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Executive variable compensation, earnings management, and analysts' coverage; Empirical evidence in an emerging market

Compensación variable ejecutiva, gestión de resultados y cobertura de analistas; evidencia empírica en un mercado emergente

Dante Baiardo Cavalcante Viana Jr.[1*], Igor Teodósio[2], Karoline Sobreira[2], Vera Ponte[2]

[1]Universidade do Algarve, Portugal
[2]Federal University of Ceara, Brazil

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Abstract

This study aims to analyze the moderating effect of analyst coverage on the relationship between executive variable compensation (i.e., profit-sharing and share-based compensation) and earnings management practices in an emerging market. The analyses are based on a sample of Brazilian-listed firms covering the years between 2010 and 2023. We consider the absolute amount of discretionary accruals as a proxy for earnings management. Analyst coverage is measured by the number of analysts who follow the firms, while the executive variable compensation is estimated by hand-collected data related to the percentage of remuneration for both profit-sharing and share-based compensation. The results suggest that only variable compensation incentives for profit-sharing can induce managers to adopt higher levels of earnings management; we find no evidence taking into account share-based compensation. Moreover, our results also reveal that the coverage of financial analysts does not play a role in this relationship, not influencing the effect of variable compensation on earnings management in the Brazilian capital market. The results complement previous literature on earnings quality and executive compensation in emerging markets by disentangling the executive variable compensation in two different incentives (i.e., short-term and long-term incentives) – offering a larger picture of the association between the two constructs.

*Corresponding author.
E-mail address: dantebcviana@gmail.com (D. B. C. Viana, Jr.).
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Resumen

Este estudio tiene como objetivo analizar el efecto moderador de la cobertura de analistas en la relación entre la compensación variable de los ejecutivos (es decir, participación en las utilidades y compensación basada en acciones) y las prácticas de gestión de resultados en un mercado emergente. Los análisis se basan en una muestra de empresas cotizadas en Brasil que abarca los años entre 2010 y 2023. Consideramos el monto absoluto de los devengos discrecionales como una medida proxy de la gestión de resultados. La cobertura de analistas se mide por el número de analistas que siguen a las empresas, mientras que la compensación variable de los ejecutivos se estima a partir de datos recolectados manualmente sobre el porcentaje de remuneración correspondiente tanto a la participación en las utilidades como a la compensación basada en acciones. Los resultados sugieren que solo los incentivos de compensación variable relacionados con la participación en las utilidades inducen a los directivos a adoptar niveles más altos de gestión de resultados; no se encuentra evidencia similar en relación con la compensación basada en acciones. Además, los resultados revelan que la cobertura de analistas financieros no desempeña un papel en esta relación, ya que no influye en el efecto de la compensación variable sobre la gestión de resultados en el mercado de capitales brasileño. Estos hallazgos complementan la literatura previa sobre calidad de la información contable y compensación ejecutiva en mercados emergentes, al desagregar la compensación variable en dos tipos de incentivos (es decir, incentivos de corto y largo plazo), ofreciendo así una visión más amplia de la asociación entre estas dos dimensiones.

Código JEL: M41, G14, G15
Palabras clave: cobertura de analistas; remuneración ejecutiva; gestión de resultados; Brasil

Introduction

The Agency Theory argues that different agents related to the firm have divergent interests, causing agency conflicts (Jensen and Meckling, 1976). Therefore, there is a need to adopt corporate governance mechanisms to minimize these problems and align interests. Among these instruments, executive variable compensation stands out (Beuren et al., 2020), since, according to Goergen and Renneboog (2011), executive compensation linked to firm performance is one of the main alternatives to mitigate agent conflicts. However, although variable compensation is a relevant instrument of corporate governance when linked to accounting-based performance, variable compensation can have the opposite effect: encourage managers to adopt opportunistic practices to manipulate earnings to achieve established goals and obtain personal gains (Assense-Okofo et al., 2021; Buchholz et al., 2020), by using earnings management strategies.

Accounting information measurement and disclosure criteria enable managers to adopt certain practices to manage accounting information (Dechow et al., 2010), especially in more fragile institutional environments. Thus, variable compensation incentives can affect the behavior of managers (Gouldman

and Victoravich, 2020), given that executives can adopt accounting choices that allow them to obtain more advantages (Moardi et al., 2019), because of the impacts reflected in their remuneration (Feng and Jia, 2021).

In this context, in which internal control mechanisms (such as executive compensation incentives) are insufficient to contain managerial opportunism and protect the rights of shareholders, Walsh and Seward (1990) alert to the need to incorporate external governance mechanisms. Among these, there is the monitoring of financial analysts which is a mechanism with characteristics that are different from the usual governance instruments (Degeorge et al., 2013). Analysts have privileged access to the firm's management, which allows them to be effective monitors of the managers' performance, as well as seek to ensure more accurate forecasts of the earnings reported to investors (Chen et al., 2015; Li et al., 2021; Thesing and Velte, 2021). From this perspective, therefore, analysts' coverage may dampen the incentives for managers to engage in earnings management.

Taking those arguments into account, and considering that executive variable compensation linked to accounting-based performance can encourage top management to engage in earnings manipulation to achieve their interests (Buchholz et al., 2020); and that the monitoring of analysts can mitigate managerial opportunism regarding earnings management practices (Degeorge et al., 2013), this study aims to analyze the moderating effect of analyst coverage on the relationship between executive variable compensation and earnings management.

We base our analysis on 413 firm-year observations of Brazilian-listed firms between 2010 and 2023. We consider the absolute amount of discretionary accruals as a proxy for earnings management. Analyst coverage is measured by the number of analysts who follow the firm, while the executive variable compensation is estimated by the percentage of remuneration for both profit-sharing and share-based compensation. Controlling for a bunch of firm-level characteristics, we find that variable compensation incentives exclusively related to profit-sharing seem to induce managers to adopt higher levels of earnings management; we find no evidence taking into account share-based compensation. Moreover, our results also reveal that the coverage of financial analysts does not play a role in this relationship, not influencing the effect of variable compensation on earnings management in the Brazilian capital market. Our results are robust to a battery of sensitivity tests.

This research contributes to the previous literature in the following ways. First, the study enriches the literature on earnings management determinants in emerging markets, such as Brazil, where managers have strong incentives to engage in earnings manipulation, due to economic instabilities that affect organizations (Santana et al., 2019) and weak institutional environment (Moura et al., 2020). Applying regulations in countries with less developed economies may not be enough to guarantee investor protection (Ke and Zhang, 2020) and contain managers' propensity to manipulate earnings (Song and

Tuoriniemi, 2016). In this scenario, other mechanisms, such as monitoring analysts, may even be more effective, minimizing the level of earnings management (Okyere et al., 2021) and contributing to the dissemination of better information quality (Shiah-Hou, 2016). Our study contributes to such debate and the discussion related to the assumptions of the Agency Theory, as it identifies how different mechanisms of corporate governance can impact the level of earnings management, thus influencing agency costs related to monitoring managers.

Second, by disentangling the executive variable compensation in two different incentives (i.e., short-term and long-term incentives), we complement previous literature on both earnings quality and executive compensation by offering a larger picture on the association between the two constructs. Finally, we also contribute specifically to executive compensation literature in emerging markets. The relationship between executive compensation and earnings management has been addressed in several perspectives in the literature (i.e., Assensso-Okofo et al., 2021; Harris et al., 2019; Park, 2019; Thesing and Velte, 2021). In emerging markets, compensation works as one of the main incentives for earnings management (Habbash and Alghamdi, 2015). However, Alhebri et al. (2021) state that, in the case of family businesses, this effect can be the opposite. Managers' remuneration can work as a mechanism capable of reducing the level of manipulation of earnings. Moreover, according to Abdelaziz et al. (2020), executive compensation can also limit the manipulation of accounting amounts depending on the firm's corporate governance quality. Thus, studies that address the relationship between executive compensation and earnings management bring inconclusive results. For this reason, we contribute to the literature by identifying the specific effect of executive variable compensation on earnings management and investigating the moderating effect of monitoring analysts on this relationship.

Background and hypotheses

Business relationships can be marked by agency conflicts, as the interests of managers and shareholders or majority and minority shareholders may diverge (Jensen and Meckling, 1976). It is at this core that Jensen and Meckling (1976) model the presuppositions of the agency theory, which, according to Eisenhardt (1989), aims to solve the agency problem that arises when the objectives of the principal and the agent come into conflict, implying possible opportunistic actions by the managers.

In this process, information asymmetries can occur (Eisenhardt, 1989), and managers can be encouraged to engage in earnings management strategies in order to produce financial reports that provide a positive description of the business activities and financial position of the firm in order to maximize their own utility (Harris et al., 2019). The practice is intensified in situations where executive variable compensation is calculated based on reported earnings (Gutiérrez et al., 2020).

To solve this agency problem, the literature points out the importance of governance mechanisms, which can reduce the divergence of interests between managers and shareholders and, therefore, limit the manipulation of accounting amounts, improving the quality of financial reports (Mardnly et al., 2021). An important mechanism in such discussion is the board of directors, as it is responsible for protecting the rights of shareholders by overseeing financial disclosures and improving corporate performance (Almutairi and Quttainah, 2020), thus reducing the risk of earnings management. It is in this context that Saona et al. (2020), for instance, examine how board characteristics determine the opportunistic managerial behavior exemplified in earnings management and provide evidence that larger boards supervise managers more efficiently, thus restricting their ability to manage earnings.

On the other hand, executive directors may be encouraged to manipulate earnings (Makarem and Roberts, 2020). The executive board has attributes that ensure an important influence on the firms' decisions (Pucheta-Martínez and Gallego-Álvarez, 2021) – among them, the preparation and disclosure of accounting information. Therefore, managers can adopt accounting choices to obtain more advantages (Moardi et al., 2019), such as increasing personal wealth (Park, 2019) when salary incentives are linked to achieving earnings goals. Thus, due to the agency issue that involves remuneration and alignment, executives can manipulate the reported earnings to achieve the goal established by the shareholders (Kontesa et al., 2021). For this reason, executive compensation is identified as one of the main motivations for earnings management, especially in less developed economies (Habbash and Alghamdi, 2015).

From the above, the literature argues that, in a scenario of high incentives, the board tends to undertake a greater level of earnings management activities (Harris et al., 2019), in which managers can use firm resources and engage in activities to extract benefits at the expense of shareholders (Tosun, 2020). In this way, directors choose to manipulate financial reports to report better earnings performance (Feng and Jia, 2021). Thus, the relationship between executive compensation and earnings management is being increasingly explored, arising the interest of academia and various stakeholders related to organizations (Dikolli et al., 2021).

Following this perspective, Park (2019) analyzes firms included in the ExecuComp database from 1997 to 2014 to investigate whether executives' compensation from similar firms affects earnings management. The author shows that executive compensation is positively associated with earnings management. Similarly, Harris et al. (2019) empirically demonstrate that directors exhibit very similar earnings management behaviors regardless of gender at higher levels of share-based compensation. Bao et al. (2021) reinforce this problem when they find that directors with higher levels of compensation may be influencing the quality of financial reports to their own benefit. Feng and Jia (2021) investigate the factors that encourage directors to prioritize good managerial information in financial reports and hence using data related to executive compensation, empirically find that executives with high salary

performance incentives tends to adopt more earnings management practices. However, even though they show positive associations between executive variable compensation and earnings manipulation, studies show that the characteristics of the board of directors can mitigate these effects (Alhebri et al., 2021) to improve the manager-shareholder alignment and reduce the problem of information asymmetry. From the above, and considering that the remuneration levels of the board may be associated with earnings management practices, the following research hypothesis emerges:

H1: The executive variable compensation is positively associated with earnings management.

Analysts have an important role in the corporate governance of organizations, as they reduce agency costs arising from monitoring managers (Jensen and Meckling, 1976). Degeorge et al. (2013) explain that analysts have characteristics that make it possible to be effective external monitors, such as knowledge to interpret accounting numbers and privileged access to firm management. In addition to contributing to the detection of corporate fraud (Yu, 2008) and acting to reduce information asymmetry between insiders and outsiders (Sun and Liu, 2016).

The literature suggests that analysts significantly influence corporate decisions (Allen et al., 2016), including earnings management practices (Yu, 2008; Degeorge et al., 2013; Cang et al., 2014). According to Rodriguez-Pérez and Hemmen (2010), managers can take advantage of the opacity of accounting information disclosed in financial statements to manipulate accounting information. However, the active participation of financial analysts in the information disclosure process can influence the decisions of managers regarding the manipulation (or not) of accounting information (Yu, 2008).

Yu (2008) explains that as analysts regularly monitor financial statements and interact directly with management on financial reporting, managers would be less motivated to adopt profit manipulation practices, as these information intermediaries help detect the misbehavior of managers. On the other hand, analyst coverage can create excessive pressure on managers to meet earnings forecasts (Cang et al., 2014) in view of the reflections on share prices in order to encourage managers to manipulate profits to meet or exceed analysts' forecasts. Thus, Cang et al. (2014) assert that, in general, analyst coverage can restrict or encourage earnings management, but that this effect depends on accounting standards, detection of earnings management practices, and the institutional context itself. Therefore, several studies have investigated the relationship between analyst monitoring and accounting earnings management.

Yu (2008) explores the relationship between financial analysts and earnings management strategies using a sample of US firms between 1998 and 2002. The study finds that companies followed by more analysts engage less in earnings management. Degeorge et al. (2013) extend this analysis to a global context, examining firms from 21 countries between 1994 and 2002. Their findings suggest that in economies with high financial development, an increase in analyst coverage leads to lower earnings management. However, this relationship does not hold in countries with weaker financial development.

Chen et al. (2015) provide further insights by showing that managers engage in more earnings management strategies after companies experience an exogenous loss of analyst coverage. Paiva et al. (2019) focus on companies listed on the London Stock Exchange between 2006 and 2010, examining earnings management in family and non-family businesses. Their results indicate that family firms tend to engage more in earnings management, but this effect diminishes when many analysts monitor them.

In less developed information environments, characterized by low investor protection, such as Brazil (Santa and Rezende, 2016; Moura et al., 2020), external mechanisms of corporate governance, such as the coverage of analysts, can play a relevant role in monitoring the actions of managers, due to the fragility of the institutional and legal environment in the country (Claessens and Yurtoglu, 2013). Thus, we expect that analyst coverage can inhibit managers' incentives to manipulate profits for personal gains, such as increased compensation linked to accounting results. Accordingly, and based on the theoretical foundation presented, the second research hypothesis is formulated:

H2: The positive relationship between the executive variable compensation and earnings management is lower in firms with high analysts' coverage.

Based on the literature presented, Figure 1 presents the theoretical model proposed in this study.

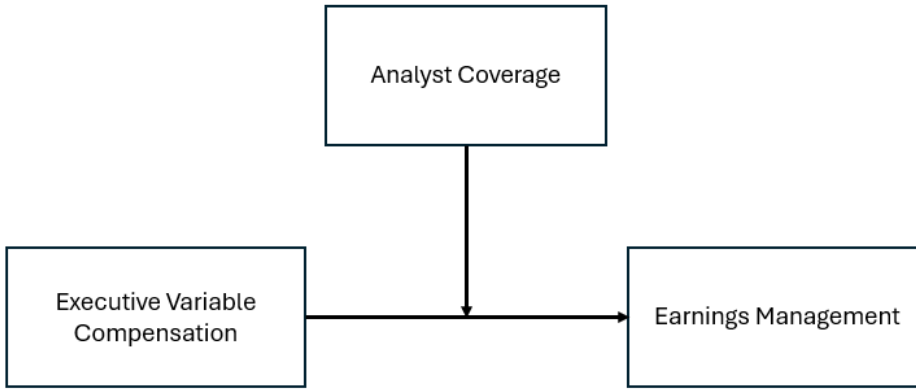

Figure 1. Theoretical model.

Research design

Sample and data

The study sample is based on Brazilian-listed firms with shares traded on the IBrX 100 in 2023. The IBrX 100 is formed by the 100 most tradable and representative stocks in the Brazilian stock market. Even though some potential variations in the IBrX100 could eventually happen, the index has not substantially changed over the years, being majority formed by large and very traditional listed firms, such as Vale, Petrobras, and Ambev.

The analysis period covers the years between 2010 and 2023. For compensation variables, both profit-sharing and share-based compensation, we use hand-collected data from the Reference Forms[1], as recommended by the Brazilian Securities Commission. We also take the number of analysts who monitor firms from the I/B/E/S database. Finally, for earnings management and other variables, we rely on the Refinitiv database. Financial (Standard Industrial Classification [SIC] from 6000 to 6999) and public utility firms (SIC from 4400 to 4999) are excluded from the analysis, as widely recommended by the earnings management literature (e.g., Kothari et al., 2005; Larson et al., 2018). Finally, after excluding observations without sufficient data to calculate the investigated variables, the final sample is formed by an unbalanced panel dataset composed of 413 firm-year observations.

Variables

We consider as the dependent variable the level of earnings management (Acc EM) measured by the absolute amount of discretionary accruals, based on the modified Jones model (Dechow et al., 1995). The return on assets is inserted as an additional regressor (ROA), as suggested by previous accruals-based earnings management literature (e.g., Kothari et al., 2005; Lara et al., 2020). Thus, we calculate abnormal accruals by estimating Equation (1) and including year- and industry-fixed effects. The absolute values of the estimated residuals from Equation (1) are our discretionary accruals measure, which represents the level of earnings management by each firm-year observation.

[1] Reference Form is an electronic document, of periodic referral, similarly to the 10-K form in the United States, regulated by the Brazilian Securities Commission, containing important information about firms such as operational activities, risk factors, managers, capital structure, financial data, issued securities, among others.

$$TA_{it} = \alpha_0 + \beta_1 \frac{1}{Ats_{it-1}} + \beta_2 \frac{(\Delta Sales_{it} - \Delta REC_{it})}{Ats_{it-1}} + \beta_3 \frac{GPPE_{it}}{Ats_{it-1}} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (1)$$

where,

$$TA_{it} = \frac{(\Delta CA_{it} - \Delta CL_{it} - \Delta CASH_{it} + \Delta STDEBT_{it} - DEP_{it})}{Ats_{it-1}} \quad (2)$$

where, for each firm i in year t, TA is the total accruals. ΔCA is the change in current assets for each firm i from year t-1 to year t. ΔCL is the change in current liabilities. ΔCASH is the change in total cash reserve. ΔSTDEBT is the change in the short-term debt. DEP is the amount of depreciation expenses. Ats is the total assets. ΔSales is the change in the revenues. ΔRec is the change in the accounts receivable. GPPE is the gross amount of property, plant, and equipment. ROA is the net income before extraordinary items scaled to total assets.

As independent variables, we consider the percentage of executive variable compensation (Comp_Variable). In this sense, two variables are considered in the analysis of variable compensation: the percentage of compensation of profit-sharing (Profit-Sharing Compensation), as well as the percentage of share-based compensation related to the total compensation of the executive directors (Share-Based Compensation). Thus, we expect to increase the proposed discussion by inferring both shorter-term variable remuneration (i.e., profit-sharing) and long-term (i.e., share-based) compensation. We hand-collect data on variable compensation in the firms' Reference Form. Finally, the number of analysts (Analysts) who monitor firms is also considered an independent variable, as such information is obtained from the I/B/E/S database.

Models

In order to investigate whether there is a positive association between variable remuneration and earnings management by accruals (H1), Equation 3 is estimated:

$$\begin{aligned} ACC\ EM_{it} = {} & \alpha_0 + \beta_1 Comp\_Variable_{it-1} + \beta_2 Size_{it} + \beta_3 Profitability_{it} + \beta_4 Debt_{it} \\ & + \beta_5 Liquidity_{it} + \beta_6 Dissue_{it} + \beta_7 Eissue_{it} + \beta_8 Litigation_{it} + \beta_9 Analysts_{it} \\ & + \sum YearFE + \sum IndustryFE + \varepsilon \end{aligned} \quad (3)$$

where, for each firm i in the year t, ACC EM is the earnings management based on discretionary accruals. $Com\_Variable_{it-1}$ is the executive variable compensation represented both by the percentage of compensation of profit-sharing (Profit-Sharing Compensation), as well as the percentage of share-based compensation concerning the total compensation of the executive directors (Share-Based Compensation) at the beginning of the year t[2]. Based on the theoretical argument presented, it is expected that the coefficient of the variable $Comp\_Variable_{it-1}$ – either captured by the percentage of compensation of profit-sharing (Profit-Sharing Compensation), as well as the percentage of share-based compensation concerning the total compensation of the executive directors (Share-Based Compensation) – to be significantly positive, suggesting a positive association between variable compensation and earnings management by accruals.

In addition to the variables mentioned, based on previous earnings management literature (e.g. Black et al., 2017; Gray et al., 2015; Lara et al., 2020; Osma, 2020; Trimble, 2018), we additionally consider a vector of control variables in our estimations. Table 1 presents the control variables and their definitions.

Table 1
Variable's definition.

Dependent Variable	
Acc EM	is the accruals-based earnings management based on the modified Jones model (Dechow et al., 1995). The return on assets is inserted as an additional regressor, as suggested by previous accruals-based earnings management literature (e.g., Kothari et al., 2005; Lara et al., 2020).
Independent Variables	
Analysts	is the number of analysts.
Profit-Sharing Compensation$_{t-1}$	is the percentage of total executive variable compensation related to profit-sharing amounts.
Share-Based Compensation$_{t-1}$	is the percentage of total executive variable compensation related to share-based amounts.
Control Variables	
Size	is the natural logarithm of market capitalization.
Profitability	is the ratio between net income and total assets.
Debt	is the short-term debt scaled by total assets.
Liquidity	is the ratio between current assets and current liabilities.
Dissue	is the percentage of total liability growth from period t-1 to t.
Eissue	is the percentage of total equity growth from period t-1 to t.

[2] Following Bergstresser and Philippon (2006), we lag the executive compensation variable by one period (*t*-1). This approach ensures that the compensation structure is measured prior to earnings management, thereby reinforcing the direction from compensation to earnings management. By using lagged compensation, we also mitigate the risk of reverse causality and better capture the incentive effect of compensation on managerial behavior in the subsequent period.

Litigation	is a dummy variable that assumes the value 1 for firms from industries with a high probability of litigation (i.e., SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370) and zero otherwise.
Robustness Test Variables	
EM_a1	is the accruals-based earnings management based on the modified Jones model (Dechow et al., 1995), without any additional control variables.
EM_a2	is the accruals-based earnings management based on the modified Jones model (Dechow et al., 1995), and additionally including lagged accruals (Dechow et al., 2012).
EM_a3	is the accruals-based earnings management, based on the modified Jones model (Dechow et al., 1995), and additionally including the firm's performance as well as the percentage of net revenue growth of firms based on Larson et al. (2018) and Lara et al. (2020).

Furthermore, in order to investigate whether the positive association between variable compensation and earnings management by accruals is lower in firms with higher coverage of analysts (H2), Equation 4 is estimated as follow:

$$\begin{aligned} ACC\ EM_{it} = {} & \alpha_0 + \beta_1 Comp\_Variable_{it-1} + \beta_2 Comp\_Variable_{it-1}\ x\ Analysts_{it} \\ & + \beta_3 Size_{it} + \beta_4 Profitability_{it} + \beta_5 Debt_{it} + \beta_6 Liquidity_{it} \\ & + \beta_7 Dissue_{it} + \beta_8 Eissue_{it} + \beta_9 Litigation_{it} \\ & + \beta_{10} Analysts_{it} + \sum YearFE + \sum IndustryFE + \varepsilon \end{aligned} \quad (4)$$

where for each company i in year t, Analysts is the number of analysts who follow the companies. All other variables as mentioned previously. We expect that the variable $Comp\_Variable_{it-1}$ to be significantly positive, and that the interaction term $Comp\_Variable_{it-1}$ x Analysts to be significantly negative, suggesting that greater coverage of analysts dampens the positive association between variable remuneration and earnings management by accruals.

Equations 3 and 4 are estimated using the method of ordinary least squares (OLS), by considering both industry- and year-fixed effects. To adjust for possible cross-sectional and serial correlations, standard errors are adjusted by clusters at the firm-level (Petersen, 2009). All continuous variables are winsorized between 1% and 99%. Finally, we also follow Chen et al. (2018) instructions regarding potential problems of biased coefficients and standard errors that can lead to incorrect inferences, both with Type I and Type II errors, in the traditional accrual estimation process. Specifically,

all independent variables from Equation 1 are included as a control variable in both Equations (3) and (4). However, the results are robust without this adjustment.

Results

Descriptive analysis

Table 2 presents the descriptive analysis of the dependent and independent variables. The results demonstrate that the level of discretionary accruals (Acc EM) is, on average, 0.0690, indicating that Brazilian firms have been using earnings management strategies to increase earnings, converging with the findings of Santana et al. (2019). Moreover, on average, the number of analysts who follow the firms in the sample is around 9, a value lower than that found by Novaes et al. (2018) (11.70). Fan et al. (2021) explain that the high coverage of analysts helps in the effective monitoring carried out by the board of directors to minimize the initiatives of manipulation of earnings, thus functioning as an important external mechanism of corporate governance. We also note that the variable compensation for profit-sharing (Profit-Sharing Compensation) (linked to a more short-term view) and share-based remuneration (Share-Based Compensation) (linked to a more long-term view) represent, on average, respectively, 15.51% and 18.90% of the total executive compensation of the board. Finally, we also find that around 30% of firms in the sample, on average, operate in industries with a high probability of litigation.

Table 2
Descriptives statistics.

Variables	N	Mean	p25	p50	p75	SD
Acc EM	413	0.0690	0.0203	0.0449	0.0933	0.0755
Analysts	413	8.9322	6.0000	9.0000	12.0000	4.3900
Profit-Sharing Compensation$_{t-1}$	413	0.1551	0.0000	0.0873	0.2868	0.1815
Share-Based Compensation$_{t-1}$	413	0.1890	0.0000	0.1450	0.2976	0.1905
Size	413	16.1800	15.2727	16.1221	17.0346	1.4824
Profitability	413	0.0427	0.0038	0.0314	0.0781	0.0672
Debt	413	0.0753	0.0305	0.0610	0.1040	0.0598
Liquidity	413	1.8860	1.2217	1.6405	2.3126	0.9486
Dissue	413	0.2207	-0.0007	0.1286	0.2706	0.4607
Eissue	413	0.2656	-0.0095	0.0707	0.1856	0.9085
Litigation	413	0.3051	–	–	–	–

Acc EM is the accruals-based earnings management. Analysts is the number of analysts. Profit-Sharing Compensation (Share-Based Compensation) is the percentage of total executive variable compensation related to profit-sharing (share-based) amounts. Size is the natural logarithm of total assets. Profitability is the ratio between net income and total assets. Debt is the short-term debt scaled by total assets. Dissue is the percentage of total liability growth from period t-1 to t. Eissue is the percentage of total equity growth from period t-1 to t. Litigation is a dummy variable which assumes the value 1 for firms from industries with a high probability of litigation (i.e., SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961 and 7370), and zero otherwise.

Table 3 shows the correlation analysis of the variables included in Equations (3) e (4). We find that Acc EM is positively correlated with both Profit-Sharing Compensation and Share-Based Compensation, while negatively correlated with Analysts. Even though this is consistent with our predictions, those correlations are not statistically significant, at least at conventional levels (i.e., p-value > 0.10). Moreover, we also find that Acc EM is positive (negative) and significantly correlated with Liquidity, Dissue, Eissue and Litigation (Size). Those findings suggest the relevance of controlling those variables in our estimates. In addition, we note that remuneration for profit sharing and remuneration based on shares are positively correlated with firm size. Finally, it is also observed that the highest absolute correlation between the research variables is approximately -37% (liquidity and debt), which mitigates possible multicollinearity problems in the analyses performed.

Table 3
Correlation matrix.

		1.	2.	3.	4.	5.
1.	Acc EM					
2.	Analysts	-0.0255				
3.	Profit-Sharing Compensation$_{t-1}$	0.0061	0.1550			
4.	Share-Based Compensation$_{t-1}$	0.0019	0.0776	-0.1286**		
5.	Size	-0.1504***	0.1635***	0.1494**	0.1337***	
6.	Profitability	0.0304	0.1698*	0.0388	0.0909*	0.2208***
7.	Debt	-0.0106	-0.0951	0.1925***	-0.0059	-0.2524***
8.	Liquidity	0.2026***	-0.0194	-0.2696***	-0.1451***	-0.2678***
9.	Dissue	0.2514***	0.0180	-0.0328	0.1033**	-0.0034
10.	Eissue	0.2233***	-0.0732	0.0072	0.0059	0.0307
11.	Litigation	0.1108**	-0.1289**	0.0819*	0.0708	-0.1425**
		6.	7.	8.	9.	10.
7.	Debt	-0.1931***				
8.	Liquidity	0.1768***	-0.3773***			
9.	Dissue	0.1452***	-0.0612	-0.0260		
10.	Eissue	0.2208***	0.0443	-0.0783	0.2526***	
11.	Litigation	-0.0675	0.2355***	-0.1946***	-0.0339	0.0526

Acc EM is the accruals-based earnings management. Analysts is the number of analysts. Profit-Sharing Compensation (Share-Based Compensation) is the percentage of total executive variable compensation related to profit-sharing (share-based) amounts. Size is the natural logarithm of total assets. Profitability is the ratio between net income and total assets. Debt is the short-term debt scaled by total assets. Dissue is the percentage of total liability growth from period t-1 to t. Eissue is the percentage of total equity growth from period t-1 to t. Litigation is a dummy variable which assumes the value 1 for firms from industries with a high probability of litigation (i.e., SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961 and 7370), and zero otherwise.

Regression analysis

Table 4 presents the estimates of Equations (3) and (4) in order to test the association between the executive variable compensation and earnings management, as well as the moderating effect of analyst coverage on this relationship, respectively. The F-test demonstrates that the model is well-adjusted by confirming its overall statistical significance, indicating that the independent variables collectively explain a significant portion of the variation in the dependent variable. Additionally, the mean Variance Inflation Factor (VIF) reported in each estimate mitigates concerns about potential multicollinearity issues. The main results of the estimates consistently indicate a positive and significant coefficient between variable compensation based on the percentage of compensation of profit-sharing (Profit-Sharing Compensation$_{t-1}$) and earnings management by accruals. This result suggests that short-term variable compensation incentives (i.e., profit-sharing) can possibly lead executives to engage in accruals-based earnings management to achieve performance goals and then personal gains. Those findings align with Park (2019) and Bao et al. (2021).

However, no significant relationship is identified between long-term variable compensation (Share-Based Compensation$_{t-1}$) and earnings management. Wang and Xiao (2011) explain that in environments with a high concentration of ownership and that the fundamental agency problem is Type II (external investors and controlling shareholders), as in the Brazilian corporate environment, business performance may not be decisive for the payment of share-based compensation; which, in a way, would not induce managers to adopt earnings manipulation practices to obtain this type of remuneration.

Table 4
Executive variable compensation, earnings management, and analysts' coverage.

	Acc EM					
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.052**	-0.146	-0.154	0.060**	-0.139	-0.141
	(2.49)	(-1.49)	(-1.55)	(3.07)	(-1.34)	(-1.37)
Profit-Sharing Compensation$_{t-1}$	0.046**	0.054**	0.084**	–	–	–
	(2.05)	(2.44)	(2.51)			
Profit-Sharing Compensation$_{t-1}$ x Analysts	–	–	-0.003	–	–	–
			(-0.91)			
Share-Based Compensation$_{t-1}$	–	–		-0.000	-0.006	0.001
				(-0.01)	(-0.19)	(0.01)
Share-Based Compensation$_{t-1}$ x Analysts	–	–	–	–	–	-0.001
						(-0.18)
Analysts	–	0.000	0.000	–	0.000	0.000

		(0.04)	(0.38)		(0.37)	(0.41)
Size	–	0.009*	0.009*	–	0.008*	0.009*
		(1.63)	(1.67)		(1.52)	(1.53)
Profitability	–	0.415*	0.414	–	0.415	0.414
		(1.59)	(1.58)		(1.50)	(1.49)
Debt	–	0.107	0.106	–	0.135	0.133
		(1.29)	(1.30)		(1.61)	(1.58)
Liquidity	–	0.029**	0.029**	–	0.028**	0.028**
		(3.35)	(3.35)		(3.15)	(3.14)
Dissue	–	0.028*	0.028*	–	0.029*	0.029*
		(1.92)	(1.91)		(1.93)	(1.92)
Eissue	–	0.010*	0.011*	–	0.011*	0.011*
		(1.79)	(1.79)		(1.81)	(1.82)
Litigation	–	0.023*	0.023*	–	0.024**	0.024**
		(1.85)	(1.89)		(2.15)	(2.25)
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Chen's et al. (2018) correction	Yes	Yes	Yes	Yes	Yes	Yes
Clustering Firm-Level	Yes	Yes	Yes	Yes	Yes	Yes
Test F	3.77***	8.15***	9.14***	2.64***	8.44***	8.35***
VIF Mean	2.01	3.23	3.55	2.02	3.27	3.55
Observations	413	413	413	413	413	413
R-squared	0.1405	0.2734	0.2744	0.1307	0.2609	0.2610

Acc EM is the accruals-based earnings management. Analysts is the number of analysts. Profit-Sharing Compensation (Share-Based Compensation) is the percentage of total executive variable compensation related to profit-sharing (share-based) amounts. Size is the natural logarithm of total assets. Profitability is the ratio between net income and total assets. Debt is the short-term debt scaled by total assets. Dissue is the percentage of total liability growth from period t-1 to t. Eissue is the percentage of total equity growth from period t-1 to t. Litigation is a dummy variable which assumes the value 1 for firms from industries with a high probability of litigation (i.e., SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961 and 7370), and zero otherwise. The t-statistics are in parentheses and are calculated using robust standard errors. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

We also find that the interaction term between the variable compensation for profit-sharing and the coverage of analysts (Profit-Sharing Compensation$_{t-1}$ x Analysts) even though it presents a negative coefficient, is not statistically significant at conventional levels. Those results suggest that monitoring analysts does not play any role in the relationship between short-term remuneration incentives and earnings management by accruals. Moreover, we also identify that the coefficient of the interaction term between share-based compensation and the coverage of analysts (Shared-Based Compensation$_{t-1}$ x Analysts) is not significant at conventional levels, suggesting that the monitoring of analysts does not

moderate the relationship between long-term remuneration incentives and earnings management by accruals.

Previous studies suggest that when firms are monitored by financial analysts, senior management faces greater external scrutiny. As a result, managers are less motivated to engage in earnings manipulation strategies to increase their variable compensation. In this context, analyst coverage appears to deter managerial opportunism driven by earnings management for personal gain (e.g., Yu, 2008; Sun, 2018; Paiva et al., 2019). However, this moderating effect of analysts does not seem to occur in the Brazilian capital market.

In fact, the Brazilian capital market is more concentrated, with many firms controlled by founding families or a small group of shareholders (e.g., Viana et al., 2019). These controlling shareholders may exert significant influence over financial disclosures and governance, reducing the impact of external monitoring by analysts. Moreover, in emerging markets like Brazil, the institutional environment may foster different corporate behaviors (Lourenço et al., 2018). For example, a greater tolerance for earnings management or a stronger emphasis on personal relationships in business may reduce the perceived importance of analyst scrutiny. Those factors combined could explain, at least in part, the non-significant role of analyst coverage to dampen the potential association between variable compensation and earnings management. Therefore, our empirical findings confirm our prediction regarding a positive association between variable compensation and earnings management (H1 is not rejected) – even though regarding only profit-sharing compensation. However, our results do not confirm that this relationship is lower with the coverage of financial analysts (H2 is rejected).

Finally, regarding control variables, our empirical findings suggest that managers of larger firms (Size), those with higher debt issuance (Dissue) and equity growth (Eissue), as well as firms with greater liquidity (Liquidity) and operating in industries with high litigation risk (Litigation), tend to receive higher levels of variable executive compensation. This includes both profit-sharing and share-based incentives, indicating that these factors may play a significant role in shaping executive pay structures.

To assess the robustness of our findings, we conduct sensitivity tests using three alternative models for estimating discretionary accruals. Specifically, we estimate discretionary accruals using: (i) the modified Jones model (Dechow et al., 1995) without additional control variables (EM_a1); (ii) the modified Jones model (Dechow et al., 1995) with the inclusion of lagged accruals, following Dechow et al. (2012) (EM_a2); and (iii) the modified Jones model (Dechow et al., 1995) supplemented with the firm's performance and net revenue growth percentage, as proposed by Larson et al. (2018) and Lara et al. (2020), respectively (EM_a3). The results of these robustness tests are presented in Table 5.

Table 5
Robustness tests.

	EM_a1	EM_a2	EM_a3	EM_a1	EM_a2	EM_a3
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.142	-0.152	-0.151	-0.128	-0.142	-0.141
	(-1.45)	(-1.67)	(-1.51)	(-1.27)	(-1.49)	(-1.37)
Profit-Sharing Compensation$_{t-1}$	0.084**	0.091***	0.073**	–	–	–
	(2.48)	(2.40)	(2.24)			
Profit-Sharing Compensation$_{t-1}$ x Analysts	-0.004	-0.004	-0.002	–	–	–
	(-0.94)	(-0.91)	(-0.64)			
Share-Based Compensation$_{t-1}$	–	–	–	-0.002	-0.006	0.008
				(-0.04)	(-0.11)	(0.17)
Share-Based Compensation$_{t-1}$ x Analysts	–	–	–	-0.000	-0.001	-0.001
				(-0.09)	(-0.28)	(-0.35)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Chen's et al. (2018) correction	Yes	Yes	Yes	Yes	Yes	Yes
Clustering Firm-Level	Yes	Yes	Yes	Yes	Yes	Yes
Test F	13.14***	5.05***	20.63***	8.87***	5.32***	8.43***
VIF Mean	3.55	3.54	3.55	3.55	3.54	3.55
Observations	413	411	413	413	411	413
R-squared	0.2808	0.2929	0.2742	0.2681	0.2776	0.2621

Acc EM is the accruals-based earnings management. Analysts is the number of analysts. Profit-Sharing Compensation (Share-Based Compensation) is the percentage of total executive variable compensation related to profit-sharing (share-based) amounts. Control variables as defined in Table 1. The t-statistics are in parentheses and are calculated using robust standard errors. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

The results confirm the findings of our principal analysis (see Table 4), considering that the coefficient of the variable Profit-Sharing Compensation is positive and significant in the three models, and no significant relationship is identified between share-based compensation and the level of discretionary accruals. In addition, we also confirm that the analyst's coverage does not mitigate the relationship between variable compensation for profit-sharing (short-term compensation view) and earnings management.

Taking those results together, our findings overall demonstrate that different corporate governance mechanisms can affect earnings management tactics. Thus, aspects of agency theory are reinforced in our analysis, considering that firms with more aggravating agency problems may be more exposed to opportunistic management practices, requiring the adoption of strong monitoring mechanisms to minimize these effects, alternatively to the coverage of financial analysts, as effective in mitigating

earnings manipulation practices, especially in weaker institutional environments, typically associated to emerging economies, such as in Brazil.

Conclusions

Our study investigates the moderating effect of analyst coverage on the relationship between the variable remuneration of the board and earnings management. The research sample gathers Brazilian listed firms between 2010 and 2023. The results of the estimated regression models suggest a positive and significant association between variable compensation for profit sharing and earnings management by accruals, suggesting that short-term variable compensation seems to encourage executives to adopt earnings management practices. The results also point out that financial analysts' coverage does not influence this relationship, not mitigating the impact of variable compensation on earnings management in the Brazilian capital market.

In the theoretical field, this study contributes to the literature on the determinants that can influence earnings management in organizations in emerging markets, such as Brazil. In addition, the results of this study reinforce the assumptions of the Agency Theory, as different mechanisms of corporate governance (variable compensation incentives and the coverage of financial analysts) are identified as encouraging or restricting the adoption of opportunistic strategies by managers, thus influencing agency costs related to monitoring the actions of managers regarding the quality of accounting information.

This study makes a significant contribution to the development of stock markets in emerging countries. Recognizing the fundamental role of accounting information in the smooth operation of capital markets (Healy and Palepu, 2001), the findings of this research are valuable. They shed light on how certain mechanisms can enhance the quality of financial reports and reduce opportunistic behavior by managers. These insights can prove instrumental in assisting regulators as they craft and implement public policies. These policies aim to enhance the quality of information that organizations disclose and foster a stronger governance environment, which in turn attracts investors. In addition, the results presented in this study should be of interest to investors when making decisions about investing in companies with robust governance mechanisms. The study highlights that while financial analysts can monitor top management's actions and help reduce information asymmetry in certain markets, this effect may not be realistic in the Brazilian capital market.

While our study focuses on the relationship between variable executive compensation and earnings management, it is important to acknowledge that we do not isolate variable compensation exclusively tied to the CEO, treating this dimension only at the board level. This constraint may introduce noise into the analysis, as the incentives driving individual opportunistic behavior could be diluted in the

broader dataset. Future research with more granular data could provide deeper insights into this relationship. Moreover, future studies could also be interested in exploring the extent to which firms with various ownership structures, such as family-owned, institutional, or state-owned, engage in varying degrees of earnings management. Given that institutional factors within different countries can potentially shape the nexus between compensation incentives and manipulative earnings practices, conducting cross-country comparative analyses is also encouraged.

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