. INDÚSTRIA E COMÉRCIO | 0.3917 |
| CPFL ENERGIA S.A | 0.3655 |
| CYRELA BRAZIL | 0.4295 |
| EMBRAER | 0.5957 |
| FIBRIA | 0.4748 |
| JBS | 0.3818 |
| LOJAS RENNER | 0.5280 |
| MRV | 0.3624 |
| NATURA | 0.4871 |

| | |
|---|---|
| RUMO S.A | 0.4326 |
| ULTRAPAR | 0.5667 |
| VALE ON | 0.7100 |
| **Traditional** | **0.4629** |
| AMBEV | 0.5010 |
| CIA SIDERURGICA | 0.4875 |
| PETROBRAS ON | 0.4001 |
| **Total** | **0.4487** |

Source: Elaborated by the author (2019).

According to Silva et al. (2018), the quality of earnings is influenced by participation in some of the special corporate governance segments. For Alexandre and Lopes Junior (2018), companies listed in the highest levels of corporate governance, in the telecommunications sector, tend to have non-conformities in their reports. Through the data in Table 12, it is possible to observe the variation of the best corporate governance practices by audit firm size.

**Table 12**
IGC by firm

| Firm | Average IGC |
|---|---|
| **Big Four** | **0.4498** |
| DTT | 0.4369 |
| EY | 0.4500 |
| KPMG | 0.4724 |
| PwC | 0.4372 |
| **Não Big Four** | **0.4261** |
| Baker Tilly | 0.5825 |
| BDO | 0.3925 |
| Grant Thorton | 0.5387 |
| **Total** | **0.4487** |

Source: Elaborated by the author (2019)

It can be seen that, on average, the Big Four have superior corporate governance quality. However, if analyzed separately, Baker Tilly is the auditing firm that shows the most sophisticated corporate governance mechanisms, not the Big Four. However, it is worth noting the small number of companies audited by this firm in the sample. In second place, there is also a non-Big Four audit firm, Grant Thorton. The fact that the first two places were

occupied by non-Big Four firms contradicts Aljifri and Moustafa's (2007) statement that a company audited by a Big Four firm has a significant chance of having good corporate governance practices. The PCA allows one to ascertain the weight that each of the six dimensions exerts on the IGC. The results are presented in Table 13.

**Table 13**
Weights of the six governance dimensions in the IGC

| Dimension | Weight |
|---|---|
| Board of director composition | 0.1015 |
| Manager compensation | 0.1665 |
| Ownership structure and control | 0.1399 |
| Minority shareholder protection | 0.2033 |
| Transparancy | 0.0801 |
| Auditing quality | 0.3087 |
| **Total** | **1.0000** |

Source: Elaborated by the author (2019).

When identifying the contribution of each dimension to the IGC, it was possible to verify that the audit quality dimension has the most weight in the index, with 30.87%. This dimension includes the variables Tenure, Expertise, presence of the audit committee, audit delay, fees, and conservatism. This value shows the importance of independent auditing for the best corporate governance practices. Next, the importance of protection to minority shareholders is highlighted, with a weight of 20.33%, and manager compensation, at 16.65%. Protection of minority shareholders is composed of payout, company internationalization, PN voting rights, and reimbursement priority. Manager compensation, on the other hand, comprises the total compensation to the executive board, as well as its variation over the period.

Putting the best corporate governance practices in order of relevance, the composition of the board of directors came in second to last place. Erkens, Hung, and Matos (2009) researched the corporate governance performance of 296 financial companies during the 2008 global crisis, concluding that boards with more independence had greater fundraising opportunities. Following this reasoning, transparency, constituted by the proxies code of conduct and fiscal council, appeared last. However, in Baioco and Almeida's work (2017), the

results indicated that the presence of a permanent fiscal council could be considered an efficient corporate governance practice.

The Granger causality test was used to verify the relationship between corporate governance and performance. This test goes beyond using correlations between variables because correlation alone does not imply a cause-and-effect relationship. When studying the relationship between QTOBIN and corporate governance, Bris, Brisley, and Cabolis (2008) found an upward trend when international companies with good governance conditions (shareholder protection and accounting standards) made acquisitions. Using time-series data, a p-value of 0.0178 (for QTOBIN) was found. For this test, the hypotheses were as follows:

**$H_0$:** IGC does not cause market value

**$H_1$:** IGC cause market value

At 5% significance, with the p-value obtained for QTOBIN (1.78%), the null hypothesis is rejected, that is, IGC causes market value (measured by QTOBIN). Bris, Brisley, and Cabolis (2008) found evidence of increasing and positive relationships between improvements in corporate governance and the market valuation of these firms. Good corporate governance practices can provide shareholders with more equal rights and protection (Vieira et al. 2011).

## 5 FINAL CONSIDERATIONS

For a company to go public, a series of changes are required to adapt to B3's requirements. After going public, companies need to pay attention to the quality of the accounting information that will be reported to current and future shareholders and other stakeholders. The company must preserve its reputation, depending on positive signals issued to the market to increase its market value. The objective of this work was to construct a corporate governance index - IGC 2019 for Ibovespa companies between 2010 and 2017 and to analyze the relationship between this index and the companies' market value. The article contributes, in particular, to the perception of audit quality as an important aspect of good corporate governance practices. The corporate governance index was built using the principal components method, with the observed dimensions: composition of the board of directors, ownership and control structure, manager compensation, minority shareholder protection, transparency, and independent audit quality. Next, the relationship between the corporate

governance index and the market value of the companies was analyzed using Granger causality.

In conclusion, audit quality is the most relevant dimension for good corporate governance practices at 30.87%, followed by minority shareholder protection at 20.33%; manager compensation at 16.65%; structure of ownership and control at 13.99%; composition of the board of directors at 10.15%; and, finally, transparency at 8.01%. Furthermore, it is concluded that the use of good corporate governance practices by companies influences their market value. The main results of the article empirically confirm the theory of the importance of audit quality for better corporate governance practices. The results also confirm the relationship between good corporate governance practices and the market value of the companies. One limitation of this research is that the sample consisted only of the Ibovespa companies, excluding the other companies listed on B3. For future research, the authors suggest the expansion of the sample to include those companies, including the financial sector.

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