

Managerial ability and earnings management

Habilidade gerencial e gerenciamento de resultados contábeis

Habilidad gerencial y gestión de resultados contables

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Abstract

The study aims to verify the relationship between the managerial ability of managers and the level of earnings management by accruals (AEM) and by real activities (REM) in Brazilian companies. Data from 2013 to 2018, corresponding to 228 non-financial companies, were analyzed through regression TOBIT. The results support a positive relationship between managerial ability and earnings management practices by accruals and real activities. Specifically, more skilled managers are associated with earnings management, which reduces the quality of accounting information. The findings support the premise that more skilled managers manage financial reporting to camouflage compensation, privileges, and excessive investment in risky projects. Furthermore, it sheds light on how individual idiosyncratic differences can affect accounting reports.

Keywords: Managerial Ability; Earnings Management: AEM; REM

Resumo

O objetivo do estudo consiste em verificar a relação entre a habilidade gerencial e o nível de gerenciamento de resultados por *accruals* (AEM) e por atividades reais (REM) em empresas brasileiras. Os dados do período de 2013 a 2018, correspondentes a 228 empresas não financeiras, foram analisados por meio de regressão TOBIT. Os resultados suportam uma relação positiva entre a habilidade gerencial e as práticas de gerenciamento de resultados por *accruals* e por atividades reais. Especificamente, gestores mais habilitados estão associados à prática de gerenciamento de resultados, o que reduz a qualidade das informações contábeis. Tais resultados apontam que gerentes de maior habilidade a uma melhor gestão dos recursos da empresa podem resultar em menor qualidade das informações contábeis. Esta pesquisa contribui para preencher a lacuna anterior de características gerenciais relacionadas à habilidade no gerenciamento de resultados. O estudo contribui para pesquisadores, profissionais e outros interessados em entender os determinantes e a realização das práticas de gerenciamento de resultados.

Palavras-chave: Habilidade Gerencial; Gerenciamento de Resultados; AEM; REM

Resumen

El objetivo del estudio es verificar la relación entre la habilidad gerencial de los gerentes y el nivel de gestión de utilidades por devengos (AEM) y por actividades reales (REM) en empresas brasileñas. Los datos de 2013 a 2018, correspondientes a 228 empresas no financieras, se analizaron mediante regresión TOBIT. Los resultados respaldan una relación positiva entre la habilidad gerencial y las prácticas de administración de ganancias por devengos y actividades reales. Específicamente, los gerentes más capacitados están

asociados con la práctica de la administración de ganancias, lo que reduce la calidad de la información contable. Los hallazgos respaldan la premisa de que los gerentes más capacitados administran los informes financieros para camuflar la compensación, los privilegios y la inversión excesiva en proyectos riesgosos. Además, arroja luz sobre cómo las diferencias idiosincrásicas individuales pueden afectar los informes contables.

Palabras clave: Gestión Habilidad; Gestión de resultados; AEM; REM

1 Introduction

The main objective of financial reports is to provide useful information for decision-making (Financial Accounting Standards Board – FASB, 2010; Baik et al., 2019). It is widely believed that earnings management (EM) negatively affects earnings quality and reduces the credibility of a company's financial statements (Hsieh et al., 2018). EM occurs when managers take advantage of the flexible nature of accounting standards to create financial statements that more favorably reflect a company's financial performance (Sloan, 1996; Healy & Wahlen, 1999; Braam et al., 2015). Such practices can bias the decisions of market participants.

Generally, EM occurs through discretionary accruals (Accruals Earnings Management - AEM) or - AEM) or through real activities (operational decisions). Concerning the first, Libby and Seybert (2009) argue that this EM practice occurs from the accounting decisions of managers and administrators to involve their judgment and estimates in the implementation of generally accepted accounting principles (Generally Accepted Accounting Principles - GAAP), that is, abnormal accruals are intended to capture distortions induced by the application of accounting rules and that lead to an imperfect measurement system (Dechow et al., 2010).

On the other hand, the management of results by real activities (Real Earnings Management - REM), according to Roychowdhury (2006), occurs from operational decisions that deviate from normal practices. For Bertrand and Schoar (2003), the company's underlying decisions, such as mergers and acquisitions or aggressive investment in research and development, reflect the different skills of managers.

This study extends previous studies on earnings management by identifying managerial ability as a determinant of its practice. For managerial ability, the model by Demerjian et al. (2013). The authors assess managerial ability based on the efficiency of managers, compared to their industry peers, in transforming corporate resources into revenue. For this, the following revenue-generating factors are considered: inventory cost, general and administrative expenses, fixed assets, operating leases, research and development (R&D) expenses, and intangible assets. In general, skilled managers generate more revenue for a given level of resources or, conversely, minimize the resources used for a given level of income, maximizing resource efficiency (Demerjian et al., 2012).

The link between the use of management practices and managerial ability made by more skilled managers who better manage company resources strengthens positive results (Huang & Sun, 2017) and increases the quality of information (Demerjian et al., 2013). On the other hand, managers with high managerial ability may produce reports of reports facilities to hide their compensations, privileges, and excessive investments in risky projects to extract their benefits (Habib & Hasan, 2017; Baik et al., 2019).

Previous studies suggest that managerial ability affects the company's economic results and influences accounting practices and information (Bertrand & Schoar, 2003; Gabaix & Landier, 2008; Demerjian et al., 2012; Gounopoulos & Pham, 2018). In terms of the quality of accounting information, managerial ability plays an important role, as managers influence the implementation of accounting principles and the preparation of financial statements (García-Meca & García-Sánchez, 2018; Baik et al., 2019). Those with high managerial ability have a deeper understanding of financial and accounting issues, which, for the most part, are used to make decisions about accounting choices that impact the quality of information (García-Meca & García-Sánchez, 2018; Gounopoulos & Pham, 2018).

This article differs from precursor studies that have already analyzed managerial ability and the quality of accounting information, when considering earnings management practices, both by accruals and by real activities, in the Brazilian scenario, as a proxy for the quality of accounting information.

Previous research has demonstrated significant effects of managerial ability on corporate decisions, such as investing and financing (Bertrand & Schoar, 2003), voluntary disclosure strategies (Bamber et al., 2010), financial reporting (Ge et al., 2011; Notbohm et al., 2011; Notbohm et al., 2019), quality of accounting information (Demerjian et al., 2012; Demerjian et al., 2013) and income smoothing (Baik et al., 2019).

However, it is understood that the relationship between managerial ability and EM practices is still an empirical issue that needs to be deepened (García-Meca & García-Sánchez, 2018), especially in the Brazilian context, where the literature relates management, especially at a company level, such as about corporate governance (Barros et al., 2013; Mazzioni et al., 2015), audit firms (Azevedo & Costa, 2012), the adoption of international accounting standards (Klann & Beuren, 2018) and the cost of debt (Nardi & Nakao, 2009). This study explores this research gap, on the relationship between managerial ability and the level of earnings management by discretionary accruals and by real activities.

Previous studies of financial reporting have extensively explored the determinants of EM. Although

most of this literature has focused on firm-specific characteristics (Francis et al., 1999; Klein, 2002; Dechow & Dichev, 2002), the effects of manager-specific characteristics on earnings have attracted attention and interest of academics recently (Hsieh et al., 2018). The expansion of knowledge about what is related to the use of EM practices is an important research question (Hsieh et al., 2018), and it is no different in the Brazilian context.

In Brazil, as it is a country with a code-law system (La Porta et al., 1998), with a less developed capital market and with weaker legal protection for investors, the management of earnings management tends to be more pronounced (Lang et al., 2003; Leuz et al., 2003), which makes its evaluation timely. In addition, since the specific characteristics of countries can affect the way companies carry out financial disclosure, studying the Brazilian case allows the analysis of companies that operate in the same institutional, political and socioeconomic context, ensuring better comparability of accounting information (Santana et al., 2019).

The study used the managerial ability score proposed by Demerjian et al. (2013), together with the models by Kothari et al. (2005) and Roychowdhury (2006) to investigate EM by discretionary accruals and by real activities, respectively. When using a sample of Brazilian companies listed on B3 S/A - Brasil, Bolsa, and Balcão (B3) during the period from 2013 to 2018, evidence was found that managerial ability is positively related to EM by accruals and by activities real. Therefore, in the Brazilian scenario, it can be said that more skilled managers would tend to manage more profits.

This result differs from those found by Hasan (2018), Demerjian et al. (2013), and Koh (2011), who highlight that more skilled managers are less likely to manage results. The positive relationship found in this study can be explained by some factors. Recognition by the media of CEOs with greater skill leads to a high level of expectation about the performance to be presented to the capital market (Koh, 2011). Graham et al. (2005) report that the recognition of the ability of CEOs leads to incentives to avoid surprises in earnings, as any sign of inability to meet earnings benchmarks can be interpreted, in the face of the market, as a managerial failure.

In this aspect, more skilled managers would be more sensitive about their reputation in the market, which seems to be the case in the Brazilian scenario. Furthermore, concerning personal aspects and the impact on personal wealth, CEOs have incentives to avoid negative reactions to stock prices (Cheng & Warfield, 2005), which, in addition to compromising their reputation, could impact their compensation. Such scenarios can put pressure on the attitudes of CEOs recognized as more skillful, encouraging them to use earnings management practices to provide accounting information that meets market expectations.

This study contributes to the expansion of the literature on managerial ability and earnings management. For the most part, EM practices are related to company-level characteristics and do not encompass the possible influence of managers' characteristics. Hasan (2018) and Bamber et al. (2010) highlight the importance of evaluating how individual idiosyncratic differences affect accounting reports. This study expands the analysis of these factors in relation about studies and initiates the debate in the Brazilian context. By demonstrating that the negative relationship between managerial ability and earnings management, observed in the international literature, may not be confirmed in certain contexts, it opens a research gap to investigate which personal, environmental factors can affect this relationship.

In addition, this research highlights the importance of managerial ability in the quality of accounting information (Demerjian et al., 2013; Demerjian et al., 2017). As investors depend, among other factors, on accounting reports to assess the company's current performance and prospects, it is important to verify how managerial ability interferes with the manager's opportunistic practice and the quality of the reported information. Furthermore, the results of the study are important for board members and senior management, particularly in terms of aligning compensation costs versus benefits for skilled managers. If such managers produce more informative, higher-quality accounting reports, the company can benefit from a reduction in the cost of capital, for example. According to Demerjian et al. (2013), managerial ability, by affecting the quality of reported results beyond the company's operations, tends to impact attributes related to stock price and companies' exposure to litigation. This impact can be positive or negative, depending on whether the manager uses his skill for his benefit or benefit of the company.

The study is structured in six sections, encompassing: the introduction and background and research hypothesis, methodological procedures for achieving the results, presentation of the results found, and, finally, the final considerations of the research and the references.

2 Background and Research Hypotheses

Senior Management Theory states that organizational results are partially influenced by the different skills of managers (Hambrick & Mason, 1984; Hambrick, 2007). Demerjian et al. (2012) introduced a new measure of managerial ability based on managers' efficiency in generating revenue. Managerial ability reflects the ability of managers to understand the company's savings and make prudent and timely economic decisions that allow them to turn corporate resources into revenue (Hasan, 2018).

The most skilled managers better understand the technology and industry trends, reliably forecast product demand, invest in higher-valuable projects, and manage their employees more efficiently than less

skilled managers (Demerjian et al., 2012). Studies show that managerial ability has an impact on accounting policy and company performance (Bertrand & Schoar, 2003; Demejian et al., 2013; Andreou et al., 2017).

The national literature on managerial ability is still incipient. Moura et al. (2019) showed that in Brazil, managers of companies in the “non-cyclical consumption” sector showed higher indicators of managerial ability, followed by managers of companies in the “health” and “cyclical consumption” sectors. In addition, they found that the most skilled managers could avoid or reduce goodwill losses.

Still, on the national scene, Santos (2020) analyzed the effect of managerial ability on the relationship between executive compensation and earnings management practices. The author identified that managers with lower levels of managerial ability were less likely to achieve high levels of variable remuneration, which can generate motivations for the practice of earnings management to increase their remuneration.

Skilled managers have a better understanding of their company's business (Mahoney, 1995; Coff, 1997; Demerjian et al., 2012). Demerjian et al. (2012) argue that more skilled managers visualize business opportunities, make better decisions, and better manage their firms to maximize shareholder benefits, compared to less capable managers. Studies present evidence that high-skill managers improve their companies' information environment (Bamber et al., 2010; Dyreng et al., 2010; Ge et al., 2011; Yang, 2012; Demerjian et al., 2013; Dejong & Ling, 2013; Baik et al., 2018). Demerjian et al. (2013) show that the quality of earnings increases when the manager has the managerial capacity, while Baik et al. (2019) report that companies with high-skill managers have more predictable earnings.

Using their measure of managerial ability, Demerjian et al. (2013) examined the relationship between managerial ability and quality of results, demonstrating that managers with greater skill are associated with higher earnings and persistence of accruals, lower errors in the provision of doubtful debts, and estimates of accruals. Bamber et al. (2010) and Ge et al. (2011) evaluated the effects of managerial characteristics on the quality of financial reports and documented that managers have a significant effect on companies' disclosure policies and financial reporting attributes such as discretionary accruals and accounting conservatism (Ge et al., 2011).

In this sense, specific characteristics of managers can considerably influence companies' financial information and disclosure options (Hasan, 2018), in addition to becoming a significant determinant of accounting choices (Ge et al., 2011). Furthermore, managers with greater skills tend to be better able to estimate accruals, resulting in a more accurate measure of earnings (Demerjian et al., 2013).

As more skillful managers are better informed about their business and can therefore make more effective judgments and estimates, they can be more effective in transforming company resources and thus achieving better business performance (Wang et al., 2017). In addition, the decrease in the risk of business failure due to better managerial ability will mitigate the risk of continuity (Krishnan & Wang, 2015). In this way, managerial capacity would reduce the financial pressure on companies and, in turn, the likelihood of them getting involved in earnings management practices.

Furthermore, studies in the field of managerial ability show that more capable managers improve profits to maximize shareholder benefits (Demerjian et al., 2017), engage in less tax evasion activities (Francis et al., 2013), and report higher quality gains (Demerjian et al., 2013). When investigating award-winning managers (high reputation), Koh (2011) observed that managers recognized as celebrities adopt more conservative accounting and are less likely to manage earnings opportunistically.

Companies with skilled managers are less likely to retract their financial performance. This is because such managers are better able to effectively select and execute positive projects that generate superior performance, profitability, and success (Chang et al., 2010; Demerjian et al., 2012; Andreou et al., 2017; John et al., 2017). Thus, skilled managers have incentives to be more promising, issuing more readable disclosures to signal their superior capacity (Hasan, 2018) and minimizing EM practices.

In this context, the first research hypothesis was elaborated, which portrays the expectation that the presence of more skilled managers within organizations will contribute to the reduction of the use of management practices by discretionary accruals.

H₁: Managerial ability is negatively related to earnings management by accruals.

REM is defined as deviations from normal operating practices, motivated by managers' desire to demonstrate to stakeholders that certain financial reporting goals have been achieved in the normal course of operations (Roychowdhury, 2006). While the underlying incentives for companies to engage in REM are like the motivations to engage in EM through accruals, executives may prefer to manage earnings through REM rather than AEM for a few reasons. First, managers find REM more ethical and more acceptable than EM for accruals (Bruns & Merchant, 1990). Second, REM attracts less public attention and less auditor scrutiny, as managing earnings through real activities, such as discounting sales and overproduction, is more difficult to detect.

For a given set of resources the company has, the most skilled managers can generate higher sales revenue and are therefore less likely to be under earnings management pressure. In this way, such managers understand the negative impact of management on real activities (Cohen & Zarowin, 2010).

Huang and Sun (2017) found that managers with greater managerial ability engage less in EM for actual activities and, in addition, can more efficiently reduce the negative impact of REM on the company's future performance.

Bertrand and Schoar (2003) suggest that the company's underlying decisions (e.g., investment in research and development, merger, and acquisition) reflect different styles of managers. The evidence from Huang and Sun (2017), that managerial ability harms REM, complements the idea that high-skill managers can generate revenue with higher sales for a given set of company resources (Demerjian et al., 2012), and high-capacity managers understand the value-destroying consequences of REM on the company's future performance (Roychowdhury, 2006; Cohen & Zarowin, 2010). Thus, it is less likely that such managers choose to use abnormal practices during the organization's operational activities.

Demerjian et al. (2012) suggest that high-skill managers have superior knowledge of the company's operating environment, which allows them to better align the company's operational decisions with financial reporting strategies. Given the superior understanding of these managers, it is expected that they will be able to estimate future earnings and shortfalls sooner than less capable managers, therefore, they have more options and are less likely to perform the REM. If more skilled managers have more knowledge and make better decisions that lead to a lower level of opportunistic behavior, the better the future performance of the company and the more efficient the management of resources, thus, their decisions can mitigate the practice of REM (Huang & Sun, 2017).

With this, it is expected that the presence of greater managerial ability in managers will contribute to a reduction in the level of use of management practices in real activities. Such a basis is proposed in the second research hypothesis.

H₂: Managerial ability is negatively related to earnings management through real activities.

However, previous studies showed a negative relationship between managerial ability and the quality of accounting information, such as Demerjian et al. (2017) and Baik et al. (2019). The authors identified that more skilled managers are more likely to practice income smoothing. Such evidence reinforces the authors' perspective that high-skill managers have incentives for earnings smoothing since the capital market benefits shareholders due to the company's positive results, which reinforces the manager's reputation as skilled.

In the same sense, more skilled managers, to maintain above-average managers in the management of the company, can resort to accounting earnings management practices. Also, Malmendier and Tate (2009) suggest that the company, whose managers have a high reputation, tends to manage its results to meet performance expectations and increase its remuneration, after obtaining awards as the best executive.

3 Research Methods and Procedures

3.1 Population and sample

To meet the objective of verifying the relationship between managerial ability and the level of earnings management by discretionary accruals and by real activities, this study encompassed the population of Brazilian companies listed on B3 S/A – Brasil, Bolsa, e Balcão (B3) in the period from 2013 to 2018. For data collection, the Refinitiv Eikon database and financial statements were used, including the statement of comprehensive income and explanatory notes.

For the delimitation of the sample, companies that did not present the necessary variables, either for the calculation of managerial ability or the level of earnings management, and those belonging to the financial sector were excluded, as they presented different characteristics concerning sectors. Thus, the final sample of the study consisted of 228 companies, with the most representative sectors of discretionary consumption, industrial and public utilities, as shown in Table 1.

3.2 Variable Definitions

3.2.1 Management Ability Variable

Measuring managerial ability becomes difficult, as it is not possible to observe them directly. Demerjian et al. (2012) developed a quantitative measure of managerial ability, which captures the efficiency with which managers convert company resources into sales, relative to their peers in the same industry. This measure was built on the intuition that more skilled managers can generate more sales revenue for a given set of inputs (eg, labor, capital, and intangible assets).

It is noteworthy that managerial ability is inferred from the company's observable results and not from the manager's characteristics. In this way, managerial ability is related to managers' decisions about the allocation of the entity's resources.

Table 1
Sample of the survey by economic sector

Sectors – GICS Sector Name	Companies	%
Basic Consumption	21	9,21
Discretionary Consumption	56	26,32
Health Care	7	3,95
Energy	6	3,07
Real Estate and Lease	15	6,58
Industrial	40	17,54
Materials	24	10,96
Communication Services	7	3,51
Public Utility Services	37	16,23
Information Technology	6	2,63
Total	219	100%
Period analyzed	6 years	
Number of observations	1.314 observations	

GICS: *Global Industry Classification Standard*; Period analyzed: 2013 to 2018.

Source: survey data.

The estimation of managerial ability goes through the estimation of the MA-Score, developed by Demerjian et al. (2012). The score is responsible for generating an estimate of how efficiently managers use the resources of their companies, with managers with high skills generating a higher rate of production, from inputs, than managers of inferior quality. More precisely, the authors use the Data Envelopment Analysis (DEA) to estimate the efficiency of the company, comparing the sales generated in each firm, conditioned to the use of the following inputs: cost of goods sold (COGS), selling and administrative expenses (SAE), property, plant, and equipment (PPE), operating leasing (OLE), research and development expenses (R&D), acquired goodwill (AG) and other intangible assets (OIA). According to Demerjian et al. (2012), the following optimization problem is applied:

$$\max_v \theta = \frac{\text{Sales}}{v_1 \text{COGS} + v_2 \text{DAE} + v_3 \text{PPE} + v_4 \text{OLE} + v_5 \text{R\&D} + v_6 \text{AG} + v_7 \text{OIA}}$$

The optimization finds the firm-specific vector of optimal weights in the seven inputs v , comparing each of an individual firm's input options with those of the other firms in its estimation group. The DEA efficiency measure assumes a value between 0 and 1, responsible for indicating the degree to which the company is efficient. Observations with value 1 are the most efficient and the set of firms with such efficiency draws a boundary through the efficient set of possible combinations of inputs. Observations with efficiency measure less than 1 fall below the boundary. A company with a score of less than 1 would need to reduce costs or increase revenues to achieve efficiencies.

The efficiency measure generated by the DEA estimate is attributable to the company and the manager. A more skilled manager will be able to predict trends regardless of company size, while a manager in a larger company will, on average, be better able to negotiate terms with suppliers, regardless of their quality. From this context, Demerjian et al. (2013) modified the measure of firm efficiency generated by DEA, differentiating it from the main firm-specific characteristics that may help or hinder management efforts, including firm size, market share, free cash flow, and age. The TOBIT regression model presented in Equation 1 is estimated, controlling for the sector effect:

Equation 1

$$EF_{it} = \alpha_0 + \alpha_1 \text{LN}(TA)_{it} + \alpha_2 \text{MS}_{it} + \alpha_3 \text{FCF}_{it} + \alpha_4 \text{LN}(\text{AG})_{it} + \alpha_5 \text{CSB}_{it} + \alpha_6 \text{IEV}_{it} + \sum \text{effect_fixed_sector}_t + \varepsilon_{it}$$

Where:

EF_{it} = efficiency of firm i in period t ;

$\text{LN}(TA)_{it}$ = natural logarithm of total assets of the company i in period t ;

MS_{it} = market share of company i in period t ;

FCF_{it} = free cash flow of company i in period t ;

$\text{LN}(\text{AG})_{it}$ = natural logarithm of company age;

CSB_{it} = concentration indicator of the business segment of company i in period t ;

IEV_{it} = indicator of exchange variation adjustment of the company i in period t ;

ε_{it} = residual of the equation (proxy for managerial ability).

The company efficiency (EF_{it}) corresponds to the score optimized by the DEA. As for the independent variables, it should be recognized that the free cash flow (FCF_{it}) encompasses a dummy variable, in which one was assigned to companies that reported positive values and zero otherwise; the business segment concentration indicator (CSB_{it}) represents the proportion between sales in the main

segment and other operating segments (information obtained in the explanatory notes of each company), and for companies operating in a single segment, one was assigned; and the exchange variation adjustment indicator (IEV_{it}) corresponds to a dummy variable, in which one was assigned to companies that performed exchange variation adjustments in the period and zero otherwise.

The residual of the estimate of Equation 1 is attributed to the management team and is representative of managerial ability, becoming the managerial ability variable (MA_{it}) used in this study. Also, a second variable (MA_Rank_{it}) was created, which is the classification by quintile (by sector and year) of the MA, numbered from 1 to 5, as presented by Demerjian et al. (2013). The purpose of using quintiles, according to Demerjian et al. (2013), is to facilitate the comparison of the indicator by time and sector and mitigate the influence of extreme observations.

The managerial ability measure based on Demerjian et al. (2013) has some advantages. First, it is a manager-specific measure, while others are typically company-specific. Demerjian et al. (2012) showed that the DEA-based measure is more attributable to manager effects than to company effects. Second, managerial ability is measured directly from the company's actual performance reflected in the financial statements, rather than relying on factors that are perceived by third parties (e.g., media citations and CEO awards) (Baik et al., 2019). For example, the media citations measure is criticized for not being significantly associated with company performance, in addition to being biased due to the media's incentives (LaFond, 2008).

Concerning the use of metrics in Brazil, the measure of managerial ability was used in studies such as Moura et al. (2019) and Santos (2020). Studies have proven relationships between managerial ability and goodwill loss reduction, as well as motivations for earnings management. Such applications and findings prove the acceptability of Demerjian et al. (2013) in the Brazilian scenario.

3.2.2 Earnings Management Variables

Total accruals (ACC) were calculated by the difference between the company's profit or loss in the period and the company's operating cash flow in the period (Hribar & Collins, 2002; Paulo et al., 2007), is calculated indirectly under the balance sheet perspective.

The estimation of discretionary accruals followed the model by Kothari et al. (2005), operationalized by sector and year. This represents an extension of the Jones (1991) and Modified Jones (Dechow et al., 1995) models, by adding return on assets (ROA) as an explanatory measure of total accruals. Equation 2 summarizes its operationalization.

Equation 2

$$ACC_{it} = \alpha \left(\frac{1}{A_{it-1}} \right) + \beta_1 (\Delta REV_{it} - \Delta AR_{it}) + \beta_2 (FAS_{it}) + \beta_3 (ROA_{it}) + \varepsilon_{it}$$

Where:

ACC_{it} = total accruals of a company i in period t , scaled by A_{it-1} ;

A_{it-1} = total assets of company i in period $t-1$;

ΔREV_{it} = change in net revenues of a company i in period t , scaled by A_{it-1} ;

ΔAR_{it} = change in accounts receivable of a company i in period t , scaled by A_{it-1} ;

FAS_{it} = fixed assets of a company i in period t , scaled by A_{it-1} ;

ROA_{it} = return on assets of a company i in period t , scaled by A_{it-1} ;

ε_{it} = regression error (proxy for earnings management by discretionary accruals).

The estimation of EM by real activities was operationalized by the models proposed by Roychowdhury (2006) by sector and year, which examine real activities by discretionary expenses, production costs, and operating cash flow. Equations 3 to 5 summarize such models, respectively.

Equation 3

$$\frac{DD_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 \left(\frac{\Delta S_{it-1}}{A_{it-1}} \right) + \varepsilon_{it}$$

Where:

DD_{it} = discretionary expenses of a company i in period t , obtained by adding together advertising, R&D, sales, general and administrative expenses;

A_{it-1} = total assets of a company i at the end of period $t-1$;

ΔS_{it-1} = variation in sales of company i from period $t-2$ to period $t-1$;

ε_{it} = regression error (proxy for earnings management by discretionary expenses).

Equation 4

$$\frac{PC_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{it-1}} \right) + \beta_1 \left(\frac{S_{it}}{A_{it-1}} \right) + \beta_2 \left(\frac{\Delta S_{it}}{A_{it-1}} \right) + \beta_3 \left(\frac{\Delta S_{it-1}}{A_{it-1}} \right) + \varepsilon_{it}$$

Where:

PC_{it} = production costs of a company i in period t , obtained by the sum of the COGS and the variation of the stock;

S_{it} = sales of company i in period t ;

ΔS_{it} = variation in sales of a company i from period t to period $t-1$;

ε_{it} = regression error (proxy for earnings management by production costs).

Equation 5

$$\frac{OCF_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \left(\frac{1}{A_{it-1}} \right) + \beta_1 \left(\frac{S_{it}}{A_{it-1}} \right) + \beta_2 \left(\frac{\Delta S_{it}}{A_{it-1}} \right) + \varepsilon_{it}$$

Where:

OCF_{it} = operating cash flow of company i in period t .

The three EM measurements by actual activities were combined into an aggregate metric, according to Cohen and Zarowin (2010), and Cupertino et al. (2016), among others to identify the global effect of this management practice. This metric is the REM variable, which comprises the sum of abnormal cash flows (REM_{OCF}) and abnormal discretionary expenditures (REM_{DD}) both multiplied by -1, added to abnormal production costs (REM_{PC}).

3.2.3 Control variables

A set of control variables was used, which can potentially impact measures of managerial ability and earnings management. Table 2 summarizes the operationalization of these variables.

Table 2

Control Variables

Variables	Operationalization	Reference
Company size (SIZ_{it})	Natural logarithm of total assets at the end of period t .	Dechow e Dichev (2002); Hibrar e Nichols (2007); Demerjian, Lev, Lewis e McVay (2013)
<i>Big Four</i> (BF_{it})	Dummy variable, with 1 for companies audited by big four auditing firms; 0 otherwise.	Becker, DeFond, Jiambalvo e Subramanyam (1998); Demerjian, Lev, Lewis e McVay (2013)
Variation in Sales Growth (VSG_{it})	One-year change in sales growth, with: $\left(\frac{\Delta S_{it}}{S_{it-1}} \right) - \left(\frac{\Delta S_{it-1}}{S_{it-2}} \right)$	Demerjian, Lev, Lewis e McVay (2013)
Loss Ratio (LOR_{it})	Percentage of years in which the company reported losses in net income in the analyzed period.	Dechow e Dichev (2002); Demerjian, Lev, Lewis e McVay (2013)
Debt (DEB_{it})	Total company debt: $\frac{Current\ liabilities_{it} + Non - current\ liabilities_{it}}{Total\ Assets_{it}}$	Coelho e Lopes (2007); González e García-Meca (2014)
Return on assets (ROA)	Return on lagged company assets: $\frac{Net\ profit_{it}}{Total\ Assets}$	Schuster e Klann (2019); Cupertino, Martinez e Costa Jr. (2016)
Cash flow (OCF)	Operating cash flow: $\frac{Operating\ cash\ flow_{it}}{Total\ Assets_{it}}$	Almeida e Bezerra (2012)

Legend: S: sales. Source: Research data.

The presence of more stable and predictable operations, greater diversification, and less operational volatility, in larger companies, leads to less use of accounting estimates and forecast errors (Dechow & Dichev, 2002; Hibrar & Nichols, 2007). Therefore, it is expected that the size of the company (SIZ_{it}) is negatively related to earnings management practices. The control over the audit variable (BF_{it}) is in line with previous studies that support higher earnings quality given the presence of audit firms that make up the Big Four group (Becker et al., 1998).

The variation in sales growth (VSG_{it}) is included in the model to control growth and possible economic shocks in company performance (Demerjian et al., 2013), situations that can impact the measurement of earnings and information quality accounting in the organizational context. The frequent presence of losses in financial reports can negatively impact the quality of information (Dechow & Dichev,

2002). Along these lines, the loss proportion variable (LOR_{it}) aims to control the impact of business decisions in order to the negative impacts of the presence of losses on the company's operating environment (Dechow & Dichev, 2002).

Also, the indebtedness control variable (DEB_{it}) was inserted in the model, since indebted companies are more likely to choose accounting methods that cause increases in reported earnings (Iudícibus & Lopes, 2004). The lagged profitability variable (ROA_{it}) was also inserted, as for Schuster and Klann (2019), companies with higher profitability (ROA) are associated with greater earnings management practices. Finally, the operating cash flow variable (OCF_{it}) was inserted because, according to Almeida and Bezerra (2012), there is a significant influence of operating cash flow on EM practices.

3.3 Empirical Model

The main analysis of the study, to test the research hypotheses, follows the operationalization of Equation 6, through TOBIT regressions. All variables were winsorized at a level of 1% before the operationalization of the models.

$$EM_{it} = \alpha_0 + \beta_1 MA_{it} + \beta_2 SIZ_{it} + \beta_3 BF_{it} + \beta_4 VSG_{it} + \beta_5 LOR_{it} + \beta_6 DEB_{it} + \beta_7 ROA_{it} + \beta_8 OCF_{it} + \sum effect_fixed_year_t + \sum effect_fixed_sector_t + \varepsilon_{it} \quad \text{Equation 6}$$

Where:

EM_{it} = earnings management variable of the company i in period t , alternating between proxy for discretionary accruals; EM proxy by discretionary expenses, production costs, operating cash, flow and aggregate measure of EM by actual activities;

MA_{it} = managerial ability score of company i in period t ;

SIZ_{it} = size of company i in period t ;

BF_{it} = proxy for the quality of the company's external audit;

VSG_{it} = sales growth of company i in period t ;

LOR_{it} = proportion of losses of company i in period t ;

DEB_{it} = indebtedness of company i in period t ;

ROA_{it} = Return on assets of a company i in period $t-1$;

OCF_{it} = Operating cash flow of company i in period t ;

ε_{it} = regression error.

Then, the test was carried out to evaluate earnings management by quintile for managerial ability, according to Equation 7.

$$GR_{it} = \alpha_0 + \beta_1 MA_Rank_{it} + \beta_2 SIZ_{it} + \beta_3 BF_{it} + \beta_4 VSG_{it} + \beta_5 LOR_{it} + \beta_6 DEB_{it} + \beta_7 ROA_{it} + \beta_8 OCF_{it} + \sum effect_fixed_year_t + \sum effect_fixed_sector_t + \varepsilon_{it} \quad \text{Equation 7}$$

Where:

MA_Rank_{it} = managerial ability score by quintile of a company i in period t .

The residue generated by the operationalization of the model by Kothari et al. (2005) consists of the measure of EM. As the objective of the study is not to understand the EM performed to increase or decrease the results, the residual values were considered in absolute terms.

Sensitivity tests were also carried out to demonstrate the robustness of the results found. The test consisted of evaluating EM by discretionary accruals, separating the group of positive and negative accruals, based on the conception that such EM practice can be applied both to increase and to reduce reported profits. The endogeneity test was also performed, based on 2SLS regression, using the sector's average managerial ability as an instrument. The relationship between MA and EM with the lagged managerial ability variable was also tested.

4 Presentation and Analysis of Results

Table 3 presents the descriptive statistics of the managerial ability score, and in Panel A the results encompass the total sample and, in Panel B, there was segregation by economic sectors. The managerial ability score, as it is the efficiency value generated by the DEA, represents values between 0 and 1.

Table 3

Descriptive Statistics of Business Efficiency

	Obs.	Average	σ	25%	Median	75%
Panel A: Company Efficiency Score						
EF _{it}	1.314	0.536	0.163	0.434	0.497	0.605
Panel B: Company efficiency score by sector						
Basic Consumption	126	0.464	0.202	0.292	0.434	0.589
Discretionary Consumption	336	0.446	0.050	0.418	0.453	0.475
Health care	42	0.427	0.067	0.383	0.418	0.475
Energy	36	0.433	0.242	0.293	0.346	0.411
Real Estate and Lease	90	0.655	0.278	0.430	0.576	1.000
Industrial	240	0.494	0.223	0.332	0.457	0.619
Materials	144	0.627	0.109	0.581	0.602	0.646
Communication Services	42	0.415	0.241	0.278	0.405	0.566
Public Utility Services	222	0.674	0.264	0.482	0.667	0.979
Information Technology	36	0.359	0.099	0.292	0.361	0.412

Note: number of observations. σ : standard deviation. EF: Company Efficiency Generated by DEA. Source: Research data.

The data presented in Panel A demonstrate that the value of the general average of managerial ability is 0.536. It can be seen in Panel B (Table 3) that the sector with the highest average of managerial ability is public utility services (0.674), followed by the real estate and rental sector (0.655). This indicates that such sectors have managers with greater traits of managerial ability. In turn, the information technology sector has managers with lower managerial ability (0.359).

Table 4 presents the descriptive analysis of the dependent variables (AEM and REM), the independent variable of interest (MA), and the control variables analyzed in the study.

Table 4

Descriptive Statistics of the Research Variables

Variáveis	Média	σ	Mínimo	Máximo	25%	75%
AEM	0.077	0.083	0.001	0.523	0.022	0.101
AEM pos.	0.074	0.087	0.000	1.023	0.024	0.096
AEM neg.	-0.086	0.117	-1.448	-0.000	-0.109	-0.022
REM	-0.003	0.194	-0.641	0.449	-0.092	0.119
MA	-0.016	0.209	-0.416	0.524	-0.169	0.118
MA_Rank	2.907	1.410	1	5	2	4
SIZ	21.71	1.79	17.37	25.87	20.51	22.90
VSG	-0.016	0.507	-2.52	2.23	-0.136	0.115
LOR	0.327	0.335	0.000	1.000	0.000	0.500
DEB	0.392	0.451	0.000	2.955	0.034	0.578
ROA	0.046	0.146	-1.869	0.958	0.007	0.093
OCF	0.033	0.096	-0.344	1.690	-0.000	0.062

σ : standard deviation. AEM: Earnings Management by Discretionary Accruals; REM: Earnings Management by Real Activities. MA: Managerial Ability. SIZ: Size. BF: Companies Audited by Big Four firms. VSG: Sales Growth of Company. LOR: Proportion of Losses. DEB: Indebtedness. ROA: Return on Assets. OCF: Operating Cash Flow. Source: Research data.

As shown in Table 4, it can be seen that the managerial ability has a standard deviation of (0.209), above the average. The AEM with positive and negative accruals and the REM presented positive and negative means of 0.077 and -0.003, respectively. The average of management by real activities is in line with the study by Huang and Sun (2017), suggesting that, on average, companies are not involved in abnormal operational practices. Concerning management by accruals, the positive average is indicative that, on average, the companies in the sample use this EM practice to increase their reported profits.

Regarding the control variables, the average growth of companies was -1.6%, showing, in general, a drop in sales variation. The indebtedness of the sample presented an average of 39%, similar to the studies by Jorge and Armada (2001) (52%), Teixeira et al. (2011) (30%), Costa et al. (2018) (31%) and Bernardo et al. (2018) (52%). About operating cash flow, a positive average can be seen in the companies analyzed in the study.

Then, in Table 5, the correlation matrix between the variables analyzed in the study is shown. There is a negative correlation between the AEM and the SIZ (-0.15) and BF (-0.07), and a positive correlation with the REM (0.08), LOR (0.20), and DEB (0.51). In this case, the high correlation between AEM and DEB stands out, which is in line with the indebtedness hypothesis of Watts and Zimmerman (1978). REM is positively related to SIZE (0.07) and LOR (0.22) and negatively correlated to BF (-0.08) and ROA (-0.17). Managerial ability is positively related to AEM (0.06) and REM (0.20), in addition to the ROA control variable (0.13), and negatively related to BF (-0.06) and DEB (-0.07).

In general, the data in Table 5 demonstrate that there is no high correlation between the independent

variables analyzed, which allows us to rule out possible multicollinearity problems in the regression models below.

Table 5
Correlation Matrix

Var.	AEM	REM	MA	SIZ	BF	VSG	LOR	DEB	ROA	OCF
AEM	1.00									
REM	0.08**	1.00								
MA	0.06**	0.20***	1.00							
SIZ	-0.15***	0.07**	-0.01	1.00						
BF	-0.07***	-0.08***	-0.06**	0.38***	1.00					
VSG	0.06**	0.02	0.03	0.01	0.00	1.00				
LOR	0.20***	0.22***	-0.05	-0.26***	-0.25***	-0.03	1.00			
DEB	0.51**	0.03	-0.07**	0.08	-0.07***	-0.02	-0.03	1.00		
ROA	-0.22***	-0.17***	0.06**	0.13***	0.11***	-0.06**	-0.29***	0.01	1.00	
OCF	-0.06	-0.24	0.00	0.00	0.01	-0.06**	-0.06**	-0.01	0.02	1.00

Significance levels: * p<0.1, ** p<0.05, *** p<0.01. AEM: Earnings Management by Discretionary Accruals. REM: Earnings Management by Real Activities. MA: Managerial Ability. SIZ: Size. BF: Companies Audited by Big Four Firms. VSG: sales growth of company. LOR: Proportion of Losses. DEB: Indebtedness. ROA: Return on Assets. OCF: Operating Cash Flow. Source: Research data.

Table 6 presents the regressions to verify the influence of managerial ability on AEM and REM, according to Equation 6, and managerial ability measured by quintile, according to Equation 7. In Table 6, the TOBIT method was used for the regression models. Durbin-Watson tests do not reveal autocorrelation problems (statistic close to 2.0 in all regressions). Furthermore, multicollinearity is not an issue in any of the regressions tested in the research.

Table 6
Management Ability and Management of earnings management

Panel A: Management ability and GR					
Variables	Expected Signal	AEM (Model 1)		REM (Model 2)	
		Coefficient	t test	Coefficient	t test
Constant	+/-	0.298***	7.55	-0.383***	-5.30
MA	-	0.049***	4.09	0.178***	8.38
SIZ	-	-0.008***	-5.42	0.014***	4.89
BF	-	-0.005	0.96	-0.005	-0.57
VSG	+	0.000***	5.09	0.000	0.19
LOR	+	0.035***	5.22	0.128***	8.98
DEB	+	0.001*	2.08	0.002*	1.71
ROA	-	-0.116***	-6.49	-0.159***	-5.04
OCF	-	-0.031	-1.22	-0.676***	-12.40
Fixed Effects Sector and Year		Yes		Yes	
Adjusted R ²		0.1250		0.093	
VIF		1.02 a 1.48		1.02 a 1.48	
DW		2.04		2.00	
N		1.314		1.314	
Panel B: Management ability by Quintile (MA_Rank) and GR					
Variables	Expected Signal	AEM (Model 1)		REM (Model 2)	
		Coefficient	t test	Coefficient	t test
Constant	+/-	0.242***	5.98	-0.538***	-6.20
MA_Rank	-	0.017**	2.96	0.088***	7.01
SIZ	-	-0.007***	-4.47	0.021***	6.25
BF	-	0.008	1.45	-0.036	-3.07
VSG	+	0.000***	5.18	0.000	0.66
LOR	+	0.038***	4.71	0.128***	7.41
DEB	+	0.001**	2.15	0.000	0.11
ROA	-	-0.114***	-6.37	-0.200***	-5.21
OCF	-	-0.033	-1.26	-0.520***	-9.22
Fixed Effects Sector and Year		Yes		Yes	
Adjusted R ²		0.1205		0.058	
VIF		1.02 a 1.48		1.02 a 1.48	
DW		2.03		2.01	
N		1.314		1.314	

Significance levels: * p<0.1, ** p<0.05, *** p<0.01. AEM: Earnings Management by Discretionary Accruals. REM: Earnings Management by Real Activities. MA: Managerial Ability. MA_Rank: Managerial Ability by quintile. SIZ: Size. BF: Companies Audited by Big Four firms. VSG: Sales Growth of Company. LOR: Proportion of Losses. DEB: Indebtedness. ROA: Return on Assets. OCF: Operating Cash Flow. EF: Fixed Effect. VIF: Variance Inflation Factor. DW: Durbin Watson. N: Number of Observations. Source: Research Data.

In Models 1 and 2, the dependent variable is earnings management proxies (AEM and REM), and the independent variable of interest is managerial ability. The estimates of earnings management with manager ability are significant and positive in both models. The coefficients in Models (1) and (2) are (0.049; $p < 0.01$) and (0.178; $p < 0.01$), respectively. As the high index of AEM and REM imply greater practices of EM, the regression coefficients indicate that managerial ability is related to greater practices of EM, contrary to the research hypotheses H_1 and H_2 .

The rejection of research hypotheses can be justified by some specific factors. About AEM, Hasah (2018) argues that due to the prospect of increased remuneration, managers with greater skills may overestimate their benefits from actions that exacerbate agency problems and the accounting information environment. Furthermore, Demerjian et al. (2017) demonstrated that skilled managers are more likely to engage in intentional income smoothing, reducing the quality of accounting information, to benefit shareholders. Baik et al. (2019) identified that highly skilled managers incorporate more forward-looking information about cash flow into current earnings through income smoothing, in order to earnings quality.

As for the positive relationship between REM and managerial ability of managers, given the high reputation cost of high-skill managers, they may face pressure if they miss earnings benchmarks. In that case, more talented managers can engage in REM. In addition, these managers have superior knowledge of their companies' operating environment (Demerjian et al., 2013), which allows them to align REM with their reporting strategies.

In this perspective, high managerial ability, in addition to being able to produce good company performance, may be better able to extract personal gains from it. This provides managers with incentives to reduce the quality of accounting information and increase the use of earnings management practices (Hasah, 2018), in this study perceived by the practice of AEM and REM.

As far as the economic analysis is concerned, an increase of one standard deviation of MA_Rank (1.41) is related to a 31.12% increase ($1.41 \times 0.017 / 0.077$) in AEM compared to the mean. Likewise, a one standard deviation increase in MA_Rank (1.41) impacts a 4,136% increase ($1.41 \times 0.088 / 0.003$) in REM. There is, therefore, a more significant effect, from an economic point of view, of MA on REM, which allows us to say that skilled managers prefer this type of management. However, it should be noted that the high percentage (4,136%) is also due to the very low average of the REM (-0.003). The 31.12% increase in AEM can also be considered significant from an economic point of view. Still, in economic terms, the increase of one standard deviation of MA implies an increase of 10.73% ($0.038 \times 0.209 / 0.074$) in positive accruals about the mean, and 11.17% ($0.046 \times 0.209 / 0.086$) in negative accruals in relation to the mean.

The regression results for models (1) and (2) demonstrate that the coefficients for most control variables have the predicted signs and statistical significance. As demonstrated in a previous study (Li, 2018), company size is related to EM, however, in this study, a negative relationship was found with AEM (-0.008; $p < 0.00$) and a positive relationship with REM (0.014; $p < 0.00$). This implies that larger companies tend to adopt more REM practices than smaller companies, possibly because such companies are exposed to greater scrutiny from regulatory, supervisory and internal control bodies, which could inhibit the use of AEM.

Also, regarding the control variables, it was found that indebtedness has a positive relationship in Models (1) and (2). Regarding the cash flow variable (OCF), it has a negative relationship with the REM (-0.676; $p < 0.01$). In models (1) and (2), the LOR coefficients (0.035; $p < 0.01$ and 0.128 $p < 0.01$) indicate that companies with higher proportions of losses are more likely to engage in EM practices through accruals and real activities.

4.1 Sensitivity Tests

The first sensitivity test consisted of separating positive and negative discretionary accruals, in line with the assumption that AEM can be used both to decrease and increase reported earnings. The results are shown in Table 7.

As shown in Table 7, the relationship between AEM and managerial ability is positive for positive accruals (0.038; $p < 0.01$). Furthermore, about the economic analysis of Panel B, it is suggested that an increase of one quintile in managerial ability is related to an increase in the positive AEM index by 13%.

The literature understands that EM by accruals can be used to manage profits up or down. The evidence in Table 7 demonstrates that the use of AEM by the most skilled managers is mostly aimed at increasing reported profits, due to the statistical significance of positive accruals and lack of significance of negative accruals.

One explanation for the MA coefficient being positive for both positive and negative accruals is that managerial ability can be an incentive or can contribute to the manager managing earnings in the direction he needs or is encouraged to do so. For example, management may aim to decrease profit to pay fewer taxes, dividends, or smooth, or even increase profit to meet bonus targets.

Table 7

Management Ability and AEM – no treatment per module

Panel A: Management Ability and EM					
Variables	Expected Signal	AEM (Positive Accruals)		AEM (Negative Accruals)	
		Coef.	t test	Coef.	t test
Cons.	+/-	0.157***	3.37	0.327***	4.92
MA	-	0.038***	2.93	0.046	2.37
SIZ	-	-0.002	-1.46	0.010***	3.98
BF	-	0.003	0.53	-0.003	-0.46
VSG	+	0.001***	6.70	-0.000	0.50
LOR	+	0.021**	2.08	-0.070***	-6.00
DEB	+	0.001	1.15	-0.002**	-2.44
ROA	-	-0.141***	-7.61	0.098***	3.90
OCF	-	-0.365***	-10.64	-0.176***	4.81
Fixed Effects Sector and Year		Yes		Yes	
Adjusted R ²		0.2086		0.1853	
VIF		1.02 a 1.68		1.03 a 2.86	
DW		1.96		2.17	
N		687		627	

Panel B: Management Ability by Quintile (MA_Rank) and EM					
Variables	Expected Signal	AEM (Positive Accruals)		AEM (Negative Accruals)	
		Coef.	t test	Coef.	t test
Cons.	+/-	0.149***	3.18	0.216***	3.21
MA_Rank	-	0.013**	2.07	0.017	1.88
SIZ	-	-0.002	-1.35	0.007***	2.98
BF	-	-0.003	-0.54	-0.008	-0.97
VSG	+	0.001***	6.70	-0.000	-0.78
LOR	+	-0.023**	-2.21	-0.069***	-5.88
DEB	+	0.001	1.19	-0.003**	-2.48
ROA	-	-0.1411***	-7.53	0.095***	3.77
OCF	-	-0.322***	-10.73	-0.195***	-4.86
Fixed Effects Sector and Year		Yes		Yes	
Adjusted R ²		0.2086		0.2338	
VIF		1.02 a 1.69		1.06 a 1.40	
DW		1.98		2.16	
N		687		627	

Significance levels: * p<0.1, ** p<0.05, *** p<0.01. AEM: Earnings Management by Discretionary Accruals. MA: Managerial Ability. MA_Rank: Managerial Ability by quintile. SIZ: Size. BF: Companies Audited by Big Four firms. VSG: Sales Growth of Company. LOR: Proportion of Losses. DEB: Indebtedness. ROA: Return on Assets. OCF: Operating Cash Flow. EF: Fixed effect. VIF: Variance Inflation Factor. DW: Durbin Watson. N: Number of Observations. Source: Research data.

Then, the endogeneity test was carried out, using 2SLS regression, using the sector's average managerial ability as an instrument. The results of the non-tabulated Durbin-Watson (1.989; p = 0.1584) and Wu-Hausman (1.9789; p = 0.1597) tests indicate that the variable MA is exogenous. Then, the addition of the variable MA lagged in a period was considered, as shown in Table 8, to verify whether the effect of MA varies as a function of time. For this test, the model by Kothari et al. (2005) was adapted, including a variable of total accruals from the previous year.

Table 8

Management Ability and Earnings Management – Endogeneity Testing

Panel A: Management Ability and EM									
lagged MA									
Variables	SP	AEM (Positive Accruals)		AEM (Negative Accruals)		AEM (Absolute)		REM	
		Coef.	t test	Coef.	t test	Coef.	t test	Coef.	t test
Cons.	+/-	0.136**	3.08	-0.225***	-3.37	0.295***	7.55	-0.495***	-5.68
MA	-	0.043**	3.33	0.054**	3.04	0.039**	3.45	0.149***	6.00
SIZ	-	-0.000	-1.22	0.007**	3.10	-0.008***	-5.50	0.020***	5.74
BF	-	0.002	0.37	-0.009	-1.08	0.003	0.61	-0.038**	-3.19
VSG	+	0.001***	6.94	-0.000	-0.80	0.000***	5.39	0.000	0.88
LOR	+	-0.017*	-1.73	-0.068***	-5.87	0.344***	4.89	0.119***	7.36
DEB	+	0.001	1.26	-0.002**	-2.37	0.001*	0.027	0.000	0.01
ROA	-	-0.148***	-7.82	0.102***	4.04	-0.119***	-6.70	-0.186***	-5.52
OCF	-	-0.340***	-10.02	-0.192***	-4.80	-0.019	-0.76	-0.514***	-9.01
FE year and sector		Yes		Yes		Yes		Yes	
Adjusted R ²		0.2078		0.1865		0.1254		0.065	
VIF		1.01 a 1.59		1.03 a 1.49		1.01 a 1.48		1.01 a 1.48	
DW		2.06		2.06		1.98		1.97	
N		687		627		1.314		1.314	

Panel B: Management Ability by Quintile (MA_Rank) and GR lagged MA_Rank									
Variables	PS	AEM (Positive Accruals)		AEM (Negative Accruals)		AEM (Absolute)		REM	
		Coef.	t test	Coef.	t test	Coef.	t test	Coef.	t test
Cons.	+/-	0.152***	3.30	-0.215***	-3.10	0.239***	5.93	-0.582***	-6.69
MA_Rank	-	0.000*	0.05	0.003	1.33	0.002*	1.46	0.028***	7.63
SIZ	-	-0.000	-1.49	0.007**	3.09	-0.007***	-4.69	0.019***	5.67
BF	-	0.001	0.24	-0.009	-1.09	0.007	1.34	-0.033**	-2.81
VSG	+	0.012***	7.05	-0.000	-0.75	0.000***	5.32	0.000	1.01
LOR	+	-0.019*	-1.89	-0.069***	-5.87	0.039***	4.95	0.134***	7.75
DEB	+	0.001	1.35	-0.002**	-2.40	0.001**	2.26	0.000	0.04
ROA	-	-0.140***	-7.61	0.097***	3.81	-0.115***	-6.44	-0.224***	-5.80
OCF	-	-0.347***	-10.21	-0.179***	-4.94	-0.020	-0.78	-0.509***	-8.99
FE year and sector		Yes		Yes		Yes		Yes	
Adjusted R ²		0.2007		0.096		0.1209		0.071	
VIF		1.02 a 1.54		1.05 a 2.86		1.01 a 1.49		1.01 a 1.49	
DW		2.06		2.04		1.98		1.97	
N		687		627		1.314		1.314	

The 2SLS model was estimated for endogeneity, the results showed that the mean instrumental variable of the MA by sector and year presented a negative and statistically significant sign at a significance level of 1%. AEM: Earnings Management by Discretionary Accruals. MA: Managerial Ability. MA_Rank: Managerial Ability by quintile. SIZ: Size. BF: Companies Audited by Big Four Firms. VSG: Sales Growth of Company. LOR: Proportion of Losses. DEB: Indebtedness. ROA: Return on Assets. OCF: Operating Cash Flow. PS: Predicted Signal. FE: Fixed effect. VIF: Variance Inflation Factor. DW: Durbin Watson. N: Number of Observations. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. Source: Research data.

The results in Table 8 demonstrate that there is a relationship between past management ability and earnings management practices (AEM and REM), which confirms the results of the main analysis presented in Table 6. In general, the tests for effects on EM are consistent for MA and MA_Rank, when analyzing lagged managerial ability.

As proposed by Baik et al. (2019), the measure of managerial ability has weaknesses, because managerial ability is unobservable and, therefore, difficult to measure. However, the measure by Demerjian et al. (2013) has been used extensively as a proxy for managerial ability. This is because this measure effectively separates the managerial effect from the company effect. Furthermore, it is suitable for large sample analyzes and is not restricted to companies that change managers (Bertrand & Schoar, 2003). Third, this measure captures the overall ability of the management team and is therefore not limited to the skill (talent) of the CEO alone.

5 Final Considerations

The study aimed to verify the relationship between managerial ability and the level of earnings management by accruals and by real activities in a sample of Brazilian companies. Managerial ability was analyzed from the perspective of Demerjian et al. (2013), in which more skilled managers maximize the efficiency of the resources used by the company, that is, the managerial ability was analyzed based on company information.

In general, the results demonstrate that managerial ability is positively related to earnings management, when evaluated without considering its sign, that is, without considering whether the EM is to increase or reduce profits. With this, it is concluded that managers, theoretically more skilled, would have a greater incentive to manage profits.

When deepening this analysis, through sensitivity tests, by separating positive and negative accruals, it was identified that this positive relationship was only confirmed when the EM aims to increase profits. Thus, it is concluded that more skilled managers may have more incentives related to bonus plans or covenant clauses, for example, which would lead them to manage earnings upwards, not observing the same behavior for the reduction of reported earnings.

An issue that deserves to be highlighted regarding the findings is that they may be subject to endogenous problems, since when the MA variable lagged, the results were not significant, except for the EM for real activities. Therefore, the results and conclusions of the present study must be analyzed sparingly.

Therefore, it is concluded that the managerial ability of the management team is only related to the EM by accruals that occurred in the same period. Furthermore, it seems to have a more immediate effect, not influencing EM practices from other periods. Managerial ability only has a long-term effect when it comes to EM for real activities.

The study contributes to the growing literature on earnings management and managerial ability. Previous studies have demonstrated relationships between managerial ability and information quality, such as earnings persistence (Demerjian et al., 2013), and earnings smoothing (Demerjian et al., 2017; Baik et al., 2019), and REM (Huang & Sun, 2017). This study extends this literature, demonstrating that managerial ability can affect REM and AEM practices. The results of this study are in agreement with those found by Demerjian et al. (2017), but they differ from what was observed by Demerjian et al. (2013).

Some limitations are inherent to the study. Although the findings indicate robust evidence that managerial ability is related to EM, this relationship may be caused, in part, by the complexity of the company and the hiring of talented managers capable of working in the complexity of the environment. Thus, it can be argued that EM can be a natural result, not of the manager, but the choice of the management team by the selections of the companies. Another limitation concerns the way MA was measured, based on the company's observable results and not exactly on the manager's characteristics. In this way, managerial ability is related to managers' decisions about the allocation of the entity's resources.

Thus, studies with more qualitative characteristics are suggested, which can analyze in more depth, perhaps through case studies, this relationship between managerial ability and earnings management practices. This type of analysis would also help to resolve possible doubts regarding the MA metric proposed by Demerjian et al. (2013) and used in this study.

In addition, throughout the study, the relationship between managerial ability and EM was emphasized. A causal relationship between them could strengthen the study's inferences. While the use of fixed effects may alleviate some of the concerns, it remains difficult to draw causal inferences. Therefore, the results of this study should be interpreted with caution. Despite these limitations, the findings provide important information about the determinants of EM, mainly arising from management characteristics.

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