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Earnings Management and the Corporate Life Cycle: The Moderating Role of Managerial Ability

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Abstract

Objective: This article investigates the moderating effect of managerial ability on the relationship between the corporate life-cycle stage and earnings management.
Method: To assess managerial ability, we adopted the model proposed by Demerjian et al. (2013), and earnings management was examined using the Kothari et al. (2005) model. The classification of corporate life cycle stages - introduction, growth, maturity, and decline – followed the methodology of Dickinson (2011). Accordingly, a descriptive and documentary study with a quantitative approach was conducted, using statistical methods such as correlation analysis and OLS regression. The database covered the period from 2011 to 2020 and comprised a sample of 205 firms that provided complete information for the variables analyzed.
Results or Discussion: The results showed a positive and significant relationship between the corporate life cycle stages - introduction and decline - and earnings management. In addition, managerial ability strengthens this relationship in both stages, indicating that more capable managers are more likely to intensify earnings management practices during these phases. In contrast, the opposite is observed for the growth and maturity stages. Overall, the findings suggest that earnings management practices vary according to both the company's life-cycle stage and the manager's ability.
Contribution: This study provides evidence that managerial ability influences earnings management practices across the different stages of the corporate life cycle. In this way, it deepens understanding of how internal characteristics (managerial ability) interact with contextual variables (life cycle) to affect accounting decisions. Furthermore, the results indicate that the effect of managerial ability varies across life-cycle stages, suggesting that organizational behavior is not homogeneous over time. This suggests that decisions regarding accounting practices are shaped by both the manager's ability and the company's life-cycle stage.

Keywords: Managerial Ability; Earnings Management; Life Cycle Stages.

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Introduction

Accounting earnings are among the most widely used performance measures and are a key element in analyses conducted by external stakeholders (Hong & Andersen, 2011). Given this relevance, managers may adjust earnings without violating accounting standards, exploiting the discretion allowed to disclose information in ways that serve their interests (Gargouri et al., 2010). In this context, Watts and Zimmerman (1978) note that such discretion facilitates earnings management (EM).

Although regulated, accounting information is subject to a degree of flexibility permitted by standards, enabling managers to adopt different measurement and recognition practices to achieve specific objectives. This possibility is associated with earnings management (Dechow et al., 2010). According to Paulo (2007), such management occurs without violating accounting standards and can be influenced by the company's economic and financial situation at the time its financial statements are disclosed.

In addition to managerial discretion, the corporate life cycle may influence the quality of reported numbers. This can occur because, depending on the company's life-cycle stage, strategies and decision-making may change (Lester et al., 2003; Ribeiro et al., 2024; Xie et al., 2022). As organizational behavior evolves across different life-cycle stages, it is reasonable to assume that their accounting reporting behavior also changes (Abdullah & Mohd-Saleh, 2014).

The life cycle theory posits that companies evolve through distinct stages over time. These stages can have significant effects on organizational outcomes. Life-cycle stages may exert considerable influence on marketing aspects, as well as on investment and financing strategies. Drake (2013), for example, shows that variations in sales revenue, return on assets, cash flows, and earnings persistence differ across organizational life cycle stages. Xie et al. (2022) indicate that companies adopt different earnings management practices across life-cycle stages and that these preferences differ between family and non-family firms, given the managerial characteristics of each type of company.

Dickinson (2011) highlights that, across different life-cycle stages, companies exhibit distinct financial characteristics and require different management competencies, priorities, and strategies. In the initial stage, for example, a company needs to maximize revenue growth to create cost advantages over competitors, as reflected in particular cash flow patterns; this logic also applies to the decline stage. In the growth and maturity stages, the company typically has positive cash flow from operating activities (Dickinson, 2011). These aspects suggest that companies in the introduction and decline stages are more likely to engage in earnings management practices, unlike those in the growth and maturity stages.

Upper echelons theory proposes that managers' individual characteristics and abilities directly influence corporate decisions and outcomes (Hambrick & Mason, 1984; Hambrick, 2007). In this regard, Demerjian et al. (2012) define managerial ability as managers' capacity to efficiently convert a company's resources into revenue relative to industry peers.

Managerial ability plays an important role in the implementation of accounting principles and the preparation of financial statements (Baik et al., 2020; García-Meca & García-Sánchez, 2018). Highly skilled managers tend to have a deeper understanding of financial and accounting issues (Cahyono et al., 2024; García-Meca & García-Sánchez, 2018; Gounopoulos & Pham, 2018; Simamora, 2023) and enhance the integration of management information (Putra, 2023). In this regard, such evidence suggests that the extent of earnings management across life-cycle stages may be either maximized or minimized, depending on managerial ability.

Previous literature indicates that earnings management should be examined within the context of the corporate life cycle (Choi et al., 2016; Cohen et al., 2010). Prior studies have incorporated corporate life cycle stages in investigations of accrual anomalies (Hribar & Yehuda, 2015; Taso et al., 2010), analyst forecasts (Taso et al., 2009), cost of capital (Hasan et al., 2015), earnings quality (Chen, 2016; Chen et al., 2010; Srivastava, 2014), and real earnings management practices (Xie et al., 2022). However, these studies did not examine how managerial ability influences the relationship between life-cycle stages and earnings management. In light of this, the objective of the present study was to investigate the moderating effect of managerial ability on this relationship.

Existing literature shows that the corporate life cycle is an essential factor in many areas of accounting research. According to Srivastava (2014), young firms tend to exhibit lower earnings quality compared to more experienced firms. Choi et al. (2016) indicate that firms in the introduction stage show greater motivation to manage earnings than those in the maturity stage. A deeper analysis of the role of life-cycle stages in financial reporting and earnings quality can help clarify the divergent results identified in prior studies.

The present study contributes to the literature on managerial ability and earnings management across different stages of the corporate life cycle. In much prior research, earnings management practices are asso

ciated with firm-level characteristics and do not account for the potential influence of individual managerial characteristics. Hasan and Cheung (2018) and Bamber et al. (2010) emphasize the importance of assessing how individual idiosyncrasies affect financial reporting.

This study also expands the understanding of how different corporate life-cycle stages affect the quality of accounting information in the Brazilian context by examining earnings management behavior across these stages. The findings provide evidence that the life cycle influences the quality of accounting information, offering relevant insights for investors and regulatory authorities in evaluating and monitoring companies.

The results of this research enable stakeholders to evaluate managerial performance, taking into account technical and organizational capabilities, particularly in transitional contexts across different stages of the corporate life cycle. The analysis of managerial ability as a moderating factor that can either mitigate or amplify earnings management can also be applied in executive evaluation and/or selection processes.

By highlighting how managerial ability affects earnings management practices, the study underscores the need for governance mechanisms that promote greater transparency in accounting information. Furthermore, the findings can serve as a resource for educational institutions, consulting firms, and training programs to develop content aligned with the real demands of business practice.

2 Background and Research Hypotheses

According to life cycle theory, companies evolve through distinct stages (Dickinson, 2011). Across these stages, firms exhibit distinct financial characteristics that require different management competencies, priorities, and strategies. Generally, organizations can be classified into the introduction, growth, maturity, turbulence, and decline stages. Accordingly, companies at different life-cycle stages face distinct challenges and incentives (Ames et al., 2020).

Habib and Hasan (2019) suggest that the corporate life cycle exerts considerable effects on financial reporting and corporate disclosures. In addition to managerial discretion, life-cycle stages may also influence the quality of reported accounting information. In this regard, Almeida and Kale (2024) provide evidence that accounting accruals, a proxy for a firm'saccounting quality, vary according to changes in the operating environment throughout the corporate life cycle. Similarly, Krishnan et al. (2021) observe lower-quality financial reporting practices during the introduction, growth, and decline stages than during the maturity stage.

In general, companies in the introduction stage face substantial uncertainty regarding potential revenues and costs (Jovanovic, 1982). At this stage, firms are still developing organizational practices, processes, systems, structures, capabilities, and employee skills (Pérez et al., 2004). Initial endowments, such as financial resources and technological or managerial capacity, may act as barriers to implementing robust accounting systems and internal controls (Doyle et al., 2007; Krishnan et al., 2021). Furthermore, companies in the growth stage typically develop more complex organizational structures, and emphasize innovation, growth, and diversification (Dickinson, 2011), which complicates the creation and maintenance of effective accounting information systems (Ashbaugh-Skaife et al., 2007; Doyle et al., 2007). Almand et al. (2023) show that companies in the introduction stage are often identified as earnings manipulators.

Revenue generation, profitability, and cash flows are typically uncertain during the introduction stage. During this period, companies face challenges associated with novelty and a higher likelihood of exiting the market (Hasan & Habib, 2017). This situation, combined with simpler and more informal operational structures and the pursuit of new investments, may reduce the transparency and reliability of accounting reporting (Mueller, 1972).

Companies in the introduction stage focus on securing external financing to expand operations, fund capital expenditures, and scale their activities (Dickinson, 2011). Moreover, they may shift attention from uncertain current operations toward future growth. Firms in the introduction stage typically face a higher cost of equity (Hasan et al., 2015), and experience difficulties in attracting investor and analyst attention due to their relatively small size. These financing needs, combined with higher capital costs, may incentivize managers to adopt more optimistic financial disclosures to appeal to potential investors. Additionally, due to a greater propensity to take risks in expanding resources and operations (Habib & Hasan, 2019), such companies may engage in earnings management practices (Ribeiro et al., 2024).

On the other hand, companies in the growth and maturity stages may have incentives to produce more comparable and transparent financial statements, as they face lower information asymmetry and have easier access to financing (Dickinson, 2011). These companies also have more sophisticated accounting systems and stronger internal controls, which enhance the accuracy of accounting estimates and contribute to higher-quality financial information (Hasan & Cheung, 2018).

Companies in the decline stage are characterized by

very low or negative profit margins, reduced operational efficiency, and underutilization of productive capacity (Dickinson, 2011). According to Hasan and Cheung (2018), these factors increase the likelihood of market exit due to internal inefficiencies and gradual deterioration of technologies, products, and managerial strategies. Additionally, companies in decline face a higher risk (Habib & Hasan, 2019; Hasan et al., 2015; Hasan & Habib, 2017). As a result, they are more likely to produce lower-quality financial statements (Krishnan et al., 2021).

Consistent with this view, Xie et al. (2022) show that firms in the decline stage are more likely to engage in earnings management than mature firms. This stage is characterized by lower investment, reduced liquidity, limited issuance of debt and equity, limited analyst coverage, and higher capital costs (Dickinson, 2011; Hansen et al., 2018; Hasan et al., 2015). Furthermore, products begin to lose market strength, and sales become difficult to sustain, requiring resource conservation through reduced investment in innovation and price reductions (Miller & Friesen, 1984). Consequently, declining firms may manage earnings to temporarily improve results by cutting discretionary expenditures such as advertising and research and development (R&D), increasing sales through discounts, and selling long-term assets (Jaggi et al., 2022). According to Cohen et al. (2010), this phase is characterized by high accounting flexibility and low detection costs, largely due to reduced analyst monitoring and ownership structures that facilitate earnings management.

Based on these arguments, and given the characteristics of firms in the introduction and decline stages, the first research hypothesis is formulated as follows:

H1: Earnings management is higher during the introduction and decline stages of a company's life cycle than during the growth and maturity stages.

Previous empirical evidence supports the notion that corporate life-cycle stages influence earnings management. This impact arises because life cycle stages influence various corporate aspects, such as the stock market's response to accounting information (Anthony & Ramesh, 1992); investment, financing, and cash policies (DeAngelo et al., 2006; Faff et al., 2016); risk-taking propensity (Habib & Hasan, 2017); and tax avoidance (Hasan et al., 2017). In this context, during the early stages of the life cycle, managers tend to pursue diversified strategies and actively seek opportunities that enhance the likelihood of long-term survival (Donaldson & Lorsch, 1983).

Berger and Udell (1998) suggest that firms at different life cycle stages differ in their ability to raise capital. Young firms tend to rely on private equity, whereas mature firms predominantly depend on external markets. This distinction arises because information asymmetry, combined with reputation effects, plays a central role in the choice of financing sources across life cycle stages. Specifically, firms in the introduction stage are relatively small, unknown, and less followed by analysts and investors, which increases information asymmetry (Berger & Udell, 1998) and may lead to mispricing (Myers & Majluf, 1984). In contrast, mature firms are more visible in the market, closely monitored by analysts, and therefore face lower information asymmetry and reduced capital costs (Hasan et al., 2015).

Krishnan et al. (2021) examine the effect of life cycle stages on the quality of financial reporting, using measures such as abnormal accruals, abnormal revenues, and other related indicators. The authors argue that firms in the early stages have stronger incentives to engage in earnings management than those in the mature stage, and further highlight that managerial judgment and experience in accrual estimation may vary across life-cycle stages. Their findings indicate that absolute abnormal accruals and abnormal revenues are lower in mature firms and higher in the other stages.

Similarly, Roma et al. (2020) investigate the effect of a company's life cycle stages on accrual quality. The authors document that organizations in the introduction and decline stages exhibit lower accrual quality, whereas mature firms exhibit higher accrual quality. Therefore, this literature suggests that life-cycle stages significantly affect accrual-based earnings management (Roma et al., 2020).

According to Putra et al. (2021), managerial characteristics are crucial determinants of an organization's policies and strategies, as managers are primarily responsible for leading and implementing business decisions, and organizational ability is among the most relevant attributes. Demerjian et al. (2012) argue that more skilled managers better understand technology and industry trends, more accurately forecast product demand, invest in higher-value projects, and manage their employees more efficiently than less skilled managers. Previous studies also demonstrate that managerial ability influences accounting policy and firm performance (Andreou et al., 2017; Demerjian et al., 2013; Bertrand & Schoar, 2003).

More skilled managers have a broader understanding of their firms' businesses (Demerjian et al., 2012). These authors argue that more capable managers more readily identify business opportunities, make superior decisions, and manage their firms more efficiently, thereby maximizing shareholder benefits. According to Putra (2023), managers are the primary agents in earnings management, and managerial ability may be an important factor in whether they engage in this practice.

The literature also provides evidence that highly skilled managers enhance firms' informational environments

(Cahyono et al., 2024; Baik et al., 2020; Bamber et al., 2010; Dyreng et al., 2010; Demerjian et al., 2013). Demerjian et al. (2013) show that earnings quality improves when a manager possesses high managerial ability, while Baik et al. (2020) report that firms led by highly skilled managers exhibit more predictable earnings.

In this regard, specific managerial characteristics can significantly influence a firm's financial information and disclosure choices (Hasan & Cheung, 2018) and represent important determinants of accounting decisions (Lunardi et al., 2022). Moreover, more skilled managers tend to estimate accruals more accurately (Demerjian et al., 2013). Thus, managerial ability may amplify the effect that the life cycle has on earnings management. Accordingly, the second research hypothesis is formulated as follows:

H2: Managerial ability positively moderates the relationship between the introduction and decline stages of the life cycle and earnings management.

Table 1 presents a review of the variables analyzed in the study and summarizes the main findings reported in the literature. For each variable, the table highlights the relevant authors and the predominant empirical evidence. This systematization supports ensure the theoretical consistency of the study and reinforces the connection between the constructs under investigation and the models employed in the empirical analysis.

The studies presented in Table 1 indicate that the stages of a firm's life cycle influence earnings management practices. Regarding earnings management, firms in the introduction or decline stages tend to make earnings adjustments to signal performance or maintain continuity, whereas firms in the growth and maturity stages generally exhibit lower levels of earnings management (Jaggi et al., 2022; Xie et al., 2022). Furthermore, managerial ability is a key determinant of earnings quality, as demonstrated by Demerjian et al. (2013), Baik et al. (2020), and Lunardi et al. (2022), who indicate that more skilled managers employ strategic earnings management practices with a focus on future performance.

3 Research Methods and Procedures

3.1 Population and sample

The research population comprises Brazilian firms listed on B3 – Brasil, Bolsa and Balcão, during the period from 2013 to 2020. Data were collected from Thomson Reuters Eikon®, using financial statements, including the statement of comprehensive income and the accompanying notes.

To compose the sample, firms that did not provide the necessary information to calculate the life cycle, managerial ability, and earnings management variables were excluded, as were those in the financial industry, given

Table 1. Review of Previous Research Findings

References	Life Cycle	Earnings Management	Managerial Ability
Dickinson (2011)	The study develops a proxy for the business life cycle based on cash flow patterns. The proxy reveals differences in the persistence of profitability across the life-cycle stages.		-
Demerjian et al. (2013)	-	The study demonstrates that earnings quality is positively associated with managerial ability.	
Habib e Hasan (2019)	The review indicates that the corporate life cycle influences financial reporting, investment, financing, and dividend policies, as well as corporate governance and social responsibility.		-
Baik et al. (2020)	-	The research identified managerial ability as an important determinant of accrual quality.	
Roma et al. (2020)	The results suggest that economic policy uncertainty affects earnings management practices depending on a firm's life cycle.		-
Krishnan et al. (2021)	The study provides empirical evidence that, throughout a firm's life cycle, there is considerable variation in the quality of financial reporting.		-
Putra et al. (2021)	-	Compared with non-family firms, managers in family firms with higher managerial ability tend to engage in earnings management to enhance future profits.	
Lunardi et al. (2022)	-	The findings show that managerial ability is positively associated with both accrual-based and real-activity earnings management. As a sensitivity test, it is observed that AEM use by more skilled managers is primarily intended to increase reported earnings.	
Jaggi et al. 2022	Managers tend to adjust earnings through discretionary provisions during the introduction and decline stages. In the introduction stage, this adjustment aims to signal positive performance and support future forecasts; in the decline stage, they aim to prolong the firm's survival and allow time for corrective actions. In the growth and maturity stages, negative provisions may be used to reserve earnings and smooth results in future periods of lower performance.		-
Xie et al. (2022)	Firms rely different earnings management mechanisms across the stages of the life cycle.		-
Almand et al. (2023)	Firms in the introduction, turnaround, and decline stages are more frequently identified as manipulators, while firms in the growth and mature stages are less frequently identified as manipulators.		-
Ribeiro et al. (2024)	The findings highlight a trade-off between accrual-based and real activities earnings management, influenced by the firm's life-cycle stage.		-
Almeida e Kale (2024)	The study investigates the relationship between a firm's life-cycle stages and accrual quality (AQ), identifying an inverted-U-shaped pattern: mature firms exhibit the highest AQ, whereas firms in the introduction and decline stages exhibit the lowest. AQ tends to deteriorate when firms enter the decline stage or move from maturity to subsequent stages.		-

Source: Prepared by the authors

their distinct characteristics relative to other industries. Accordingly, the final sample of the study comprised 205 firms, which are presented by economic sector in Table 2.

Table 2. Research Sample by Economic Industry

Sectors – GICS Sector Name	Companies	%
Basic Consumption	19	9.27
Discretionary Consumption	53	25.85
Healthcare	8	3.90
Energy	9	4.39
Real Estate and Rentals	15	7.32
Industrial	38	18.54
Materials	23	11.22
Communication Services	5	2.44
Public Utility Services	30	14.63
Information Technology	5	2.44
Total	205	100
Number of observations	2.050	

Note: GICS: Global Industry Classification Standard.

Source: Research data.

3.2 Variable Definitions

3.2.1 Managerial Ability

To estimate managerial ability, this study uses the MA-Score developed by Demerjian et al. (2012). The authors apply Data Envelopment Analysis (DEA) to measure firm efficiency by comparing the sales generated by each firm, based on the following inputs: cost of goods sold (COGS), selling and administrative expenses (SAE), property, plant, and equipment (PPE), operating leases (LEO), research and development expenses (R&D), acquired goodwill (AGI), and other intangible assets (OAIN). According to Demerjian et al. (2012), the following optimization problem is applied:

$$max_v \theta = \frac{Revenue}{v_1 COGS + v_2 SAE + v_3 PPE + v_4 LEO + v_5 R \wedge D + v_6 AGI + v_7 OAIN}$$

The DEA efficiency measure ranges from 0 to 1, and reflects the extent to which a firm operates efficiently. Observations with a value of 1 are considered fully efficient. A firm with a score below 1 would need to reduce costs and/or increase revenue to achieve efficiency.

Demerjian et al. (2013) refined the DEA efficiency measure by separating it from firm-specific characteristics that may facilitate or constrain managerial efforts. Thus, the authors' managerial ability measure is manager-specific. Consequently, managerial ability is measured directly from the firm's actual performance, as reflected in the financial statements, rather than relying on third-party perceptions (Baik et al., 2020).

Next the Tobit regression model presented in Equation 1 is then estimated, controlling for industry effects:

Equation 1

$$EC_{it} = \alpha_0 + \alpha_1 NL(TA)_{it} + \alpha_2 CM_{it} + \alpha_3 FCF_{it} + \alpha_4 NL(AGE)_{it} + \alpha_5 BSC_{it} + \alpha_6 ERV_{it} + \sum efixed\_sector\_effect_t + \varepsilon_{it}$$

in what

EC_{it} = efficiency of company i in period t;

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

CM_{it} = company i's market share during period t;

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

$NL(AGE)_{it}$ = natural logarithm of the company's age;

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

ERV_{it} = indicator of exchange rate variation adjustment for company i in period t;

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

Regarding the control variables, free cash flow (FCF) was used, defined as a dummy variable, assigned a value of 1 for firms reporting positive amounts and 0 otherwise. Business segment concentration (BSCit) represents the proportion between the main segment's sales and those of other operating segments, with a value of 1 assigned to firms operating in a single segment and 0 for those operating in more than one. Finally, the foreign exchange adjustment indicator (ERVit) is a dummy variable, taking the value 1 for firms that made foreign exchange adjustments during the period and 0 otherwise.

3.2.2 Life Cycle Stages

For the present study, we adopted the classification method proposed by Dickinson (2011), based on an integrated assessment of firms' cash flow behavior across operating, investing, and financing activities. This approach is appropriate because the combination of these cash flow components reflects multiple organizational conditions and strategic characteristics.

Based on the composition of the cash flow signs in these three activities, operating, investing, and financing, each firm was classified into a specific stage of the life cycle, as shown in Table 3 below:

Table 3. Life Cycle Classification

Composition of Signals for Classification of Life Cycle Stages			
Life cycle	Operational (OCF)	Investment (ICF)	Financing (FCF)
Introduction (IN)	(-)	(-)	(+)
Growth (GR)	(+)	(-)	(+)
Maturity (MA)	(+)	(-)	(-)
Turbulence (TU)	(+/-)	(+/-)	(+/-)
Decline (DE)	(-)	(+)	(+/-)

Source: Adapted from Dickinson (2011).

In the introduction stage, operating cash flow is negative because firms have little or no knowledge of the dynamics of revenues and costs. At the same time, these companies tend to make significant investments (negative sign of ICF – Investing Cash Flow) to support their market entry, which requires external financing (positive sign of FCF – Financing Cash Flow). In the growth stage, firms continue to make substantial investments, thereby requiring even greater volumes of external financing.

In the maturity stage, firms possess greater knowledge of the market and their operations, thereby maximizing profits and generating positive operating cash flow (OCF). However, growth opportunities tend to stabilize, while asset-maintenance costs increase, negatively affecting cash inflows from investing activities (ICF). At this stage, mature firms allocate profits to shareholders through dividend payments, using internally generated resources, resulting in negative financing cash flow (FCF).

In the maturity stage, firms have greater knowledge of their markets and operations, maximizing profits and generating positive operating cash flow (OCF). However, growth opportunities tend to stabilize, while asset-maintenance costs increase, thereby negatively affecting investment cash flow (ICF). At this stage, mature firms allocate profits to shareholders through dividend payments, using internally generated resources, resulting in negative financing cash flow (FCF).

Firms in the decline stage will experience declines in revenue and prices, resulting in negative operating cash flow. To meet financial obligations, they may prioritize debt renegotiation and repayment, as well as asset liquidation. Consequently, investing cash flow may become positive due to the sale of assets.

Regarding the Turbulence period, Dickinson (2011) did not identify a consolidated theory in the economic literature about its characteristics. For this reason, this life-cycle stage was not included in the present study.

3.2.3 Accruals Earnings Management

Total accruals (ACC) were calculated as the difference between the company's net income or loss and its operating cash flow for the period, using the balance sheet approach, as defined by Dechow and Dichev (2002).

To estimate discretionary accruals, this study applied the model developed by Kothari et al. (2005) , an extension of the Jones (1991) and Modified Jones (Dechow et al., 1995) models, incorporating return on assets (ROA) as an explanatory variable for total accruals. Since this study treats ROA as an incentive variable for earnings management, lagged ROA was used in the Kothari et al. (2005) model. The econometric model proposed by the authors is presented in Equation 2.

Equation 2

$$ACC_{i,t} = \alpha + \beta_1\left(\frac{1}{A_{it-1}}\right) + \beta_2(\Delta Rev_{it} - \Delta AR_{it}) + \beta_3(PPE_{it}) + \beta_4(ROA_{it}) + \varepsilon_{i,t}$$

Where:

ACC_{it} = total accruals, calculated from a balance sheet perspective, scaled by A_{t-1};

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

ΔRev_{it} = variation in net revenues, scaled by A_{t-1};

ΔAR_{it}= variation in accounts receivable, scaled by A_{t-1};

PPE_{it}= gross property, plant, and equipment, scaled by A_{t-1};

ROA_{it}= return on assets for year t, scaled by A_{t-1};

ε_{it} = regression error (proxy for GR by discretionary accruals);

α, β_1, β_2, β_3, β_4= Estimated regression coefficients.

The residual value generated by the Kothari et al. (2005) model represents the measure of earnings management. The model was estimated by industry and year.

3.3 Empirical Model

The research hypotheses were tested using Ordinary

Least Squares (OLS) regressions with robust standard errors and controls for year and industry fixed effects, implemented in Stata. To justify the use of robust standard errors, the White test was performed, with the null hypothesis of homoscedasticity. The test results indicated rejection of the null hypothesis, thereby providing evidence that the model is heteroskedastic. In this scenario, one alternative recommended by Brooks (2014) is to adopt a model with robust standard errors.

All variables were winsorized at the 1% level prior to model estimation. The Shapiro–Wilk normality test indicated that the data are not normally distributed. However, the Central Limit Theorem, given the sample size, mitigated this OLS linear regression assumption. In addition, multicollinearity among the variables was assessed using the Variance Inflation Factor (VIF), and residual autocorrelation was examined using the Durbin–Watson test; the results are reported in Tables 6 and 7.

Equation 3

$$EM_{it}=\alpha_0+\beta_1 LCS_{it}+\beta_2 \sum CV_{it}+\sum fixed\_effect\_year_t+\sum fixed\_effect\_sector_t+\varepsilon_{it}$$

in what

EM_{it} = variable of earnings management by accruals of company i in period t;

LCS_{it} = Life cycle stages (introduction and decline) of firm i in period t;

CV_{it} = Control variables (Size – natural logarithm of total assets, and Growth – sales growth) of firm i in period t;

ε_{it} = Regression error.

Equation 4

$$EM_{it}=\alpha_0+\beta_1 LCS_{it}+\beta_2 MAB_{it}+\beta_3 LCS_{it}*MA+\beta_4 \sum CV_{it}+\sum fixed\_effect\_year_t+\sum fixed\_effect\_sector_t+\varepsilon_{it}$$

MAB_{it} = Managerial ability of firm i in period t.

4 Analysis and Discussion of Results

4.1 Descriptive analysis and correlation of variables

Table 4 presents descriptive statistics for the dependent variable (GR), the independent variable of interest (HG), the life-cycle-related variable (CV), and the control variables included in the study.

Table 4. Descriptive statistics of the research variables

Panel A: Descriptive analysis of continuous variables					
Variables	**Average**	**σ**	**Median**	**25%**	**75%**
EM	0.064	0.721	0.044	0.021	0.083
MANAGERIAL ABILITY	-0.033	0.021	0.028	0.018	0.043
SIZE	21.86	1.853	21.93	20.61	23.11
COMPANY GROWTH	-0.121	4.110	0.066	-0.390	0.147
Panel B: Descriptive analysis of dichotomous variables					
Variables			**Number**		**Frequency (%)**
INTRODUCTION			515		23.94
GROWTH			252		11.72
MATURITY			692		32.22
TURBULENCE			023		5.72
DECLINE			568		26.41

Legend: σ = standard deviation. EM: earnings management through discretionary accruals.
Source: Research data.

As shown in Table 4, managerial ability has a mean of approximately zero (−0.033). This result is consistent with Demerjian et al. (2012), in which the values are close to zero and negative. Earnings management presents a positive mean of 0.064. Regarding accrual-based earnings management, the positive mean indicates that, on average, firms in the sample use this EM practice to increase reported earnings. With respect to the control variables, the average firm growth rate was −0.121, indicating low variation in sales growth.

Regarding the life cycle, the highest concentration of firms is observed in the maturity stage (693), followed by the decline stage (568). These findings are also consistent with the evidence reported by Lima et al. (2015).

Table 5 presents the correlation matrix among the variables analyzed in the study.

Table 5. Correlation matrix

Variable	EM	MAB	IN	DE	SIZE	GRO
EM	1.000					
MAB	0.096**	1.000				
IN	0.026***	-0.022	1.000			
DE	0.112***	-0.013	-0.333***	1.000		
SIZE	-0.198***	-0.019	0.001	0.023	1.000	
GRO	0.050	0.044	0.013	0.185	0.008	1.000

Legend: Significance levels: *p<0.1, **p<0.05, ***p<0.01. EM: discretionary accruals earnings management. MAB: managerial ability. IN: Introduction. DE: Decline. SIZE: size. GRO: company growth.
Source: Research data.

In Table 5, earnings management is negatively correlated with firm size (SIZE) (-0.198), while positive correlations are observed with managerial ability (MA) (0.096), Introduction (INT) (0.026), and Decline (DEC) (0.112). Overall, the data in Table 5 reveal no strong correlations among the variables, suggesting the absence of multicollinearity in the subsequent regression models.

4.2 Hypothesis Testing

As shown in Table 6, we used ordinary least squares (OLS) regression with robust standard errors, controlling for sector and year. The Durbin–Watson statistics are close to 2.0 across all models, indicating no evidence of autocorrelation. Furthermore, multicollinearity did not significantly affect the evaluated regressions.

Table 6. Life-cycle and management of accounting earnings

Variables	Signal	EM (Model 1)	
		Coefficient	Test t
Constant	+/-	-0.027	-1.38
INTRODUCTION	+	0.065***	3.17
GROWTH	-	0.016	0.80
MATURITY	-	-0.002	-0.15
DECLINE	+	0.042**	2.08
SIZE	-	-0.010***	-6.63
COMPANY GROWTH	+	0.012**	1.74
Fixed Effects by Sector and Year		Yes	
Adjusted R^2		8.23	
VIF		1.02 a 1.69	
DW		2.05	
N		2.150	

Legend: Significance levels: * p<0.1, ** p<0.05, *** p<0.01. EM: Discretionary accruals earnings management. VIF: Variance Inflation Factor. DW: Durbin Watson. N: Number of observations.
Source: Research data.

In Table 6, the dependent variable is a proxy for earnings management, and the independent variable of interest comprises the life-cycle stages: INT (Introduction), GR (Growth), MAT (Maturity), and DEC (Decline). The estimates of earnings management in the introduction and decline life cycles are significant and positive, with coefficients of 0.065 (p<0.000) and 0.042 (p<0.05), respectively.

In contrast, the coefficients for the growth and maturity cycles were not statistically significant. Since higher values of the earnings management index indicate a greater intensity of earnings management practices, these results suggest that firms in the introduction and decline stages exhibit higher levels of earnings management, whereas those in the growth and maturity stages do not. This evidence supports research hypothesis H1. These findings align with the studies of Lima et al. (2015), which explain the quality of accounting information through life cycles.

Table 7 presents the moderating effect of managerial skill on the relationship between the life cycle and results management. The Durbin-Watson (DW) test showed values close to 2. These results indicate that the assumption of independent errors in the data is satisfied and that there is no autocorrelation in the residuals (Marôco, 2011). In addition, the variance inflation factor (VIF) values

remain within the acceptable range of 1 to 10, suggesting the absence of multicollinearity (Hair Jr. et al., 2009).

Table 7. Life-cycle moderation and managerial skill in managing accounting earnings

Variables	Signal Expected	EM (Model 2)	
		Coefficient	Test t
Constant	+/-	0.340***	8.33
MAB		-0.016	-2.29
IN*MAB	+	0.157***	2.85
GR*MAB	+	-0.041**	-2.91
MA*MAB	+	-0.016*	-1.74
DE*MAB	+	0.105***	8.88
SIZE	-	-0.010***	-6.63
COMPANY GROWTH	+	0.012**	1.74
Fixed Effects by Sector and Year		Yes	
Adjusted R^2		9.12	
VIF		1.02 a 1.69	
DW		2.05	
N		2.150	

Legend: significance levels: * p<0,1, ** p<0.05, *** p<0.01. EM: Discretionary accruals earnings management: MAB: managerial ability. IN: Introduction. GR: Growth (life cycle phase). MA: Maturity. DE: Decline. VIF: Variance Inflation Factor. DW: Durbin Watson. N: Number of observations. Source: Research data.

Table 7 shows a negative moderating effect of managerial skill on the relationship between the growth (-0.041, p<0.05) and maturity (-0.016, p<0.10) life cycle stages and earnings management. The findings also demonstrate that managerial skill (MS) positively moderates the relationship between the introduction (0.157, p<0.000) and decline (0.105, p<0.000) life cycle stages and earnings management. This body of evidence indicates that, in general, companies in the introduction and decline phases tend to adopt earnings management practices and that managerial skill reinforces this behavior, confirming research hypothesis H2.

4.3 Discussion of Results

Studies indicate that companies in the introductory phase of the life cycle are developing organizational practices, processes, and systems. Furthermore, they exhibit a complex organizational structure focused on innovation and growth (Dickinson, 2011). Consequently, they face difficulties in creating and maintaining robust accounting information systems (Ashbaugh-Skaife et al., 2007; Doyle et al., 2007). which can create conditions conducive to earnings management.

During the decline phase, companies exhibit lower investment, lower liquidity, fewer share issuances, and weaker analyst monitoring (Dickinson, 2011; Hansen et al., 2018; Hasan et al., 2015). During this stage, products tend to lose market share, and sales volume becomes increasingly difficult to sustain, necessitating resource conservation through reduced investment in innovation and lower prices (Miller & Friesen, 1984). These characteristics indicate that, like companies in the introduction phase, declining companies are prone to adopting earnings management practices, as noted by Krishnan et al. (2021).

Consistent with these arguments, Almeida and Kale (2024) find that companies in the growth and maturity stages present higher-quality accounting information, whereas those in the introduction and decline stages generally present lower-quality information. Jaggi et al. (2022) add that managers tend to adjust profits upward during the introduction and decline phases to signal positive performance and prolong the company's survival. During the growth and maturity phases, they use negative provisions to smooth earnings and reserve profits for periods of weaker performance.

According to Demerjian et al. (2012), managers possess superior knowledge of their companies' operational environment, allowing them to align financial reports with business strategies. Furthermore, Lunardi et al. (2022) highlight that highly skilled managers seek to demonstrate their managerial abilities to the market, avoiding losses and pursuing performance benchmarks, thereby increasing the likelihood of earnings management. Therefore, it is reasonable to conclude that companies in the introduction and decline phases, which face a greater need to position themselves positively in the market, are more likely to adopt earnings management practices when led by managers that are more skilled.

According to Dickinson (2011), companies in the growth and maturity phases face less information asymmetry and have easier access to financing. Furthermore, they generally have more developed accounting systems and more robust internal controls, which create additional barriers to the adoption of earnings management practices (Hasan & Cheung, 2018).

Baik et al. (2020) identify that highly skilled managers tend to incorporate more forward-looking information about future cash flows. García-Meca and García-Sánchez (2018) argue that, due to the prospect of increased compensation and reputation, managers that are more skilled may be more concerned with the quality of the accounting information environment, which may lead them to reduce earnings management.

The regression results for Model (2) show that the coefficients of most control variables present the predicted signs and statistical significance. As demonstrated in a previous study (Lunardi et al., 2022), company size is negatively associated with earnings management (-0.010; p<0.000). This demonstrates that larger companies tend to adopt fewer earnings management practices, possibly because they are more subject to regulatory, supervisory, and internal control bodies.

Furthermore, regarding the control variables, it was found that GR has a positive relationship in Model 2 (Table 7) with sales growth (0.012; $p<0.05$). These results indicate that companies with higher sales proportions are more likely to engage in earnings management practices.

5 Final Considerations

This study aimed to test the moderating effect of managerial skill on the relationship between life-cycle stages and earnings management. The evidence indicates that the introduction and decline phases are positively and significantly associated with accruals management, and this effect becomes stronger when the company has managers that are more skilled.

In the growth and maturity stages, however, managerial skill has a negative moderating effect, revealing a behavior contrary to that observed in the initial and final stages of the life cycle. These findings indicate that the life cycle affects the quality of accounting information and that the influence of managerial skill varies by the phase in which the company operates. In the introduction and decline phases, managers that are more skilled tend to maximize the use of earnings management practices, whereas in the growth and maturity phases, this same managerial skill tends to minimize such practices.

Furthermore, the study contributes to the literature by highlighting that environmental factors, both internal and external to companies, such as life-cycle stages, affect the quality of accounting information (Lima et al., 2015), and by demonstrating that managerial skills influence the adoption of accounting practices across organizational phases.

Although the findings provide robust evidence that managerial skill affects earnings management across different stages of the life cycle, this relationship may be partly attributable to the complexity of the firm and the hiring of talented managers capable of operating in complex organizational environments. Thus, earnings management may reflect not only individual managerial behavior, but also strategic decisions made collectively by the management team (Lunardi et al., 2022).

As a contribution, the study provides evidence that managers should recognize the importance of aligning accounting practices with the stages of the company's life cycle. In phases such as introduction and decline, where the demand for strategic decisions is more pronounced, managerial skill is relevant to accounting practice.

The results contribute by demonstrating to investors that they should analyze companies in the introduction and decline stages more cautiously, as these companies show a greater propensity for earnings management, especially when led by highly skilled managers. For auditors, these stages require more rigorous procedures due to the higher level of accounting discretion involved. Regulators, in turn, should pay closer attention to companies in more critical stages given the stronger incentives for earnings management.

This study has some limitations. Classifying companies into life cycle stages based on accounting indicators may not capture the operational characteristics of each phase. Measuring managerial skills using quantitative models does not account for the qualitative aspects of managerial profiles. Earnings management reflects discretionary accrual practices and may not cover other forms of management. Finally, the institutional context and the period analyzed may limit the generalizability of the findings.

To deepen understanding of this phenomenon, future research could adopt qualitative approaches to examine in greater detail the relationship between managerial ability and earnings management practices across different life cycle stages. This approach can also help resolve potential doubts regarding the HG metric proposed by Demerjian et al. (2013) and the Dickinson life cycle model (2011), both used in this study.

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