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ANALYSIS OF THE EFFECTS OF DIVIDEND SMOOTHING ON THE RELEVANCE OF ACCOUNTING INFORMATION IN BRAZIL

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ABSTRACT

This article aimed to analyze the effects of dividend smoothing on the relevance of accounting information. By estimating Lintner's partial adjustment dividend model (1956), the variable dividend adjustment speed (c_i) *proxy* for dividend smoothing was extracted, which was included in the relevance model of the accounting information of Collins, Maydew & Weiss (1997). As a result, it was possible to point out that there is little dividend smoothing in Brazil and that this variable has positive and negative effects, respectively, on earnings and shareholders' equity. From these results, it is possible to infer that, due to their aversion to the risk of expropriation, minority investors would tend to demand the maximum possible dividends and the minimum retained earnings, regardless of investment opportunities. The results observed converge towards the acceptance of the outcome model, which implies that the dividend smoothing should be considered as a monitoring instrument as a way of increasing the explanatory power of accounting information and minimizing the risk of expropriation of minority shareholders.

Keywords: Smoothing dividends. Relevance of accounting information. Outcome model. Substitution model.

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1 INTRODUCTION

The idea of the relevance of accounting information is linked to its ability to change investors' perceptions about a certain economic reality about the events that change the entities' assets. That is, accounting, when relevant, is able to accurately capture and transmit to market agent's information about the organizations' prospects.

Given this conception, the relevance of accounting information can be understood as the ability of the set of financial statements to capture and summarize information that determines the intrinsic value of a firm (Beisland, 2009), being usually identified by the statistical relationship between accounting information and the stock price.

The relevance of accounting information can be considered as one of the attributes of its quality, which is capable of reducing agency conflicts and problems of information asymmetry between economic agents by mediating the establishment of contractual relations between agent and principal.

Based on this proposition, it is assumed that the relevant accounting information contributes to the protection of investors (principal) against the risks of expropriation arising from the discretionary acts of managers (agent), thus being considered a corporate governance mechanism (La Porta, Lopez de Silanes, Shleifer & Vishny, 2000b).

La Porta *et al.* (2000b) state that corporate governance is the set of mechanisms that minimize the probability of expropriation of the principal by the agent, protecting the capital suppliers by law (laws and regulations) and their application (enforcement), among which are included the norms and standards for the preparation and disclosure of accounting information.

It is possible to point out that the relevance of accounting information is linked to corporate governance and that it cannot be analyzed independently of it (Lopes, Walker & Silva, 2016). In scenarios of agency conflicts, the relevant accounting information works in favor of the principal as a monitoring mechanism that contributes to the reduction of information asymmetry problems, thus enabling capital suppliers to monitor the agent's performance more obtaining a return on the investments made.

However, the corporate governance environment and, consequently, the ability of accounting information to inform the economic reality to its users, depend on the stage of development of the capital market and on the characteristics of the legal regime to which organizations are exposed (La Porta *et al.*, 2000a, 2000b). In the Brazilian case, the characteristics are derived from the code law legal regime, which has idiosyncrasies such as weak investor protection (La Porta *et al.*, 2000a, 2000b) and an incipient corporate governance culture (Lopes *et al.*, 2016).

These factors can be understood as a product of the deficient legal content and its weak application (La Porta *et al.*, 2000a, 2000b), which results in an institutional arrangement characterized by a high degree of concentration of ownership and control (Aldrighi & Mazzer Neto, 2005), the prevalence of the use of internal sources of funds and bank credit as a form of financing to the detriment of the issuance of debt and equity securities (Gonçalves, Silva & Borges Júnior, 2018) and the low quality of accounting information provided to the market (Lopes *et al.*, 2016).

From the perspective of information to shareholders, such attributes of the code law legal regime create a favorable environment for informational imbalances and for the emergence of agency conflicts between controlling and minority shareholders, which, according La Porta *et al.* (2000a), results in a greater probability of expropriation of capital suppliers through the dividend policy and in lower levels of earnings distribution.

For La Porta *et al.* (2000a), the confirmation of this hypothesis lies in the empirical observation that companies that operate in corporate governance environments with a good level of legal protection (common law legal regime markets) of investors, present higher levels of payment of dividends when compared with companies operating in environments with weak legal protection (code law legal regime markets). This observation suggests evidence of

misallocation of resources in countries with a code law legal regime, since investors who do not feel protected by the corporate governance environment tend to claim as much dividends as possible (regardless of investment opportunities) as a form of protection.

Thus, the dividend policy can be used as a strategy for aligning interests between agent and principal, in which investors demand high and stable levels of payment of dividends, forcing a reduction in the level of free cash flow available to managers. This exposes firms to the disciplinary effects of the market (Easterbrook, 1984; Jensen, 1986; La Porta *et al.*, 2000a; Michaely & Roberts, 2012), helping external agents to monitor the performance of organizations and guarantee the return by their investment (La Porta *et al.*, 2000a, 2000b).

As one aspect of dividend policy, dividend smoothing appears to play a relatively important role in reducing agency conflicts, as it is inversely related to the level of legal protection for investors (Javakhadze, Ferris & Sen, 2014; Leary & Michaely, 2011).

The phenomenon called dividend smoothing was initially documented by Lintner (1956) and can be defined as the stabilization, maintenance and gradual increase in the payment of dividends through the partial adjustment of earnings to a rate representative of an ideal level of payment of dividends, which results in the slow incorporation of earnings to the level of dividends paid (Al-Najjar & Kilincarslan, 2017; Fama & Babiak, 1968; Leary & Michaely, 2011; Lintner, 1956).

Javakhadze *et al.* (2014) note that the dividend smoothing, in addition to business characteristics, is due to the level of legal protection. The authors point out that in environments with a common law legal regime, characterized by strong legal protection, there is less propensity for organizations to practice dividend smoothing. That is, in these environments, the set of legal prerogatives is sufficient to avoid expropriations of the principal by the agent, thus resulting in the tendency to pay higher levels of dividends and a lesser degree of smoothing dividends.

On the other hand, Javakhadze *et al.* (2014) present evidence that the dividend smoothing is practiced to a greater degree by firms located in countries governed by the code law legal regime. For the authors, the observation of this result is justified by the fact that the dividend smoothing can be understood as a substitute for deficiencies in the level of legal protection, making it possible, through the distribution of predictable levels of dividends, to establish a reputation for corporate transparency and non-expropriation of investors.

In view of the aforementioned body of evidence, the starting point for characterizing the literature gap to be studied in this research lies on the analysis of the effects described above, namely: the result and substitution models of dividends.

i) outcome model: in environments of strong legal protection, accounting information contributes to the mediation of agency contractual relations, allowing investors to prospect on the fundamentals of organizations and demand an adequate level of dividends (Ball, Kothari & Robin, 2000; Lopes *et al.*, 2016). In these circumstances, the dividend smoothing becomes unnecessary (Javakhadze *et al.*, 2014), since the legal prerogatives are sufficient to avoid or minimize the risks of expropriation.

ii) substitution model: in environments with weak legal protection, it is expected that a high or moderate level of dividend smoothing is observed so that it functions as a substitution mechanism for deficient legal protection (Leary & Michaely, 2011; Javakhadze *et al.*, 2014), contributing to greater interaction between organizations and the capital market and, consequently, to a greater degree of protection for investors (principal). In this case, it is expected that the accounting information has a lower degree of relevance due to the imperfections of the corporate governance environment imposed by the code law legal regime in which private information channels are privileged.

At this point, as far as it was possible to verify, the topic has incipient literature, especially with regard to the effects of smoothing dividends on the proxies of quality of accounting information. Thus, when considering the relationships described so far, it is observed

that there are gaps in the accounting literature regarding the analysis of the effects of smoothing dividends on the quality of information.

In view of what was exposed in the previous paragraphs, the following question guides the development of this work: what is the effect of smoothing dividends on the relevance of accounting information in Brazil?

In order to answer the guiding question of this research, the dividend smoothing was measured by estimating the Lintner's partial adjustment model (1956), from which the variable called the dividend adjustment speed (c_i) was extracted, which was later introduced in the Collins, Maydew and Weiss (1997) relevance model of accounting information. Thus, this work aimed to analyze the effects of smoothing dividends on the relevance of accounting information, seeking to contribute to a greater understanding of how accounting information, in the face of smoothing dividends, permeates contractual relations in a market environment emerging and characterized by a code law legal regime.

This research is justified by taking the relationship between controlling shareholders (agent) and minority investors (principal) as the underlying premise of the study, in an attempt to shed light on the factors that should be critically observed by investors when selecting assets for the composition of their portfolios. That is, the investigation of the effects of the dividend smoothing on the relevance of accounting information is useful for minority investors to identify companies that demonstrate to be aligned with the non-expropriation of minority investors and with the maximization of shareholder value, contributing to the valuation the current and future performance of companies and managers, enabling diagnoses and reviews in the analysis of return and the cost of capital for investment alternatives.

After this introduction, this work is structured as follows: the second section corresponds to the theoretical foundation and in the third, the research methodology is presented. In the fourth section, the results are presented. Finally, the conclusion with the reflections and contributions of the research.

2 RELATIONSHIP BETWEEN DIVIDEND SMOOTHING AND THE RELEVANCE OF ACCOUNTING INFORMATION

This work takes as a starting point the theoretical proposal that the relevance of accounting information and the dividend smoothing can be understood as monitoring mechanisms by investors. This is due to the fact that both the quality of accounting information and the dividend smoothing are influenced by the corporate governance environment (Ball *et al.*, 2000).

In order to understand the hypotheses launched in this research, it is necessary that the relationship between the dividend smoothing and the relevance of accounting information must be evaluated sparingly, especially with regard to the way in which these aspects may permeate contractual relations and thus minimize conflicts agency between agent and principal.

Initially, Ball *et al.* (2000) point out that the relevance of accounting information is directly related to the corporate governance environment to which organizations are exposed and that due to this fact, considering the characteristics of code law legal regime markets, Accounting tends not to have such conditions favorable to exercise its function of mediating contractual relations between agent and principal and thus function as a monitoring mechanism for investors.

This is because the variation in the prices of securities traded on the capital markets of countries that have a low level of legal protection, in theory, responds more significantly to political or economic variables, thus evidencing that investors do not consider the information accounts as relevant enough to prospect about their investments and price the securities traded (Morck, Yeung & Yu, 2000).

Lopes *et al.* (2016) characterize the Brazilian corporate governance environment as incipient. The authors point out that the Brazilian market presents inflationary problems,

economic instability and strong state intervention in the economy, which contributes to the preparation and disclosure of low quality (relevant) accounting information.

In view of these concepts, it is possible to point out that the relevance of accounting information is positively related to the corporate governance environment. That is, the higher the level of legal protection, the greater the capacity of Accounting to mediate contractual relations between agent and principal, contributing to the monitoring of contract performance through the reduction of information asymmetry problems and consequently reducing agency costs derived from expropriation risks.

On the other hand, the dividend smoothing proves to be inversely related to the corporate governance environment. The justification for this observation is that the dividend smoothing is used as a substitution mechanism for corporate governance in environments of weak legal protection (Javakhadze *et al.*, 2014; Leary & Michaely, 2011), that is, the more severe the agency conflicts between agent and principal, the greater the degree of dividend smoothing tends to be.

The dividend smoothing would function as a mechanism for aligning interests between agent and principal, as it provides a greater degree of interaction between organizations and the capital market (Easterbrook, 1984), reducing the level of free cash flow available to management, contributing, thus, to reduce possible agency costs of free cash flow (Jensen, 1986), which results in greater corporate transparency in terms of building and maintaining a reputation for not expropriating investors (Javakhadze *et al.*, 2014; Leary & Michaely, 2011).

It can be said that the dividend smoothing restricts the discretion of management acts regarding the allocation of free cash flow, thus limiting investors to be expropriated through the acceptance of investments, generally of negative net present value, which executives benefit particularly in the short term, for example, by overpaying wages and bonuses.

Based on what has been discussed so far, the effect of smoothing dividends on the relevance of accounting information is analyzed in the light of outcome and substitution models.

The Outcome Model predicts a positive relationship between the level of legal protection and the level of dividends practiced by organizations (La Porta *et al.*, 2000a). The conception of this relationship takes into account that the effective exercise of legal prerogatives by investors is capable of minimizing possible opportunistic behaviors of management regarding the use of free cash flow (Jensen, 1986), representing, therefore, less exposure of investors to agency conflicts and problems of information asymmetry and less need to smoothing dividends (Javakhadze *et al.*, 2014).

As a consequence, it is expected that in environments of effective legal protection, there will be a greater relevance of accounting information, allowing investors to monitor the performance of contracts and demand an adequate level of dividends, capable of inhibiting opportunistic behavior and minimizing risks of expropriation.

The outcome model configures the product of the level of legal protection in which the establishment of contractual relationships based on the principle of "arm's length transaction[1]" prevails. From this perspective, it is possible to infer that the practice of high levels of dividends is due to more relevant accounting information (La Porta *et al.*, 2000a; Lopes *et al.*, 2016).

For environments with weak legal protection, the theoretical proposals mentioned above are not expected to be sustained (La Porta *et al.*, 2000a). Considering the deficiencies of the corporate governance environment derived from the code law legal regime, it is possible to say that publicly-held companies have little exposure to market discipline and that, as a result, minority investors tend to demand as much dividends as possible, thus resulting in less dividend smoothing.

[1] Principle that governs a contractual relationship in which the parties are independent, that is, there are no informational advantages.

Concurrently, the Substitution Model recommends that the level of payment of dividends works as a substitute for environments of weak legal protection, that is, companies operating in market environments with a code law legal regime tend to present agency conflicts more stringent, and as a result they can use the dividend policy to build and maintain a reputation for not expropriating investors (La Porta *et al.*, 2000a).

Thus, in environments of weak legal protection and little transparency, it is natural that companies with better growth prospects are more likely to adopt practices capable of highlighting them as entities that commit to a higher level of transparency and alignment between the contracting parties (Lopes *et al.*, 2016).

To this end, organizations start to operate with a lower level of free cash flow, given the payment of higher levels of dividends, which leads to a greater need for interaction with the capital market to obtain external sources of financing.

Under the aegis of the substitution model, the dividend policy therefore constitutes a mechanism for aligning interests between agent and principal, contributing to the reduction of agency conflicts and problems of information asymmetry through the dividend smoothing and the practice of greater levels of payment of dividends, given the less relevance of accounting information, characteristic of market environments under code law legal regime.

In summary, the literature treats the outcome and substitution models as alternatives, that is, while the first points to a positive relationship between the level of dividends and the legal protection environment, the second predicts an inverse relationship.

3 METHODOLOGY

According to the objective and the research problem, this study adopts a quantitative approach characterized as empirical-positivist, putting the testing of theoretical predictions from the observation of empirical results of econometric models in order to explain how relationships occur in the concrete world. In addition, this research has a descriptive nature, as its design was structured in order to describe the observed relationships and thereby make it possible to analyze the effects of smoothing dividends on the relevance of accounting information.

3.1 Population and Sample

The research universe comprises all companies listed in Brazil, Bolsa and Balcão (B3) with active registration in the data collection period held in July 2018. For the formation of the analyzed population, the following criteria were considered: i) exclusion of companies with incomplete or unavailable economic-financial data; ii) disregard of companies with negative shareholders' equity, as they are companies with discontinuity characteristics; iii) withdrawal of companies that did not provide complete information on the dividend policy, necessary to calculate any of the study variables; iv) consideration of companies that distributed dividends uninterruptedly during the research period (Javakhadze *et al.*, 2014); and; v) for companies that trade more than one type of share, the one with the highest liquidity was selected.

The use of the aforementioned set of criteria is based on the need to select companies that pay dividends on an uninterrupted basis. This is due to the fact that the dividend smoothing can only be studied and captured in companies that make the payment of dividends, which, in cases where companies with incomplete data, unavailable or that did not distribute dividends uninterruptedly in some of the years from the time horizon, it becomes unfeasible because of the estimation of Lintner's partial adjustment model (1956).

In addition, companies that did not meet the criteria for training the researched population in any of the years that comprise the research time horizon were also excluded. Such a procedure is marked by the uniformity and comparability of the results, which is not feasible in econometric analyzes with unbalanced data sets.

Thus, 41 securities were selected, being 25 ordinary and 16 preferred. Such securities are distributed in the following sectors: (i) industrial goods (6); (ii) cyclical consumption (9); (iii) non-cyclical consumption (4); (iv) financial (8); (v) basic materials (4); (vi) oil, gas and biofuels (1); (vii) health (1); (viii) information technology (1); and, (ix) public utility (7), the latter sector being composed of the gas (1), sanitation (2) and electric energy (4) segments.

Data collection was done through the Economatica® database. Data were collected on an annual basis for the period between 2010 and 2017. The choice for this period was due to the complete adoption of international accounting standards by Brazil, which justifies a greater uniformity of research proxies and econometric results. Thus, for the operationalization of the econometric model presented in the next section, 41 securities were considered for analysis, over a period of seven years (2011-2017). The choice for this time horizon is justified by the need to use the dividend variable at *t-1*. Therefore, the data were collected covering the period 2010-2017 and the econometric analyzes are related to the period 2011-2017.

3.2 Econometric models

3.2.1 Measurement of dividend smoothing

The key factor in understanding the practice of smoothing dividends is the conditioning of current earnings to an ideal level of long-term dividend payment, which for Lintner (1956, p. 102) is "[...] the factor most important in determining any change in dividends".

Thus, for each year *t*, a level of dividend payment $D_{i,t}$ is established for firm *i*, which is obtained by the product of the current earnings $E_{i,t}$ of company i at time *t* and the ideal dividend payment rate r_i.

$$D_{i,t} = r_i E_{i,t} \quad (1)$$

The conditioning of current earnings by an ideal dividend payment rate ensures a consistent pattern without drastic changes that may be reversed in the level of dividend payment from one period to the next, in view of the uncertainty of operations (Lintner, 1956).

The ideal dividend payment rate, therefore, reflects the establishment of a reasonable and well-defined policy for a series of dividend payments with respect to the speed with which current earnings are incorporated into the dividend level of the immediately preceding period (Lintner, 1956).

It can be said, then, that the postulation of an ideal level of dividend payment conditions the earnings distribution policy to a partial and continuous adjustment of earnings in order to guarantee dividends paid a stable and gradual growth pattern over time, while contributing to minimize the risk of negative market reactions by reducing the likelihood of cuts in the level of dividend payments.

Considering the aforementioned propositions, the adjustment model is expressed as:

$$\Delta D_{i,t} = \alpha_{i,t} + c_i\left(D_{i,t} - D_{i,t-1}\right) + \varepsilon_{i,t} \quad (2)$$

Being:

$\Delta D_{i,t}$ the variation in the dividends of company *i* at time *t*, obtained from the difference between the level of dividends $D_{i,t}$ and the dividends $D_{i,t-1}$ paid by company *i* in the immediately preceding period *t-1*;

$\alpha_{i,t}$ indicates management's reluctance to cut dividends;

c_i corresponds to the coefficient that captures the speed of adjustment by which the change in dividends responds to changes in current earnings adjusted by the ideal dividend payment rate; and,

$\varepsilon_{i,t}$ is the error of the partial adjustment model.

By substituting the first equation for the second, it is possible to obtain:

$$\Delta D_{i,t} = \alpha_{i,t} + c_i\left(E_{i,t}r_i - D_{i,t-1}\right) + \varepsilon_{i,t} \quad (3)$$

From where it is possible to extract:

$$\Delta D_{i,t} = \alpha_{i,t} + c_i E_{i,t}r_i - c_i D_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

In view of the mathematical formulations, Andres, Betzer, Goergen & Renneboog (2009) explain that, through the partial adjustment model, it is possible to capture the speed at which the level of dividend payment is adjusted according to the long-term guidelines established by management for the dividend policy in relation to changes in earnings.

The dividend adjustment speed coefficient, $D_{i,t-1}$ therefore, is the most interesting parameter of the model, as it measures the propensity of company *i* at time *t* to practice dividend smoothing, since the partial adjustment model, in fact, indicates how the variations in current earnings adjusted by the optimal level of dividend payment are incorporated into dividends $D_{i,t-1}$ in order to explain variations in the level of dividend payment.

Finally, the model can be operationalized as follows:

$$\Delta D_{i,t} = D_{i,t} - D_{i,t-1} = \alpha_{i,t} + c_i E_{i,t}r_i - c_i D_{i,t-1} + \varepsilon_{i,t} \quad (5)$$

Resulting in:

$$D_{i,t} = \alpha_{i,t} + c_i E_{i,t}r_i - c_i D_{i,t-1} + D_{i,t-1} + \varepsilon_{i,t} \quad (6)$$

Therefore:

$$D_{i,t} = \alpha_{i,t} + c_i E_{i,t}r_i + (1 - c_i)D_{i,t-1} + \varepsilon_{i,t} \quad (7)$$

From where the following regression model is extracted:

$$D_{i,t} = \beta_0 + \beta_1 D_{i,t-1} + \beta_2 E_{i,t} + \varepsilon_{i,t} \quad (8)$$

Being:

$\beta_0 = \alpha_{i,t}$ and represents management's reluctance to reduce the level of dividend payments;

$\beta_1 = 1 - c_i$ which results in $c_i = 1 - \beta_1$; and,

$\beta_2 = c_i r_i$ where the optimal level of dividend payment can be calculated from $r_i = \beta_2 / c_i$.

As proposed by Lintner (1956), the coefficient of adjustment speed shows the magnitude of the reaction of the dividend policy to permanent variations in current earnings. For this proposition to be true, the adjustment speed coefficient must be included in the range $0 < c_i < 1$.

Values close to 1 indicate little or no adjustment of dividends to changes in earnings, implying that the level of dividend payment is exposed to non-permanent changes in earnings. On the other hand, values close to 0 capture the practice of smoothing dividends through the verification of partial and continuous adjustments of current earnings towards an ideal level of dividend payment established based on long-term management expectations.

Following the modeling procedures of Fama & Babiak (1968), Andres et al. (2009), Leary & Michaely (2011) and Al-Najjar & Kilincarslan (2017), for this research, the partial adjustment model was estimated as data per share (firm level data), which according to the authors, consists of the specification most econometric approach.

For the estimation of the Lintner's partial adjustment model (1956) the variables "dividends in *t*" e "dividends in *t-1* comprise the amounts of dividends and interest on own capital, since the latter have the same effect as the payment of dividends (Galvão, 2015, p. 41).

3.2.2 The relationship between the dividend smoothing and the relevance of accounting information

Given the impossibility of generating a time series of the dividend adjustment speed for estimating regressions with panel data, the relationship between smoothing dividends and the relevance of accounting information was estimated considering cross-section data.

Thus, a regression was estimated for each company, a component of the research population, with the purpose of knowing, individually, the speed of adjustment of dividends and thereby obtaining a variable that can be used according to the scope proposed in this research. . This methodological strategy is supported by the research by Leary & Michaely (2011), Jeong (2013), Javakhadze et al. (2014) and Syed, Zainir & Isa (2018), in which the estimation of dividend smoothing was done through individual regressions with cross-section data.

Thus, the model by Collins et al. (1997) was initially estimated with cross-section data, considering the variables for the analysis period (2011-2017), according to Equation 9.

$$P_i = \beta_0 + \beta_1 LL_i + \beta_2 PL_i + \varepsilon_i \quad (9)$$

Being:

P_i is the stock price of company *i* observed at the end of the first quarter of the fiscal year following the closing of the financial statements;

LL_i corresponds to the net earnings of company *i*;

PL_i represents the shareholders' equity of company *i*;

ε_i is the term of stochastic error.

To meet the objectives set, the speed of adjustment of dividends was included in the model by Collins et al. (1997) in order to examine the incremental association of smoothing dividends on the relevance of accounting information. That is, the inclusion of the variable dividend adjustment speed () is due to the need to investigate by comparing the statistical significance of the model parameters whether the dividend smoothing has incremental power over the relevance of accounting information. The Collins *et al.* (1997) is estimated according to Equation 10:

$$P_i = \beta_0 + \beta_1 LL_i + \beta_2 PL_i + \beta_3 c_i + \beta_4 LL_i c_i + \beta_5 PL_i c_i + \varepsilon_i \quad (10)$$

In terms of theoretical predictions, the dividend smoothing and the relevance of accounting information are inversely related: it is expected that a greater speed of adjustment of dividends will imply a statistically significant relationship and result in an increase in the

explanatory power of the Collins *et al.* (1997), indicating that companies that smooth less tend to present more relevant accounting information.

Finally, there was a great heterogeneity in the data and the non-normality of the residues in the estimation of the model adapted from Collins *et al.* (1997). Although it is possible for the hypothesis of normality to be relaxed, since this research seeks only to describe the observed relationships (and not to make predictions), due to the small number of observations (41), it was used as a robustness test, quantum regression model by Koenker & Basset (1978), to assess the behavior of the estimated coefficients, as it is a robust semiparametric method for outliers, heteroscedastic residues and non-Gaussian distributions.

Furthermore, the model by Collins *et al.* (1997) was also estimated with the inclusion of dummy variables for the energy and financial sectors, which are known to pay the highest dividend amounts in Brazil. However, these variables were not significant for the analyzed data set and their inclusion did not change the estimates made for the other coefficients, therefore, they are not relevant for the purposes of this research, and, therefore, are not shown below.

4 RESULTS

4.1 Descriptive statistics analysis

Table 1 presents the descriptive statistics of the variables used to estimate the Collins *et al.* (1997) and the variable speed of adjustment of dividends, obtained from the estimation of the Lintner's partial adjustment model (1956) by companies.

Table 1
Descriptive statistics of the relevance model of accounting information

Metrics	Stock price	Lpa	Plpa	Adjustment Speed
Average	28.5305	2.0071	15.9400	0.6245
Standard deviation	46.2179	2.2293	14.8461	0.2563
Minimum value	2.3598	-0.1134	1.1194	0.1036
Maximum value	297.2051	10.8969	68.0783	0.9579

Source: Research data.

From the data shown in Table 1, it can be seen that the behavior of stock price in the Brazilian capital market is quite heterogeneous, given the high degree of dispersion obtained from a standard deviation of R$ 46.21 and a coefficient of variation in the order of 161.99%.

With a similar behavior, the variables earnings per share and shareholders' equity per share also show great dispersion, which results in coefficients of variation of 111.07% and 93.13% for earnings per share and shareholders' equity per share, respectively, mainly due to the lack of extreme values (minimum and maximum).

Finally, the dividend adjustment speed (c_i) showed an average of 0.6245, indicating that in Brazil, the average behavior is that the current earnings is quickly incorporated into the current level of dividend payment. However, for this variable, it is also possible to observe a large amplitude for the maximum and minimum values, which contributes to the high degree of dispersion of the observations around the average, a fact confirmed by the observation of a coefficient of variation of 41.04 %.

In view of the observation of the data characteristics, it is possible to conclude that the variables used to estimate the relevance of accounting information present a very heterogeneous pattern, common to the Brazilian market, in which the average can be understood as a biased measure of the values due to the existence extreme values and large levels of dispersion.

4.2 Regression Analysis

In this section, the results of the estimations of the model by Collins *et al.* (1997) in its original and adapted specification, in order to diagnose and reflect on the implications of the outcome model or the substitution model for the relevance of accounting information are presented.

Below, Table 2 presents the results of the estimation of the Collins *et al.* (1997) in its original specification, according to equation 9.

Table 2
Results of the Collins *et al.* (1997) original

Variable	Coefficient	Standard error	Statistics t	p-value
Intercept	10.152	1.6750	6.1580	0.0000
Lpa	3.9289	0.8598	4.5700	0.0000
Plpa	0.1727	0.0935	1.8470	0.0712
R^2 Adjusted			0.4725	

Source: Research data.

As a result, the model by Collins *et al.* (1997) proved to be significant at 1% and presented a coefficient of determination (R^2 adjusted) of 47.25%, indicating that for the analyzed data set, variations in earnings and shareholders' equity account for approximately 50% of the variance in the stock price.

As for the analysis of significance, both independent variables were positively related to the stock price and significant at 1% and 10%, respectively, indicating that earnings and shareholders' equity are reflected in the stock price, and therefore can be considered relevant.

The observation, in this research, of the positive relationship between the stock price and the earnings and shareholders' equity variables corroborates the body of empirical evidence presented in the works of Macedo, Machado & Machado (2013) and Gonçalves, Batista, Macêdo & Marques (2014) that accounting information contributes to the exploration of organizational fundamentals, contributing to a greater monitoring of management by investors.

When taking into account the weak level of legal protection and the deficient corporate governance environment inherent to the Brazilian capital market, it is possible to say, based on the observed results, that the accounting information, both for the findings of this research and for the body empirical evidence cited, favors greater alignment in the establishment and maintenance of contractual agency relationships.

Next, the model by Collins *et al.* (1997) was estimated in its adapted form, in which the variable speed of adjustment of dividends was included in the model along with the accounting variables, in order to examine the interactions between the speed of adjustment of dividends with earnings and shareholders' equity, in an attempt to understand the consequences of smoothing dividends for the analysis of the relevance of accounting information.

Table 3 presents the results of the Collins et al. (1997) model adapted, according to Equation 10.

Table 3
Results of the Collins *et al.* (1997) model adapted

Variable	Coefficient	Standard error	Statistics t	p-value
Intercept	12.1729	4.433	2.746	0.0087
Lpa	-2.1289	1.6159	-1.317	0.1946
Plpa	0.5684	0.2701	2.104	0.0412
Ci	-13.0592	6.8888	-1.896	0.0647
Lpa * Ci	20.6592	5.6552	3.654	0.0006
Plpa * Ci	-1.0317	0.4512	-2.286	0.0272
R^2 Adjusted			0.7225	

Source: Research data.

Initially, Collins *et al.* (1997) model adapted proved to be significant at 1%, presenting a coefficient of determination (R^2 Adjusted) in the order of 0.7225, which indicates that, for the analyzed data, the set of independent variables explains in 72.25% the variance of the stock price.

Regarding the analysis of the significance of the independent variables, it is possible to observe that the speed of adjustment of the dividends proved to be significant at 10% and negatively related to the stock price, which indicates that a greater speed of adjustment of dividends would be associated with negative variations in the stock price.

In fact, this result is plausible from the point of view of the outcome model that advocates that a lesser degree of dividend smoothing would be perceived as a risk of expropriation of minority investors. This is because the little interaction of organizations with the market, through the payment of volatile levels of dividends, limits the ability of investors to assess the

appropriate levels of dividends to be demanded as a way to force the reduction of the level of free cash flow available to managers (Jensen; 1986; La Porta *et al.*, 2000a; Michaely & Roberts, 2012).

This statement is based on the proposition that environments of weak legal protection and less exposure of companies to the discipline of the capital market give scope for controlling and active investors, such as executives or board members, to influence the dividend policy so as not to allow the market to demand dividend levels that reduce the free cash flow available to management and thereby minimize the private control benefits.

In addition, the interactions of earnings and shareholders' equity with the speed of adjustment of dividends were significant at the levels of 1% and 5%, respectively, indicating that the variables representing the accounting information prove to be relevant when combined with the dividend smoothing.

For the first interaction (Lpa*Ci), a positive relationship with the stock price was observed, indicating that the greater the speed of adjustment of dividends, the greater the relevance of earnings. This result makes it possible to infer that the earnings is relevant because it allows forecasts of the payment of high levels of dividends. That is, from the observation that organizations do not follow conservative dividend payment policies (due to the little dividend smoothing), if there are earnings, there is a tendency for it to be quickly incorporated into the level of dividend payment.

The second interaction (Plpa*Ci) proved to be negatively related to the stock price; that is, the greater the variations in the speed of adjustment of dividends and shareholders' equity, the lower the stock price must be. This finding differs from the prediction that shareholders' equity is positively related to stock price. A possible explanation for this observation is that increases in shareholders' equity, for the Brazilian market, initially come from retention and reinvestment of earnings (Gonçalves *et al.*, 2018).

In this sense, the negative relationship between the interaction of shareholders' equity and the speed of adjustment of dividends indicates that investors perceive this relationship as a form of expropriation. This is because the reinvestment of earnings would be understood as incapable of returning the cost of equity to investors, that is, the benefits from dividends paid in the current period would be perceived as superior to future dividends and capital gains that can be generated by opportunities investments resulting from the reinvestment of earnings.

In view of the aforementioned relationships, it is possible to conclude that the dividend smoothing has incremental power over the relevance of accounting information; that is, the dividend smoothing makes the accounting information on earnings and shareholders' equity more relevant, changing the magnitude of the coefficients of these variables. These results corroborate the outcome model of smoothing dividends on the relevance of accounting information.

Based on this evidence and in response to the problem of this research - what is the effect of smoothing dividends on the relevance of accounting information in Brazil? -, it is possible to answer that, in circumstances of little dividend smoothing, accounting information can be used as a monitoring mechanism for minority investors, assisting in a more effective monitoring in terms of reducing expropriation risks through the policy of dividends.

The observation of these results corroborates the statement by La Porta *et al.* (2000a) that in market environments with a code law legal regime due to the information asymmetry resulting from the low level of legal protection resulting from the incipient corporate governance environment and its idiosyncrasies, there is a tendency for misallocation of resources. At this point, because of their aversion to the risk of expropriation, minority investors would tend to demand as much dividends as possible, regardless of investment opportunities, as a way of imposing discipline on controlling investors.

It is possible to advocate, therefore, in favor of the relevance of dividends, corroborating the hypothesis of Gordon (1959) that investors prefer high current levels of dividends (bird in hand) than the expectation of future dividends (bird in the bush), above all in environments that favor the managerial opportunism of controlling investors.

4.3 Robustness Analysis

The estimation results of the Collins *et al.* (1997) in their original and adapted specifications presented in Tables 1 and 2 were robustly estimated for heteroscedasticity, given the verification using the White test, at the significance level of 5% and heteroscedastic residues.

No multicollinearity problems were found, given the variance inflation factor test, which did not indicate multicollinearity problems between variables, given the observation of factors with values less than 10.

Finally, the Shapiro Wilk test for residual normality was performed, a hypothesis that was rejected for a significance level of 5%. The rejection of the hypothesis of normality of the residuals may imply bias in the estimates of the "t" and "F" statistics, thus distorting the inferences made.

Generally, the lack of normality of the residuals is relaxed due to the operation of large samples, arguing, due to the central limit theorem, that a sufficiently large number of observations results in "t" and "F" statistics very close to the normal distribution values. Some econometricians argue that a number of observations equal to or greater than 30 is sufficient to relax the assumption of normality. However, Wooldridge (2011) comments that this value may not be sufficient for all possible distributions of the error term.

The observation of this problem may be due to the heterogeneity of the data. Thus, in view of the observation of this problem, a sensitivity analysis of the variables of interest in the model adapted from Collins *et al.* (1997) using quantile regression analysis. The quantile estimation technique was originally developed by Koenker & Bassett (1978), consisting of a robust semiparametric method for the presence of outliers, non-normal distributions and heteroscedastic residues. In essence, the quantile regression technique estimates the parameters of the model analyzed from the median of the quantiles, which makes the analysis robust to problems derived from extreme values and biased averages.

The quantile regression model, according to Koenker & Bassett (1978), is written as $Q(Y \mid x) = x'\beta(\tau)$, in which $\beta(\tau)$ in which it is the set of coefficients of the variables to be estimated, in which the estimates $\hat{\beta}(\tau)$ minimizes $min_{\beta \in Rm} \sum_{i=1}^{n} \rho_t (y_i - x'\beta)$.

The model adapted from Collins *et al.* (1997) was estimated using the quantile regression technique and graphs of the parameters were plotted for the independent variables.

As a result, all parameters had behavior similar to that estimated by the method of ordinary least squares (OLS), except for the parameter of interaction between Lpa*Ci, shown in Figure 1.

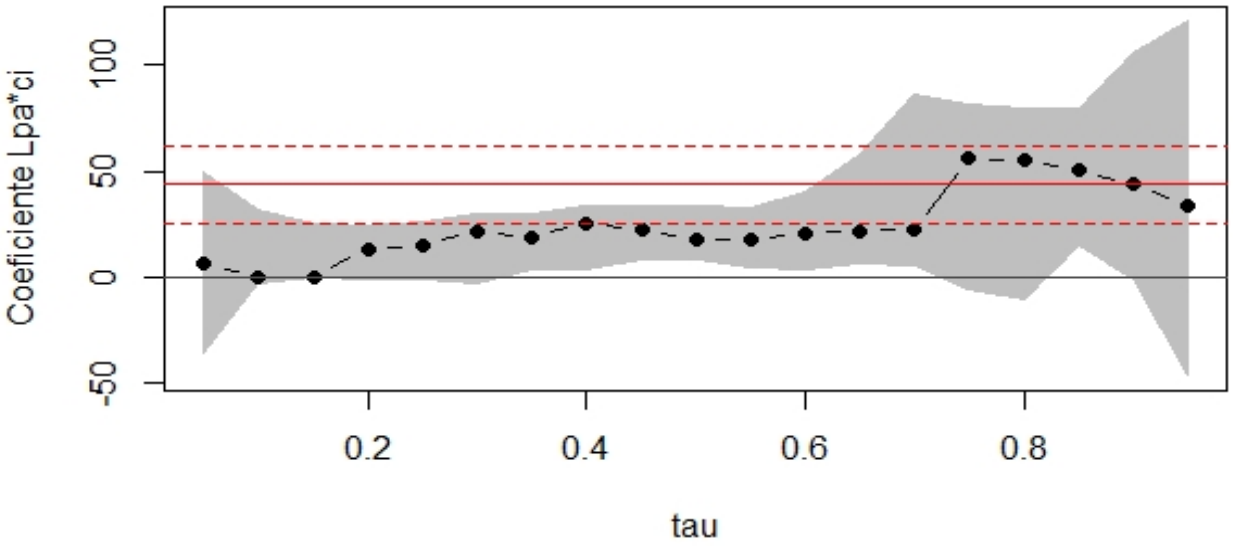

Figure 1. Quantile Distribution of the Coefficient Lpa*Ci
Source: Research data.

Figure 1 shows on the ordinate axis the magnitude of the estimated coefficient for the interaction Lpa*Ci and, on the abscissa axis, the quantile of the distribution, represented by the Greek letter tau (τ). The dotted lines and the solid line, both in red, represent, respectively, the confidence interval and the coefficient of interaction Lpa*Ci by the OLS. The black dotted line represents the behavior of the Lpa*Ci interaction coefficients estimated over the quantiles, and the gray shading is the confidence interval.

With respect to that presented in Figure 1, it is possible to observe the positive sign of the Lpa*Ci interaction, confirming that the greater the product of the Lpa*Ci interaction, the higher the stock price tends to be.

However, the estimation performed by the quantile regression analysis technique, despite confirming the result (positive sign) for the coefficient estimated from the interaction Lpa*Ci, shows that the coefficients are lower than those estimated by ordinary least squares. This observation is valid for all quantiles below the 0.70 quantile, whereas for the other quantiles, the OLS and quantile estimates are similar. In this way, it is possible to conclude that the Lpa*Ci interaction has a positive effect on the stock price, although slightly less than that observed by the OLS estimation.

5 CONCLUSION

This work analyzed the effects of smoothing dividends on the relevance of accounting information. Following this purpose, the outcome and substitution models were tested. The analysis of the aforementioned effects occurred from the inclusion of the speed of adjustment (c_i), as a proxy for the dividend smoothing, in the relevance model of the accounting information of Collins *et al.* (1997).

To achieve the research objective, initially, the adjustment speed (c_i) was obtained from the individual estimation (by company) of the Lintner's partial adjustment model (1956), which indicated an average of 0.6245 for this variable, showing that in Brazil there is a rapid incorporation of earnings at the level of dividends paid (little smoothing).

Subsequently, the speed of adjustment (c_i) was included in the accounting information relevance model of Collins *et al.* (1997) and it was found that the dividend smoothing increases

the explanatory power of accounting information on earnings and shareholders' equity. There was a positive sign for earnings and a negative sign for shareholders' equity, indicating that, due to the dividend smoothing, there is a greater propensity to incorporate earnings at the level of dividends to the detriment of their reinvestment; and, that these factors are reflected in the stock price.

In theoretical terms, these results converge to accept the outcome model, which allows us to infer that in market environments with little protection for minority shareholders, as is the case in Brazil, the consideration of dividend smoothing in the analysis of the relevance of accounting information is perceived as a monitoring mechanism.

Thus, from the evidence presented in this research, it is possible to suggest that there are indications that the observed relationships can be derived from the incipient corporate governance environment and its idiosyncrasies, according to the theoretical predictions launched by La Porta *et al.* (2000a) and that, as a result, minority investors tend to demand as much dividends as possible, thus resulting in less dividend smoothing.

As suggestions for future research, it is recommended to study the effects of smoothing dividends on other proxies of quality of accounting information, as well as investigating their possible determinants.

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