
ASSOCIATION BETWEEN EARNINGS MANAGEMENT AND M&A CONDUCTED BY COMPANIES ACQUIRING B3

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ABSTRACT

Corporate earnings management (EM) is the result of discretionary actions by managers to manipulate accounting information in order to alter the perception of real economic and financial performance. In this sense, this research sought to identify evidence of EM prior to M&A in Brazilian acquiring companies listed on B3, since, in general, management influences the real performance of securities in the short term and thus manipulates the market. The data was collected from Refinitiv Eikon and EM was estimated using discretionary accruals with the Pae Model and by operating activities via the Roychowdhury Model. To this end, multiple linear regressions were used. The main results showed that acquiring companies increased the level of EM from accruals and reduced EM from real/operating activities one year before the M&A was announced. There was also an association between share price variation in the period prior to the M&A announcement, an important point for M&A operators and investors, both in terms of the influence exerted on share price variation in the capital market and the informational asymmetry of the decisions and consequences involved in the process. That said, there was evidence of conflicts of interest between business objectives and the objectives of managers, who should focus on maximizing business performance when carrying out M&As.

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ASSOCIAÇÃO ENTRE GERENCIAMENTO DE RESULTADOS E F&A REALIZADAS POR EMPRESAS ADQUIRENTES DA B3

RESUMO

O Gerenciamento de Resultados (GR) empresarial é consequência de ações discricionárias de gestores ao manipular informações contábeis de forma a alterar a percepção sobre o real desempenho econômico-financeiro. Nesse sentido, essa pesquisa buscou identificar evidências de GR anteriores às F&A em empresas brasileiras adquirentes listadas na B3, visto que, de modo geral, o gerenciamento influencia o real desempenho dos títulos no curto prazo e, assim, manipula o mercado. Os dados foram coletados na Refinitiv Eikon e o GR foi estimado por meio dos accruals discricionários com o Modelo Pae e por atividades operacionais via Modelo de Roychowdhury. Para tanto, fez-se uso de regressões lineares múltiplas. Os principais resultados apontaram evidências de que empresas adquirentes elevaram o nível de GR por accruals e reduziram o GR por atividades reais / operacionais um ano antes do anúncio da F&A. Verificou-se, também, a associação entre variação do preço das ações em período anterior ao anúncio da F&A, ponto importante para os operadores de F&A e investidores, tanto na influência exercida sobre a variação do preço das ações no mercado de capitais, quanto na assimetria informacional das decisões e consequências envolvidas no processo. Isso posto, observou-se evidências de conflitos de interesses entre os objetivos empresariais e o objetivo dos gestores, os quais deveriam focar na maximização de desempenho empresarial ao realizar F&A. Nesse sentido, esses resultados auxiliam a evidenciar parte do comportamento oportunístico de gestores diante de F&A.

Palavras-chave: Gerenciamento de Resultados. Accruals. Operacionais. F&A.

1 INTRODUCTION

In corporate finance, there is no activity more controversial than the acquisition of one company by another or the merger between two or more companies (Ross et al., 2022). Mergers and Acquisitions (M&A) are corporate restructuring strategies implemented across markets, including in emerging countries. These restructurings aim to gain a competitive advantage amid the intensification of global competition; however, they are more complex than merely acquiring equipment, as they involve antitrust laws to prevent the formation of monopolies that harm free competition (Aggarwal & Garg, 2022; Purayil & Lukose, 2021). Furthermore, M&As are seen as responses to new technologies or market conditions that demand strategic changes (Campbell et al., 2016; Kalra et al., 2013).

On the one hand, M&As are motivated by factors such as strengthening market position, improving operational efficiency, transferring knowledge, and focusing on economies of scale to create business value (Bispo et al., 2017). On the other hand, M&As are also marked by the increase in informational

asymmetries and conflicts of interest, given that managers may prioritize personal interests over corporate ones (Jensen & Meckling, 1976). These factors make M&As susceptible to errors in evaluating target companies, especially regarding the creation of value for acquiring companies (Berkovitch & Narayanan, 1993).

During the process of M&As, one company plays the leading role, and the other is the target. Studies by Heron and Lie (2002), Louis (2004), Lee et al. (2008), Tutuncu (2019), and Purayil and Lukose (2021) analyzed operations before and after M&As and found evidence of Earnings Management (EM). These authors observed that acquiring companies tend to manage earnings to increase stock prices to reduce the cost of acquiring target companies by paying for the operation with stock issuance. Thus, they issue fewer shares when the stock price is overvalued.

Within this contextual perspective, Botsari and Meeks (2008) analyzed EM through discretionary accruals two years before M&A announcements in acquiring companies in the United Kingdom. Similarly, Campa and Hajbaba (2016) analyzed U.S. companies that engaged in M&As, investigating management through operational activities three years before the announcement. Under the circumstances of EM, studies investigated the manipulation of accounting information, especially from the perspective of earnings management, characterized by the manipulation of economic and financial performance. The discussion proposed in this research follows a similar analysis to Botsari and Meeks (2008) and Hajbaba (2016), but focuses on publicly traded Brazilian companies.

Identifying possible management practices enriches the understanding that accounting choices made by companies to maximize satisfactory, though not always reliable, results can alter the informational level of performance reported to the market. This affects users' perceptions and analyses of the company (e.g., Heron & Lie, 2002; Louis, 2004; Lee et al., 2008; Tutuncu, 2019; Purayil & Lukose, 2021). These studies have demonstrated that earnings management in companies undergoing M&As remains inconclusive, as some identified a negative relationship between the two, while others found a positive relationship.

EM was defined by Healy and Wahlen (1999) as the result of discretionary actions by managers to manipulate accounting information, altering perceptions of corporate performance. In this light, further research on this topic becomes relevant to provide evidence and answers that clarify this corporate activity. Therefore, this research seeks evidence of EM in acquiring publicly traded companies on B3 that engaged in M&As. Given the variety of factors, the objective is to identify evidence of EM in periods preceding the M&A process in Brazilian companies listed on B3.

For this purpose, the estimation models for EM through operational activities by Roychowdhury and discretionary accruals by Pae were used. These techniques were applied to companies that announced M&As between 2011 and 2020. The methods developed in the studies of Botsari and Meeks (2008) and Campa and Hajbaba (2016) were adapted to investigate EM one year before the M&A announcement, considering that Erickson and Wang's (1999) conclusions identified EM in acquiring companies by overstating profits, especially in the quarter immediately preceding the M&A completion. This finding was also corroborated in the research by Botsari and Meeks (2008).

As a contribution, this research seeks to estimate EM through opportunistic and discretionary actions by managers before the M&A announcement. This understanding is relevant to the market and regulatory entities by providing evidence in the context of M&As. According to El Diri (2018), M&As are among the factors driving EM; therefore, it is important for users to understand the influence exerted on stock price variability in the capital market, as well as potential informational asymmetries that bias decisions. This discussion contributes to improving investment decision-making.

2 LITERATURE REVIEW

2.1 Mergers and Acquisitions (M&A): Motivations, Conduct and Effects

According to Singh and Montgomery (1987), once an organization decides to expand, it has two options: internal growth or M&A. A merger creates an entirely new company, whereas an acquisition retains the identity of one of the companies, typically the larger one. Healy et al. (1992) and Kalra et al. (2013) highlighted that efficiency gains and strategic rationality are among the factors affected, as they provide increased market power, operational and financial synergies, tax benefits, cost reduction, revenue growth, risk diversification, implementation of a more efficient capital structure, and greater operational and financial leverage capacity.

However, the factors affecting M&A change with the dynamics of the legal, political, economic, and social environments in which organizations operate (Kaushal, 1995). Kalra et al. (2013) emphasized that among these factors are efficiency gains and strategic rationality. According to Healy, Palepu, and Ruback (1992) and Capron and Pistre (2002), M&As are related to increased market power, the attainment of operational and financial synergies, tax benefits, cost reductions, revenue growth, risk diversification, the implementation of a more efficient capital structure, and greater leverage capacity.

Although M&As provide the aforementioned benefits, it is important to emphasize that these operations should not be regarded as a simple solution to internal problems or market threats, as there is a high degree of uncertainty and complexity involved in these processes. Nevertheless, research has shown a lack of consensus regarding the real benefits generated for shareholders, particularly concerning the diversification of operations, increases in earnings per share, and reductions in financial costs, as these are difficult to identify and measure (Camargos & Camargos, 2015).

The challenges and controversies of M&As were pointed out by Anand and Singh (2018) and Ross et al. (2022), based on agency costs, free cash flow conflicts, and managerial incentives. These challenges arise from uncertainties and obstacles that may be experienced by companies that decide to implement M&As. Seth et al. (2000) identified that managers opting for M&As may do so for purely personal objectives at the expense of optimizing resources invested by shareholders. That is, acquiring company managers, upon recognizing an error in the target company's valuation, proceed with the negotiation and confirm the indicated value, leading investors to real efficiency losses in their investments.

These losses primarily occur because managers may use discretion in accounting choices and operational cash flows (Phillips et al., 2003). Consequently, they intentionally manage results to alter the substance of transactions and the information derived from them to gain an advantage. This management aims to bias information, distract stakeholders from the company's actual economic-financial performance, and influence behaviors dependent on accounting information. This constitutes a conflict of interest between the parties (Healy & Wahlen, 1999; Schipper, 1989).

According to Kloeckner (1994), Firm Theory and the principal-agent relationship stem from Economic Theory, which is used to legitimize M&As by explaining why they occur. Thus, explanations of conflicts of interest derive from reflections within Agency Theory, which specifies that, in the case of M&As, gains may be negative because managers act in their own interest at the expense of corporate interests. Managers receive salaries, benefits, and bonuses for acquiring other companies, and this is positively correlated with company size. Therefore, as company size increases with M&As, managers are willing to pursue them even with negative net present value (Jensen & Meckling, 1976; Ross et al., 2015).

Additionally, informational asymmetry exists when acquiring managers have access to information about the target company's prospects, which external investors do not. With greater access to information, managers act opportunistically, failing to prioritize maximizing corporate results or the efficiency of contracts established between shareholders and managers. Thus, the personal interests of managers may take precedence over corporate interests (Jensen & Meckling, 1976).

2.2 Earnings Management (EM) in M&A Processes

Earnings Management (EM) is a set of managerial decisions that result in either not reporting or inadequately reporting true earnings or losses (El Diri, 2018). This author identifies several methods used in management practices: through accruals; results from operational activities; reclassification of items in financial statements; and the use of derivatives and special purpose entities. In summary, management occurs when managers exercise judgment and discretion regarding items and how results will be reported in financial statements, either to influence stakeholders' conclusions about business performance or to bias accounting information and metrics established in contracts (Healy & Wahlen, 1999).

Although the work of Ball and Brown (1968) is well-recognized in accounting and finance and does not focus on M&As, their research on the quality of accounting information is fundamental for fully understanding EM. They empirically identified the impact of announced earnings news on stock market prices. Dechow et al. (1995) investigated issues related to fraud detection, earnings predictability, and EM implications for investors and regulators. Kothari et al. (2005) proposed a method for estimating discretionary accruals, which are accounting adjustments that can be manipulated to manage reported earnings. Sloan (1996) pointed out relevant governance issues concerning EM, emphasizing that strong governance practices can help mitigate such behavior.

According to Sunder (2014), there are five forms of management used by managers: discretion in choosing accounting methods; selection of accounting principles according to immediate interests; adjustments to accounting estimates; use of transfer pricing when the company operates in multiple jurisdictions; and increasing or reducing significant economic decisions, such as advertising expenses, R&D spending, executive compensation, etc. While research shows that organizations use one or more of these forms of management, in practice, they often use several simultaneously.

The context of EM is defined within Agency Theory (Walker, 2013). Makarem et al. (2020) explained the potential for informational asymmetries in financial statements and their effects on involved parties, as well as how managers manipulate results to achieve personal interests. It should be noted that accounting information manipulation mainly occurs through accruals and accounting choices (Nardi & Nakao, 2009).

Accruals arise from the monetary difference between the accrual basis and cash basis accounting. However, this difference is merely temporary between net income and cash flow since it results from monetary (discretionary) and non-monetary (non-discretionary) elements. Non-discretionary accruals are inherent to business activities and stem from Generally Accepted Accounting Principles (GAAP). Discretionary accruals involve the freedom managers have in accounting choices under regulations, often used opportunistically to manage accounting information (Formigoni et al., 2009; Nardi & Nakao, 2009).

Nevertheless, Zhang (2015) emphasized that managers should focus more on ensuring business success, observing operational synergy between the acquirer and target, as well as increasing value creation post-M&A. According to Bao and Lewellyn (2017), the stimulus for a manager to influence EM activity may vary according to institutional forces at play and the context in which the company operates. As a behavior resulting from strategic expansion, M&A processes are of great importance for corporations, as failure in this type of investment often leads to significant financial and economic losses.

According to Erickson and Wang (1999), M&As have frequently been identified as transactions with potential for opportunistic earnings management. Zhang (2015) argued that when controllers perceive that under- or overvaluation of the corporation can contribute to business success, they have strong incentives to manipulate reported earnings before the acquisition in hopes of raising stock prices, thereby reducing the cost of acquiring the target company using the acquirer's shares.

The investigation of earnings management through accruals prior to the announcement of stock acquisitions in U.S. telecommunications companies during 1990-2006 was conducted by Lee (2008). This study used the Jones Model (1991) to estimate non-discretionary, discretionary, and total accruals based on the four quarters preceding the acquisition announcement. Results showed that companies reported higher earnings before acquisitions. Additionally, it was found that EM by acquirers led to a decrease in market stock values, as the market recognized the acquirer's EM and anticipated stock price adjustments.

Similarly, Botsari and Meeks (2008) analyzed accrual-based EM in 42 publicly traded UK companies involved in M&As between 1997 and 2001. These authors investigated whether acquirers managed reported earnings upwards in the periods before an acquisition announcement. They used the Modified Jones Model to calculate accruals from annualized data two years before the M&A announcement. The research revealed that acquirers engaged in EM to increase income in the year immediately preceding the announcement. Furthermore, they found that EM primarily focused on working capital and concluded that stock acquisitions are particularly used by overvalued acquirers, recognizing the potential for negative returns as the market corrects overvaluation. Thus, they may attempt to mitigate these negative returns by smoothing unfavorable results through EM.

In a study by Campa and Hajbaba (2016), the authors investigated whether abnormal post-acquisition returns of acquirers were also attributed to EM. They used Roychowdhury Models (2006) to calculate it through operational activities in a sample of 461 M&A processes in the U.S. between 2001 and 2011. Results showed evidence of EM through real activities, particularly in sales, and concluded that companies managed earnings upwards by manipulating sales in the year before the acquisition.

Corporate management seeks to increase accounting profits before a stock acquisition since reporting higher profits influences stock valuation. The higher the acquirer's stock price on the contract date, the fewer shares need to be issued to purchase the target company. The relationship between the acquirer's stock price and the shares issued in the transaction provides various incentives for the acquirer to try to raise stock prices before finalizing the deal (Erickson & Wang, 1999).

An M&A can significantly impact reported results by creating the appearance of earnings growth. For example, if assets are unnecessarily increased, this may reflect higher expenses for depreciation, amortization, or depletion, as well as higher costs of goods sold if inventory values are inflated. These management methods can lead investors to believe the company is worth more than its fair value (Brigham & Ehrhardt, 2016; Ross et al., 2015).

Empirically, Mendes et al. (2019) sought to identify the impact of M&A announcements on the increase in EM levels of publicly traded companies listed on B3 involved in M&A processes between 2015 and 2016. The authors calculated positive and negative discretionary accruals using the Pae Model (2005). Results showed that the M&A event impacted the intensity of EM through positive discretionary accruals. Additionally, they concluded that the greater the company's growth, measured by total assets and ROA, the lower the propensity to create positive accruals.

To examine the effect of pre-acquisition EM in private companies, Tutuncu (2019) analyzed 291 UK companies from 2004 to 2012. EM was estimated through discretionary accruals. Results demonstrated that acquisitions were preceded by profit overstatement and followed by performance deterioration. The author noted that private companies involved in acquisitions engaged less in EM and remained more profitable over time.

The impact of cross-border M&As on EM in Indian companies from 2000 to 2015 was examined by Purayil and Lukose (2021). These authors found that international M&As reduced the incentive to manipulate results through accruals. Moreover, they observed that the incentive to reduce accumulated earnings manipulation was more pronounced when M&As occurred in countries with strong corporate governance structures. These findings have implications, especially in emerging markets, by recognizing weak investor protection in underdeveloped institutional environments.

Given that managers view the M&A process as an opportune moment for EM, as evidenced by research, this study seeks to empirically examine EM in acquiring companies involved in M&A processes and investigate the effect of this process on the management practices of acquiring companies listed on B3.

3 METHODOLOGICAL PROCEDURES

To achieve the objective of this research and conduct the analyses, quarterly information was collected from the Refinitiv Eikon database for Brazilian acquiring companies listed on B3 that announced M&A processes. The companies were grouped by sectors according to the Standard Industry Classification (SIC) and the National Association of Insurance Commissioners (NAIC). The economic and financial data used for calculating EM through accruals and real activities were structured as panel data and subsequently analyzed using multiple linear regression in Stata® software, version 17.

3.1 Sample and Data Collection

The data and indicators were collected from Financial Statements for the period 2010 to 2018. The list of companies that engaged in Mergers and Acquisitions (M&As) refers to the period from 2011 to 2019. This temporal difference between the collection of financial data and the companies involved in M&As is explained by the need to use prior financial information to calculate EM and conduct the analysis for the year preceding the M&A announcement. According to Cardoso et al. (2015), there are inadequacies in accrual-based analyses for samples containing information from both before and after the adoption of the International Financial Reporting Standards (IFRS). Therefore, the sample period begins with the IFRS mandatory adoption and ends in the last year with available data at the time this research was conducted.

Financial companies and those in the electric sector were excluded from the sample due to specific regulatory and legislative requirements. According to Gunny (2010), companies operating in highly regulated sectors tend to report information that complicates the identification of management-related variables. Consequently, older records were excluded to avoid overlapping data, as recommended by Botsari and Meeks (2008).

Companies with unavailable or insufficient data were excluded, resulting in an unbalanced panel. Outliers were statistically treated using 1% winsorization at the lower and upper limits. Thus, the dataset comprises 429 observations and 44 companies distributed across 8 sectors, as shown in Table 1. Botsari and Meeks'

(2008) sample included 48 UK companies, while Campa and Hajbaba's (2016) sample had 461 U.S. companies—studies on which this research is based.

Table 1

Classification of Companies by Sectors

Sector	Quantity	Sector	Quantity	Sector	Quantity
Consumer Goods	7	Materials	7	High Technology	2
Healthcare	6	Media and Entertainment	1	Industry	9
Real Estate	6	Retail	6		

3.2 Earnings Management (EM) Model through Discretionary Accruals

To investigate whether there is evidence of EM in companies that underwent an M&A process, one of the dependent variables used was the EM proxy: discretionary accruals. It is necessary to preliminarily estimate total accruals as a measure of management. Thus, these accruals were measured using the outcome-based method with the Pae Model, which, due to the inclusion of the operational cash flow variable, improves the prediction of accruals as shown in Equation 1 (Pae, 2005):

$$TA_{it} = LL_{it} - FCO_{it} \quad (1)$$

Where:

TA_{it} : Total Accruals of Entity i in Period t ;

LL_{it} : Accounting Profit of Entity i in Period t ;

FCO_{it} : Operating Cash Flow of Entity i in Period t .

In this equation, discretionary accruals are obtained from the regression residuals (Equation 2), and the estimated values for management were used in absolute terms:

$$\frac{TA_{it}}{AT_{it-1}} = \alpha_0 + \beta_1 \left(\frac{1}{AT_{it-1}} \right) + \beta_2 \left(\frac{\Delta R_{it}}{AT_{it-1}} \right) + \beta_3 \left(\frac{PPE_{it}}{AT_{it-1}} \right) + \beta_4 \left(\frac{FCO_{it}}{AT_{it-1}} \right) + \beta_5 \left(\frac{FCO_{it-1}}{AT_{it-1}} \right) + \beta_6 \left(\frac{TA_{it-1}}{AT_{it-1}} \right) + \varepsilon_{it} \quad (2)$$

Where:

Δ : Variation.

TA_{it} : Total Accruals of Entity i in Period t , as per Equation 1;

ΔREC_{it} : Revenues of Entity i in Period $t+1$ relative to Period $t-1$;

IMB_{it} : Fixed Assets of Entity i in Period t ;

AT_{t-1} : Total Assets of Entity i in the Previous Period ($t-1$);

FCO_{it} : Operating Cash Flow of Entity i in Period t ;

FCO_{it-1} : Operating Cash Flow of Entity i in the Previous Period ($t-1$);

α , β_1 , β_2 , β_3 , β_4 , β_5 e β_6 : Regression Coefficients.

ε_{it} : Regression Error (Residuals).

3.3 Earnings Management (EM) Model through Operational Activities

The EM model through operational activities uses residuals from three regressions (REMCxo, REMProd, and REMDesp) to explain abnormal movements

and estimate management. One of these models analyzes the manipulation of sales, which may result from managers' attempts to temporarily increase sales during a period by relaxing credit policies and offering discounts. These actions do not reflect in cash flow and can harm the organization (Roychowdhury, 2006). Equation 3 below estimates the residuals for the variable REMFcxo:

$$\frac{FCO_{it}}{AT_{it-1}} = \alpha_0 + \beta_1 \left(\frac{1}{AT_{it-1}} \right) + \beta_2 \left(\frac{VEN_{it}}{AT_{it-1}} \right) + \beta_3 \left(\frac{\Delta VEN_{it}}{AT_{it-1}} \right) + \varepsilon_{it} \quad (3)$$

Where:

FCO_{it}: Operating Cash Flow of Entity i in Period t;

AT_{it-1}: Total Assets of Entity i at the Beginning of Period t;

VEN_{it}: Sales of Entity i in Period t;

Δ VEN_{it}: Variation in Sales of Entity i in Period t relative to Period (t-1).

The following model is related to the costs of products and services, where an abnormal increase in production enables a reduction in unit costs, as fixed costs are spread over a larger number of units, enhancing margins. However, this leads to a higher volume of resources unnecessarily allocated to inventory (Roychowdhury, 2006). In Equation 4, the residuals were estimated and transformed into the variable REMProd:

$$\frac{PROD_{it}}{AT_{it-1}} = \alpha_0 + \beta_1 \left(\frac{1}{AT_{it-1}} \right) + \beta_2 \left(\frac{VEN_{it}}{AT_{it-1}} \right) + \beta_3 \left(\frac{\Delta VEN_{it}}{AT_{it-1}} \right) + \beta_4 \left(\frac{\Delta VEN_{it-1}}{AT_{it-1}} \right) + \varepsilon_{it} \quad (4)$$

Where:

PROD_{it}: Cost of Production Added to Inventory (t-(t-1)) of Organization i;

AT_{it-1}: Total Assets of Organization i in Period t-1;

VEN_{it}: Sales of Entity i in Period t;

Δ VEN_{it}: Variation in Sales between Period t and (t-1);

Δ VEN_{it-1}: Variation in Sales between Period (t-1) and (t-2).

The final model estimates discretionary expenses based on variations in sales, general, and administrative expenses, as well as commercial expenses, including Research and Development (R&D) and advertising expenses. In this case, managers attempt to achieve a certain level of profits by cutting these expenses, which can compromise the organization's disclosure process, innovation, and future performance (Roychowdhury, 2006). The residuals from Equation 5 formed the variable REMDesp:

$$\frac{Desp_{it}}{AT_{it-1}} = \alpha_0 + \beta_1 \left(\frac{1}{AT_{it-1}} \right) + \beta_2 \left(\frac{VEN_{it}}{AT_{it-1}} \right) + \varepsilon_{it} \quad (5)$$

Where:

Desp_{it}: Discretionary Expenses (administrative, sales and general) of entity i in Period t;

AT_{it-1}: Total Assets of Entity i in Period t-1;

VEN_{it}: Sales of Organization i in Period t.

The variables REMFcxo and REMDesp are multiplied by -1 to enhance EM, as in these variables, management through operational activities is represented

by abnormally low levels of operating cash flows relative to sales and abnormal cuts in discretionary expenses (Roychowdhury, 2006). Finally, the sum of the residuals generated by the three regressions (REMFcxo, REMProd, and REMDesp) forms the variable REMTotal, which represents management through activities. Table 2 summarizes the variables.

Table 2

Dependents Variables

Variable	Descriptions	Equations	Reference
AEMPae	GR through Discretionary Accruals	Equation 1	(Pae, 2005)
REMTot	GR through Operational Activities (Regressions Residuals 2, 3, and 4)	Equations 2, 3 e 4	(Roychowdhury, 2006)

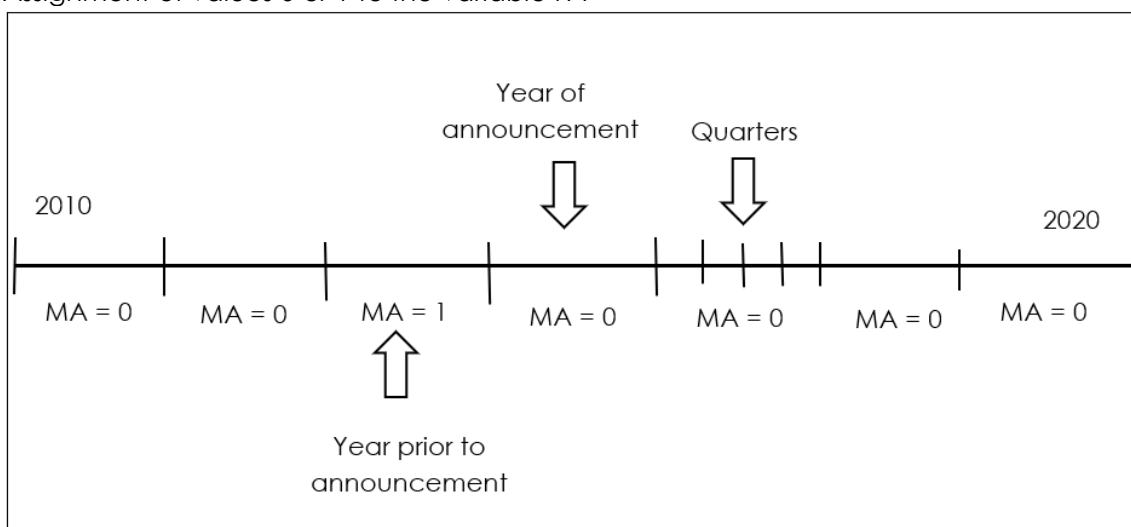
Note: EM (GR): Earnings Management. AEMPae: EM through discretionary accruals; REMTotal: Management through operational activities.

3.4 Variables: Dependent and Independent

To estimate the occurrence of EM in M&As, potential differences in the level of EM one year before the announcement were considered for companies that engaged in at least one M&A during the analyzed period. The variable of interest is a dummy indicating the year prior to the M&A announcement. Thus, if the year of the quarterly accounting information corresponds to the year before the M&A announcement, a value of 1 was assigned, indicating an M&A announcement in the previous year; otherwise, a value of 0 was assigned. Figure 1 illustrates the construction of the FA variable.

Figure 1

Assignment of values 0 or 1 to the variable FA



The dependent variables representing Earnings Management (EM) are obtained through the Pae Model (AEMPae) and the Roychowdhury Model, which sums the results of three regressions: REMFcxo, REMProd, REMDesp, and REMTotal, which represents EM. Table 3 illustrates the econometric model, the variables analyzed, the referenced studies, and the expected relationship for each variable.

Table 3

Econometric Model, Variable Description and Expected Relationship

Econometric Model				
$GR_{it} = \beta_0 + \beta_1FA_{it} + \beta_2TAM_{it} + \beta_3ROA_{it} + \beta_4ALAV_{it} + \beta_5VarACAO_{it} + \beta_6VNEG_{it} + \beta_7MSET_{it} + \varepsilon_{it}$				
Dependent Variable				
Variables	Formulas			References
Earnings Management (EM) (GR)	(EM) (GR)			(Pae, 2005; Roychowdhury, 2006)
Independent Variable of Interest				
Variable	Descriptions	Formulas	Expected Relationship	References
Mergers and acquisitions (MA) (FA)	Variable <i>dummy</i> : 1 – Year prior to M&A announcement; 0 – other years.	-	Positive	(Botsari & Meeks, 2008)
Independent Control Variables				
Company Size (TAM)	Measured by the Natural Logarithm of Total Assets.	$\ln(\text{Total Assets})$	Positive	(Louis, 2004)
ROA	Return on Assets	$ROA = \text{Net Profit} / \text{Total Assets}$	Positive	Botsari & Meeks, 2008)
Leverage (ALAV)	Short- and Long-Term Onerous Liabilities divided by Total Assets	$ALAV = \text{Onerous Debt} / \text{Total Assets}$	Positive	(Gioelli et al., 2013)
Var ACAO	Change in share price	$VarACAO = \text{Current share value} / \text{Previous share value}$	Positive	(Botsari & Meeks, 2008)
VNEG	Value negotiated between companies in M&A	-	Positive	(Campa & Hajbaba, 2016)
MSET	Variable <i>dummy</i> : 1 - companies in the same sector; 0 - companies from different sectors	-	-	(Heron & Lie, 2002)

Notes: GR: Results Management; FA: Mergers and Acquisitions; SIZ: Company size; ALAV: Financial Leverage; VarACAO: Change in share price; MSET: dummy.

According to Louis (2004), company size can influence the salary and other benefits received by managers. The author emphasizes that, according to free cash flow theory, companies with unused cash tend to engage in M&As rather than distribute dividends. Thus, company size may be related to conducting M&As, a situation where EM arises from the possibility of the manager choosing to invest in value-destroying projects.

The Return on Assets (ROA) variable is used as a control variable in the work of Botsari and Meeks (2008). On that occasion, the authors identified a correlation between ROA and discretionary accruals two years before the M&A announcement. Regarding financial leverage, it is assumed that highly leveraged companies have a higher level of EM, as stated by Gioielli et al. (2013). However, the authors found a negative correlation between leverage and EM.

Botsari and Meeks (2008) mentioned that acquirers recognize the possibility of negative returns on their shares due to the market correcting potential overvaluation of assets. Thus, the stock price variation (VarACAO) was used to measure market perception (Campa and Hajbaba, 2016). Accordingly, the authors reported that this variation could be a motivation for EM, which justifies using the variable monetary value traded (VNEG) between companies in M&A transactions.

Heron and Lie (2002) found no evidence that acquiring companies managed results before any M&A. However, they identified a positive correlation between companies engaging in M&As within the same sector and the improvement in their respective operational performance. Thus, a dummy variable (MSET) was used, operationalized as follows: 1 refers to M&As between companies in the same sector, and 0 for those in different sectors.

4 RESULTS ANALYSIS

4.1 Descriptive Statistics

Tables 4 and 5 present the descriptive statistics of the variables characterizing the sample. Comparing EM through Accruals and Operational Activities reveals greater EM in operational activities, given the higher standard deviation and the larger difference between the minimum and maximum values. The largest percentage variation in the traded value between the minimum and maximum is due to the inclusion of transactions that did not involve the literal exchange of monetary resources. Analyzing the stock price variable highlights market volatility, evidenced by the discrepancy between the minimum and maximum values. This result may be related to the market anticipation movement, as described by Botsari and Meeks (2008).

Table 4
Descriptive Statistics: Control Variables

Variables	Mean	Standard Deviation	Minimum	Maximum
GR_PAE	0.001734	0.018441	-0.095284	0.171912
REMTotat	-0.027039	0.070680	-0.286705	0.251408
TAM	22.35611	1.495611	19.18109	26.89315
ROA	0.0047214	0.0231569	-0.1058065	0.1768939
VNEG	650.6802	2743.151	0,00	16.899,35
VarACAO	0.032568	0.305257	-0.900000	4.520000
ALAV	0.3327016	0.1602105	0,00	0.8367052

Notes: GR (EM) Earnings Management; GR_PAE: EM by Discretionary Accruals; REMTotal: EM by Operational Activities; TAM: Company Size; ROA: Return on Assets; VNEG: Value Traded Between Companies in M&A; VarACAO: Stock Price Variation; ALAV: Financial Leverage.

Table 5 presents the values of the dummy variables. A total of 42 M&A (FA) observations were identified. Regarding the configuration of M&As within the same sector (MSET), it was found that there were three times more M&A announcements between companies within the same sector compared to M&As involving companies from different sectors.

Table 5

Descriptive Statistics: Dummies Variables

Variables	Obs.	Quantity with Value 1	Quantity with Value 0
FA	429	42	387
MSET	429	321	108

Notes: FA: Mergers and Acquisitions; MSET: dummy: 1 - companies in the same sector; 0 - different sectors.

4.2 Analysis: Bivariate and Multivariate

The interpretation of correlation determines that if the coefficient is positive, when one variable increases, the other tends to increase as well. However, if it is negative, the other tends to decrease (Fávoro & Belfiore, 2017). It is observed, therefore, that the variables did not show highly significant correlations, as the values obtained are below 0.60.

Table 6

Correlation Matrix

	TAM	ROA	ALAV	VarACAO	VNEG	MSET	GR_PAE	GR_ROY
TAM	1.000							
ROA	-0.001	1.000						
ALAV	0.307***	-0.265***	1.000					
VarACAO	0.020	0.195***	-0.074***	1.000				
VNEG	0.085***	-0.003	0.149***	0.1524	1.000			
MSET	0.300***	0.028	-0.053**	0.060**	0.152***	1.000		
GR_PAE	-0.018	-0.050 **	0.006	-0.145	0.050	-0.028	1.000	
REMTot	-0.006	-0.000	0.008	0.085	-0.033	-0.013	-0.066	1.000

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$; TAM: Size; ROA: Return on Assets; ALAV: Financial Leverage; VarACAO: Stock Price Variation; VNEG: Value Traded Between Companies in M&A; MSET: Dummy: 1 - Companies in the same sector; 0 - Companies in different sectors; GR: Earnings Management; GR_PAE: EM by Discretionary Accruals; REMTotal: EM by Operational Activities.

To estimate potential multicollinearity issues, the Variance Inflation Factor (VIF) and Tolerance tests were applied. Multicollinearity is a matter of degree rather than nature, as correlations between variables will almost always exist. Therefore, the focus should be on identifying variables with a lower degree or strength of correlation, represented by values ranging from -1 to $+1$. For the tested models, the highest VIF was 1.28, and the average VIF was 1.15, as shown in Table 7.

Table 7

Multicollinearity Test Results

Variables	VIF	Tolerance (1/VIF)
FA	1.01	0.99
TAM	1.24	0.80
ROA	1.15	0.86
ALAV	1.28	0.78
VarACAO	1.07	0.93
VNEG	1.19	0.84
MSET	1.13	0.88

VIF Average

1.15

Notes: MA (FA): Mergers and Acquisitions; TAM: Size; ROA: Return on Assets; ALAV: Financial Leverage; VarACAO: Change in share price; VNEG: Value negotiated between companies in the M&A; MSET: dummy: 1 - companies in the same sector; 0 - companies from different sectors.

Five multivariate regressions were estimated using unbalanced panel data: one for discretionary accruals through the Pae Model and four others using Roychowdhury's models, which consider regression residuals (REMFcxo), sales manipulation (REMTot), production increase (REMProd), and discretionary expenses (REMDesp). The Shapiro-Francia and Breusch-Pagan-White tests indicated that the residuals did not follow a normal distribution and did not have constant variance. Since the null hypothesis that the error terms are homoscedastic is rejected in both tests, the models were estimated with robust clustered standard errors. The Chow F-test, Breusch-Pagan Lagrangian Multiplier test, and Hausman test were performed to determine the most appropriate panel data model: POLS, fixed effects, or random effects. The random effects model was deemed the most suitable. The results are presented in Table 8.

Based on the assumption that M&A (the independent variable of interest) promotes an increase in Earnings Management (EM) in Brazilian companies listed on B3, it was observed that the variable of interest (FA) showed statistical significance both in relation to EM estimated through accruals, with a significance level of 1% in the AEMPae variable, and in EM through operational activities (REMTot), with a significance level of 5%.

It is noteworthy that, although statistical significance is observed in three of the analyzed models—through accruals and operational activities—the greatest impact is seen in REMFcxo, with a coefficient value of -0.0221706, compared to the others. However, it is noted that the coefficient for EM through accruals (AEMPae) is positive, while the coefficients for EM through operational activities, represented by the variables REMFcxo and REMTot, are negative.

The results in Table 8 suggest that the announcement of an M&A process is associated with an increase in EM practices through the use of accrual-based accounting procedures (AEMPae). Simultaneously, a reduction in EM through operational activities (REMTot) is observed. This behavior in EM through activities (REMTot) is attributed to the cumulative effect of the variables investigating the different elements of this form of manipulation. Notably, the manipulation of revenues (REMFcxo) and discretionary expenses (REMDesp) tends to decrease after the M&A announcement, presumably due to the significant impacts such an announcement may have on the organization's future performance, through reduced cash flow and operational expenses necessary for the organization's proper maintenance.

Table 8

Result of Multiple Linear Regressions

Variables	AEMPae	REMFcxo	REMProd	REMDesp	REMTot
FA	0.0063499*** (0.0021845)	-0.0221706*** (0.0083747)	0.0011665 (0.005868)	-0.0016211 (0.0019994)	-0.0232677** (0.0114763)
TAM	-0.0002428 (0.0007564)	-0.0021594 (0.0029263)	0.0004774 (0.0026766)	0.0017661 (0.0012921)	0.0004341 (0.1213365)

Variables	AEMPae	REMFcxo	REMProd	REMDesp	REMTotal
ALAV	-0.0025148 (0.005881)	0.03593 (0.0226575)	-0.0272166 (0.0180345)	-0.0097074 (0.0069652)	-0.0080039 (0.0242026)
VarACAO	0.0054626** (0.0026784)	0.0046261 (0.0102718)	-0.0113595 (0.0072622)	0.0027616 (0.0024908)	-0.003307 (0.0138017)
VNEG	8.74e-08 (4.29e-07)	-5.14e-07 (1.66e-06)	1.16e-06 (1.61e-06)	-3.53e-07 (9.50e-07)	3.75e-07 (1.47e-06)
MSET	-0.0024662 (0.0025747)	0.0013896 (0.0099736)	-0.0080844 (0.0096369)	0.0061446 (0.0056553)	-0.0005023 (0.0088624)
Constante	0.0182648 (0.016088)	0.0141516 (0.0622418)	0.0023989 (0.0569097)	-0.0425415 (0.0275697)	-0.0311814 (0.0572199)

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$; Standard error in parentheses.

AEMPae: Regression Residuals (Equation 2) from the Pae model (2005).

REMFcxo: Regression Residuals (Equation 3) from the Roychowdhury model (2006).

REMProd: Regression Residuals (Equation 4) from the Roychowdhury model (2006).

REMDesp: Regression Residuals (Equation 4) from the Roychowdhury model (2006).

REMTotal: Sum of the variables REMFcxo, REMProd, and REMDesp from the Roychowdhury model (2006).

FA: Mergers and Acquisitions; TAM: Size; ALAV: Financial Leverage; VarACAO: Stock price variation; VNEG: Monetary value traded between companies in the M&A; MSET: Dummy variable: 1 - companies in the same sector; 0 - companies in different sectors.

Conversely, the manipulation of production costs (REMPProd), evidenced by the abnormal increase in inventory, appears to rise as a result of business combination processes. However, the impact of this last form of manipulation is outweighed by the combined effects of the other two types.

4.3 Discussion of Results

One year before the M&A announcement, the companies analyzed tended to increase their level of EM through accruals, as per the Pae Model (AEMPae). However, when analyzing EM through operational activities, companies tended to reduce their level of management (Real Activity Models: REMFcxo and REMTotal). Although this finding contrasts with the observations of Campa and Hajbaba (2016), it is important to note that their research focused on U.S. companies operating in a more developed market with stronger corporate governance, differing from the companies analyzed in this research. This aligns with the arguments of Purayil and Lukose (2021), who highlighted that the incentive to reduce EM is more pronounced in countries with strong corporate governance structures. In emerging markets, however, investor protection remains weak.

Discussing the domestic market, Assaf Neto (2021) highlighted characteristics that significantly influence the business environment examined in this study, such as the concentration of ownership or capital in publicly traded companies and the high issuance rate of non-voting preferred shares. These characteristics lead to agency conflicts between majority shareholders and the neglect of minority shareholders. The author also emphasized that a substantial portion of finance literature focuses on external economic environments with distinct realities from the Brazilian market, underscoring the need for studies in other economic contexts.

Supporting this argument, Assaf Neto (2021) added that countries with more robust corporate governance standards exhibit greater credibility and transparency in reported information, reducing informational asymmetries among managers, investors, and majority and minority shareholders. Moreover, companies with strong corporate governance practices and more dispersed capital structures face lower risks and, consequently, lower capital costs. Sloan (1996) previously highlighted the indirect importance of corporate governance, as strong governance practices help ensure that companies provide transparent, high-quality information, thereby reducing the likelihood of aggressive EM that could bias users' decisions.

The positive relationship between accrual-based EM and M&A can be understood by considering the incentive acquirers must report higher profits. According to Erickson and Wang (1999), operating results directly influence stock prices. Companies reporting higher profits are perceived by the market as healthier and more successful, which can increase their stock valuations. In M&A contexts, this is particularly relevant since higher stock valuations allow acquirers to use fewer shares in acquisitions, optimizing transaction costs.

Zhang (2015) reinforced this idea, arguing that companies are incentivized to manipulate reported profits before an acquisition in hopes of increasing their stock prices, thereby reducing the cost of acquiring the target company. Zhang suggested that managers might use EM as a mechanism to elevate the acquirer's stock price before the contract date, as higher stock values reduce the number of shares required for the acquisition.

Among the control variables, ROA was the only one with statistically significant results in both the accrual-based and some operational activity models. A negative ROA coefficient may indicate that companies with higher asset profitability tend to engage less in EM in the period preceding the announcement compared to other analyzed years. Campa and Hajbaba (2016) observed a similar behavior with this control variable.

For stock price variation (VarACAO), statistically significant results were identified, suggesting a positive relationship between stock price variation and accrual-based EM. This finding aligns with the results of Erickson and Wang (1999), Botsari and Meeks (2008), Zhang (2015), and El Diri (2018). According to Zhang (2015), an acquirer perceiving undervaluation or overvaluation is incentivized to manipulate reported profits before an acquisition to increase stock prices and reduce the acquisition cost of the target company.

Adjustments made through accruals, as per accrual accounting principles, have the potential to alter reported financial results without immediate effects on cash flows, as these adjustments are typically reversed in subsequent periods (Pae, 2005). However, increased EM through operational activities (REMTot) directly impacts cash flows, potentially compromising financial performance in the periods following the M&A. This circumstance could influence investor perceptions of the effectiveness of the M&A process and affect the evaluation of the responsible manager.

In this context, the concern about not compromising real financial performance due to M&A processes seems to suggest a preference for accrual-

based EM strategies over operational activity management. This implies that managers may opt to manipulate accounting information through accrual adjustments rather than directly influencing the company's operational activities. The positive effect on AEMPae and the negative effect on REMTotal support the idea that managers select and use management strategies based on available opportunities, with varying intensities depending on specific circumstances. These strategies may be complementary, with aligned impacts, or substitutes, with opposing effects, as observed in this research. This aligns with the findings of Zang (2012) and Cupertino et al. (2017) regarding the relationship between these two manipulation strategies.

The observed results support Liu et al. (2014), who argued that increased accrual-based EM and reduced operational activity management occur depending on the acquirer's objectives. Accrual-based EM is more susceptible to future reversals, as it involves non-monetary accounts, whereas operational activity management affects cash directly, leading to less frequent use. Accrual-based EM recognizes profits without impacting total revenue, capital costs, or risk. Conversely, operational activity management can have negative post-M&A consequences by affecting accounts that influence revenue, capital costs, and company risk.

The evidence suggests that listed companies on B3 engaged in EM—measured through Roychowdhury's model (2006)—one year before executing M&A processes. Based on Agency Theory, it is inferred that gains may be negative as managers might pursue M&A for personal interests rather than corporate priorities. This aligns with explanations in Agency Theory, which argue that increased company size through M&A makes managers more inclined to pursue deals even with value destruction due to negative net present value investments (Jensen and Meckling, 1976; Ross et al., 2015).

The evidence further underscores informational asymmetries, as specified by Seth et al. (2000). Acquirers' managers might focus on maintaining negotiations with overvalued stock prices, potentially resulting in real efficiency losses for investors. Losses occur because managers use discretion in accounting choices and operational cash flows (Phillips et al., 2003). By intentionally managing results, managers alter the substance of economic transactions and the reporting of related information, biasing financial analysis and decision-making. This diverts stakeholders' focus from the company's real economic performance, creating conflicts of interest and harming external users of the reported information (Healy & Wahlen, 1999; Schipper, 1989).

Agency Theory explains these conflicts, noting that, in M&A cases, gains may be negative because managers act in their self-interest over corporate goals (KloECKner, 1994). Managers may pursue M&A deals even with negative net present value (Jensen and Meckling, 1976; Ross et al., 2015). Informational asymmetry occurs when acquiring managers have access to target company insights unavailable to external investors. With greater access, they may act opportunistically, neglecting corporate results maximization and contract efficiency between shareholders and managers, prioritizing personal interests over corporate goals (Jensen & Meckling, 1976).

5 FINAL CONSIDERATIONS

This study aimed to identify evidence of Earnings Management (EM) estimated through discretionary accruals using the Pae Model and operational activities estimated through Roychowdhury Models. The economic and financial data covers the period from 2010 to 2020, while the data on Mergers and Acquisitions (M&A) announcements span from 2011 to 2019. To conduct the analyses and search for evidence, multiple linear regressions with panel data were employed.

The main results indicate evidence that the analyzed acquiring companies increased their level of EM through real activities one year before the M&A announcement. The increase observed in the accrual-based model aligns with findings from Erickson and Wang (1999), Louis (2004), Botsari and Meeks (2008), and Lee (2008). However, the reduction in EM through real/operational activities diverges from the observations of Campa and Hajbaba (2016). When analyzed together, these results support the conclusions of Zang (2012) and Cupertino et al. (2017), suggesting that management strategies are tools employed as opportunities arise to benefit managers, albeit with varying intensities depending on the circumstances, either complementarily or as substitutes, as evidenced during M&A processes.

Additionally, it was found that in the context of the Brazilian stock exchange (B3), the results corroborate the arguments of El Diri (2018), who stated that M&A processes are among the factors driving EM when considered under both models: Pae's (2005) accrual-based model and Roychowdhury's (2006) model. Another result identified in this study is the association between stock price variation in the period immediately preceding the M&A announcement, a particularly important factor for M&A operators and investors. This influence affects stock price variation in the capital market and creates informational asymmetries that impact decisions and lead to consequences during the process (El Diri, 2018).

In summary, there is a fine line between resource optimization and EM in M&A processes, as they raise ethical concerns and, in many cases, cross the boundary into fraud. These findings provide evidence of potential conflicts of interest between managerial objectives and corporate goals. Additionally, the identified results offer empirical insights into the relationship between M&A and EM while drawing the attention of regulators to the topic, highlighting possible opportunistic behaviors of managers in the context of M&A.

One limitation of this study is the lack of information about the payment method used in M&A processes, as payment in shares might have a greater influence on EM, potentially leading to artificially inflated stock prices to reduce acquisition costs. Future research could enrich the understanding of this phenomenon by conducting comparative analyses of various periods preceding M&A announcements, as well as investigating evidence of EM effects on target companies. Other possibilities include using logistic regression to estimate the likelihood of companies engaging in EM during M&A or extending the temporal scope and sample size to include more companies.

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