

“Effect of board characteristics on real and accrual-based earnings management: Evidence from Vietnamese listed non-financial firms”

AUTHORS	Cao Thi Nhan Anh 
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Cao Thi Nhan Anh, MA, Ho Chi Minh
City University of Technology and
Engineering, Vietnam.

Cao Thi Nhan Anh (Vietnam)

EFFECT OF BOARD CHARACTERISTICS ON REAL AND ACCRUAL-BASED EARNINGS MANAGEMENT: EVIDENCE FROM VIETNAMESE LISTED NON-FINANCIAL FIRMS

Abstract

Financial reporting quality is important for maintaining investor confidence, but earnings management remains a persistent concern in developing markets where corporate governance mechanisms are still being strengthened. Vietnam offers a suitable context for this issue because listed firms operate in an environment marked by evolving governance practices, uneven disclosure quality, and concentrated ownership structures. This study examines whether board quality helps limit real earnings management (REM) and accrual-based earnings management (AEM) among Vietnamese non-financial listed firms. The dataset includes 3,697 firm-year observations for companies listed on the Ho Chi Minh Stock Exchange and the Hanoi Stock Exchange from 2017 to 2023. Board quality is captured by an unweighted Board Characteristics Index based on ten board-related attributes. AEM is proxied by performance-matched discretionary accruals, while REM is derived from abnormal cash flows from operations, abnormal production costs, and abnormal discretionary expenses. Panel regression models are estimated, and Feasible Generalized Least Squares (FGLS) is applied to address heteroskedasticity. The main results show that board quality is negatively and significantly related to REM, with a coefficient of -0.0701 and a z -value of -3.19 at the 1% level. In contrast, the relationship between board quality and AEM is negative but statistically insignificant, with a coefficient of -0.0194 . These findings indicate that boards are better able to constrain earnings manipulation through operating activities than through accrual choices. For Vietnamese listed firms, stronger board monitoring over real business decisions may help improve the transparency of financial reporting.

Keywords

governance, board, accruals, monitoring, earnings management, Vietnam

JEL Classification

M41, G34, G32

INTRODUCTION

Accurate financial reporting is critical to the functioning of capital markets. Investors, creditors, regulators, and other users rely on accounting information to evaluate a firm's performance, financial condition, and risk. However, when managers have discretion in reporting earnings, the reported figures may not portray the firm's true economic circumstances. Consequently, financial reporting may become less useful for decision-making purposes, firm value may be distorted, and investor confidence may erode.

This issue is particularly important in emerging and frontier markets, where CG systems, investor protection, disclosure practices, and enforcement mechanisms are still developing. In such settings, information asymmetry between managers and outside stakeholders may be more severe, while external monitoring mechanisms may not be



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strong enough to fully constrain opportunistic reporting behavior. As a result, internal governance mechanisms, especially the board of directors, become important in supporting reporting transparency and limiting managerial discretion.

Vietnam provides a relevant context for examining this issue. The Vietnamese listed market has expanded substantially, and listed firms have faced increasing pressure to improve transparency, accountability, and CG practices. However, the market still reflects several characteristics commonly observed in emerging economies, including concentrated ownership, state-related ownership, uneven disclosure quality, and differences in board practices across firms. These features may create conditions in which managerial discretion can influence both accounting estimates and real operating decisions.

The scientific problem is that the effectiveness of board governance in limiting EM remains unclear in a developing market such as Vietnam. Previous studies have often examined separate board attributes or broader governance mechanisms, while less attention has been given to board quality as a multidimensional index. In particular, the phenomenon of director busyness has rarely been integrated into a composite, although multiple directorships may affect directors' monitoring time and capacity. Therefore, clearer evidence is needed on whether a composite Board Characteristics Index, including director busyness, is associated with REM and AEM among Vietnamese listed nonfinancial firms.

1. LITERATURE REVIEW AND RESEARCH HYPOTHESES

EM has been widely studied in accounting and CG research, as it signals firm value, affects managerial evaluation, and can influence investment decisions. Researchers distinguish between two main types of EM: AEM and REM. AEM involves discretionary adjustments to accounting estimates and judgments, while REM occurs when managers adjust routine business operations, including sales figures, production levels, or discretionary spending, to achieve targeted financial outcomes (Healy & Wahlen, 1999).

The relationship between board structures and EM is often interpreted through the lens of agency theory. When owners are not directly involved in daily management, managers may have room to use reporting discretion in ways that support their own interests or short-term performance goals, rather than fully reflecting shareholders' long-term value (Berle & Means, 1932; Jensen & Meckling, 1976). This problem becomes more relevant when information asymmetry is high, since outside shareholders cannot easily observe all accounting judgments and business decisions made by managers. Boards of directors play a key role in overseeing managerial actions and mitigat-

ing conflicts that arise from agency problems, although their effectiveness may differ across firms and institutional settings (Fama, 1980; Fama & Jensen, 1983). Positive accounting theory also suggests that managers' reporting choices may be influenced by compensation contracts, debt pressure, political costs, and capital-market expectations (Watts & Zimmerman, 1986). In the EM literature, AEM is usually linked to accounting estimates, provisions, and discretionary accruals, which are commonly measured using the Jones model and its later modifications (Dechow et al., 1995; Jones, 1991; Kothari et al., 2005). REM is different because it relates to changes in normal operating activities, such as accelerating sales, producing more than normal demand, or reducing discretionary expenses to influence reported earnings (Roychowdhury, 2006; Cohen & Zarowin, 2010; Zang, 2012).

Board attributes play a critical role because they determine how well directors can oversee managers and support the quality of financial reporting. Yet their effect is not the same in every market. Legal rules, ownership structures, disclosure practices, and the level of institutional development can all shape how board composition, independence, expertise, diversity, leadership structure, and directors' available monitoring time work in practice. This helps explain why previous findings are not fully consistent. Some studies show that board

characteristics are linked to EM, but the direction and strength of this link often depend on the institutional context and on whether the study focuses on AEM or REM (González & García-Meca, 2014; Alareeni, 2018; Abdou et al., 2021; El Diri et al., 2020). A similar pattern appears in studies of CG and different forms of EM. Stronger governance is sometimes connected with lower discretionary accruals or less earnings manipulation, while other studies find weak, insignificant, or mixed effects (Abed et al., 2012; Lo et al., 2010; Feng & Huang, 2021). In the MENA context, board size, board independence, and gender diversity are not significantly related to either AEM or REM, whereas CEO duality is negatively associated with REM (Almarayeh et al., 2024). These findings imply that board monitoring should be interpreted within the institutional setting in which firms operate.

Board size has been widely examined, but its association with EM remains inconclusive. Larger boards may provide broader expertise and external connections, although they may also face coordination problems and weaker individual accountability (González & García-Meca, 2014; Kiel & Nicholson, 2006). In Vietnam, prior evidence is also mixed: some studies report a negative association between board size and EM, while others suggest that this relationship may vary depending on the type of EM or firm size (Cho & Chung, 2022; Pham et al., 2022; Le & Nguyen, 2023; Githaiga et al., 2022).

Board independence is another commonly examined monitoring attribute, but formal independence does not necessarily imply effective oversight. Vietnamese evidence suggests that independent directors may be associated with lower EM in some settings, while the proportion of outside directors may be insignificant when not supported by ownership incentives or sufficient authority (Cho & Chung, 2022). This may help explain the weak, insignificant, or mixed associations reported in other studies (Almarayeh et al., 2024; El Diri et al., 2020; Le & Nguyen, 2023).

Board diversity and expertise may also be related to the board's ability to monitor financial reporting. Gender diversity can bring wider perspectives and reduce groupthink, although its association with EM appears to differ across firms and institutional settings (Adams & Ferreira, 2009; Ouni

et al., 2022; Sarhan et al., 2019). Financial and accounting expertise is also relevant, as directors with such knowledge may be better able to assess accrual estimates, accounting policies, audit matters, and reporting judgments (Abbadi et al., 2016; Musa et al., 2023). However, these attributes are unlikely to strengthen monitoring unless directors are actively involved and have sufficient authority on the board.

The board's monitoring role may also depend on leadership structure, foreign representation, and ownership involvement. A non-executive chairperson may help reduce managerial dominance and support board oversight. Foreign directors can bring international experience and exposure to different governance practices, while ownership involvement may shape directors' incentives and capacity to monitor management (Masulis et al., 2012; Du et al., 2017). Directors representing substantial shareholders may have stronger monitoring incentives, although concentrated ownership can also create conflicts between controlling and minority shareholders. In Vietnam, ownership structure appears to be linked to EM incentives through state ownership, foreign ownership, managerial ownership, and ownership concentration (Cho & Chung, 2022; Le & Nguyen, 2023; Nguyen et al., 2024; Pham et al., 2022).

Director busyness provides another view of board monitoring. Directors with multiple board seats may bring stronger reputations, broader experience, and wider professional networks, but excessive commitments may reduce the time and attention given to each firm. The literature therefore distinguishes between the reputation view and the busyness view (Cashman et al., 2012; Ferris et al., 2003; Ferris & Liao, 2019; Tham et al., 2019). Evidence remains mixed: multiple directorships have been found to be positively related to REM, while their association with AEM is not always significant; other findings suggest that busy independent directors may be linked to lower REM in some settings (Baatour et al., 2017; Asad et al., 2024). Together with recent Vietnamese evidence on busy boards and EM in listed real estate firms (Cao & Nguyen, 2025), these findings suggest that director busyness should be examined alongside other board characteristics rather than as a stand-alone governance factor.

The difference between REM and AEM adds another layer to board monitoring. These two methods rely on different managerial choices and carry different detection risks. Managers may shift between them depending on audit scrutiny, regulatory pressure, litigation risk, and expected manipulation costs (El Diri et al., 2020; Zang, 2012). Thus, examining only one form of EM may provide an incomplete view of board monitoring (Almarayeh et al., 2024).

Because findings on individual board characteristics are often mixed, a composite measure may offer a broader view of board quality. Governance index approaches combine several governance provisions and assess their overall effects (Gompers et al., 2003). Hassan et al. (2023) suggest that different board roles may influence EM in different ways. In the Vietnamese context, Nguyen et al. (2024) find that a broad CG index is linked to lower accrual-based and REM among listed firms.

Vietnam provides a useful setting for this study because corporate governance rules have been strengthened, but disclosure quality, investor protection, and board practices remain uneven across listed firms. The market also has distinctive ownership features, including state ownership, concentrated ownership, and rising foreign investment. Prior Vietnamese studies suggest that board characteristics and ownership structure relate to EM in different ways (Cho & Chung, 2022; Le & Nguyen, 2023; Pham et al., 2022). Dang and Nguyen (2024) further show that the COVID-19 pandemic affected EM among Vietnamese listed nonfinancial firms.

Previous studies suggest that board governance can influence earnings management, but the evidence is mixed and context-dependent. The impact may differ between real earnings management (REM) and accrual-based earnings management (AEM), as these two types involve different managerial decisions and face different risks.

This study aims to examine whether board quality, measured by a composite Board Characteristics Index, is associated with REM and AEM among Vietnamese non-financial listed firms during 2017–2023. Based on this purpose, the following hypotheses are proposed:

H1: The Board Characteristics Index has a negative effect on REM.

H2: The Board Characteristics Index has a negative effect on AEM.

2. METHODS

The empirical analysis is based on panel data and focuses on how the Board Characteristics Index relates to two EM practices: manipulation through real operating activities and accrual-based accounting choices. The sample consists of non-financial firms listed on the Ho Chi Minh Stock Exchange and the Hanoi Stock Exchange between 2017 and 2023. Financial firms are excluded because they operate under different reporting rules, regulatory requirements, and accrual structures compared with other listed companies. Firm-year observations are removed when the required data are missing or when the available information is not sufficient to estimate the EM proxies. To reduce the influence of outliers, all continuous variables are winsorized at the 1st and 99th percentiles. After this screening process, the final sample includes 3,697 firm-year observations.

The empirical analysis is conducted in five steps. First, financial, governance, and macroeconomic data are collected and organized at the firm-year level. Second, AEM is estimated using performance-matched discretionary accruals following Kothari et al. (2005). Third, REM is measured through abnormal operating cash flows, abnormal production costs, and abnormal discretionary expenses following Roychowdhury (2006). Fourth, the Board Characteristics Index and control variables are constructed. Finally, panel regression models are estimated to test the proposed hypotheses.

AEM is estimated using performance-matched discretionary accruals following Kothari et al. (2005). This model builds on the modified Jones approach by adjusting for firm performance. Total accruals are estimated as follows:

$$\begin{aligned} \frac{TA_{i,t}}{A_{i,t-1}} = & \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} \\ & + \beta_2 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{A_{i,t-1}} \\ & + \beta_4 ROA_{i,t-1} + \varepsilon_{i,t}. \end{aligned} \quad (1)$$

In this model, $TA_{i,t}$ denotes total accruals of firm i in year t , and $A_{i,t-1}$ denotes total assets at the end of the previous year. $\Delta REV_{i,t}$ and $\Delta REC_{i,t}$ represent changes in revenue and receivables, respectively. $PPE_{i,t}$ refers to property, plant, and equipment, while $ROA_{i,t}$ denotes return on assets. The residual term from the model is used as the proxy for discretionary accruals.

REM is estimated following Roychowdhury (2006). The study measures three components of real activity manipulation: abnormal cash flows from operations, deviations in production costs, and discretionary expense anomalies. These components reflect deviations from normal operating activities related to sales, production, and discretionary expenditure decisions. These abnormal components are aggregated to form the overall REM measure. This method follows the approach used in prior research on board governance and examines both REM and AEM (Almarayeh et al., 2024; Baatour et al., 2017).

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{Sales_{i,t}}{A_{i,t-1}} + \beta_3 \frac{\Delta Sales_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t}, \quad (2)$$

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{Sales_{i,t}}{A_{i,t-1}} + \beta_3 \frac{\Delta Sales_{i,t}}{A_{i,t-1}} + \beta_4 \frac{\Delta Sales_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t}, \quad (3)$$

$$\frac{DISEXP_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{Sales_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t}. \quad (4)$$

In these models, $CFO_{i,t}$ denotes cash flow from operations, $PROD_{i,t}$ refers to production costs, and $DISEXP_{i,t}$ represents discretionary expenses. $S_{i,t}$ denotes sales, while $\Delta S_{i,t}$ captures the change in sales. The residuals obtained from these models are interpreted as abnormal operating activities and are used to construct the REM measure. In this study, AEM is proxied by performance-matched discre-

tionary accruals and denoted as KA, while REM is proxied by the aggregate real earnings management measure and denoted as R_EM.

The main independent variable is the Board Characteristics Index. Using an unweighted index helps avoid subjective weighting and allows the ten board attributes to jointly capture board monitoring capacity. The use of a composite index is consistent with prior governance studies that summarize CG or board quality through combined measures (Gompers et al., 2003; Nguyen et al., 2024). The index consists of ten board characteristics identified from the literature review, including board size, board independence, gender diversity, independent leadership, foreign directorships, major shareholder representation, academic background, financial expertise, chairperson tenure, and busy boards. Each component takes the value of 1 if the firm satisfies the defined criterion and 0 otherwise. The Board Characteristics Index is calculated as the unweighted average of the ten components:

$$BDI_{i,t} = \frac{\sum_{k=1}^{10} Component_{k,i,t}}{10} \quad (5)$$

where $BDI_{i,t}$ denotes the Board Characteristics Index for firm (i) in year (t). The index takes values between 0 and 1, where larger values reflect stronger overall board quality.

To control potential estimation biases, several variables are included. Firm size is captured using the natural logarithm of total assets, while firm age reflects the number of years since incorporation. Leverage is calculated as the ratio of total liabilities to total assets. Audit quality is coded as a binary variable, taking a value of 1 if audited by a Big Four auditor and 0 otherwise. Tangibility is measured as the proportion of tangible fixed assets relative to total assets. The COVID-19 period is accounted for by assigning 1 to observations from 2020 to 2022 and 0 otherwise. Macroeconomic conditions are controlled for using annual GDP growth and inflation rate data.

To examine the proposed hypotheses, the study estimates two baseline regression models. The first model examines the association between the

Table 1. Construction of the Board Characteristics Index

Board attribute	Definition	Scoring Criterion
Board size	Number of directors on the board	Assigned 1 if the total membership exceeds the statutory minimum of five and falls within two standard deviations of the sample mean; 0 otherwise
Board Independence	Share of non-executive directors.	Assigned 1 if non-executive members represent more than 50 percent of the board assembly; 0 otherwise
Board Diversity	Presence of female directors	Assigned 1 if the board contains at least one woman director; 0 otherwise.
Independent Leadership	Chairperson is not part of executive management	Assigned 1 if the presiding chair does not belong to the senior management team; 0 otherwise
Foreign directors	Presence of foreign directors	Assigned 1 when at least one board member is a foreign national; 0 otherwise.
Ownership concentration	Presence of major shareholders on the board	Assigned 1 if at least one major shareholder serves as a board member; 0 otherwise.
Academic background	Board members with postgraduate degrees	Assigned 1 if a majority of board members possess postgraduate credentials; 0 otherwise
Professional expertise	Directors with accounting or finance expertise	Assigned 1 if at least one director has documented financial or accounting proficiency; 0 otherwise
Chairperson tenure	Length of chairperson service	Assigned 1 if the chair's tenure surpasses the overall mean duration of the study sample; 0 otherwise
Busy boards	Directors holding three or more board appointments	Assigned 1 if at least one director manages three or more simultaneous board appointments; 0 otherwise

Table 2. Operational definition and measurement of research variables

Variable	Notation	Measurement	References
Dependent variable			
Accrual-based earnings management	KA	Performance-matched discretionary accruals estimated with the Kothari model to reduce estimation bias.	Dang and Nguyen (2024); Nguyen et al. (2024)
Real earnings management	R_EM	Composite proxy derived from abnormal cash flows from operations, abnormal production costs, and abnormal discretionary expenses.	Baatour et al. (2017); El Diri et al. (2020); Hong et al. (2023); Nguyen et al. (2024)
Independent variables			
Board characteristics index	BDI	A composite governance index developed from ten board-related attributes and scaled to reflect overall board quality.	Baatour et al. (2017); Cashman et al. (2012); Ferris and Liao (2019); Gompers et al. (2003); Le and Nguyen (2023); Nguyen et al. (2024)
Control variables			
Firm size	SIZE	Total assets expressed in natural logarithmic form	Le and Nguyen (2023); Abdou et al. (2021); Nguyen et al. (2024)
Firm age	AGE	Length of time the firm has operated since its establishment	Githaiga et al. (2022); Musa et al. (2023); Nguyen et al. (2024)
Financial leverage	LEV	Total liabilities divided by total assets, expressed as a percentage.	Nguyen et al. (2024)
Big4	BIG4	Indicator variable taking the value of 1 for Big Four-audited firms and 0 otherwise	Abdou et al. (2021); Pham et al. (2022)
Tangibility	TANG	Tangible fixed assets divided by total assets	Nguyen and Huynh (2023)
Pandemic impact	COVID_19	1 for 2020–2022, 0 otherwise	Dang and Nguyen (2024)
Economic growth	GDP	Yearly growth rate of real GDP	Ouni et al. (2022); Trung (2022)
Inflation rate	CPI	Annual inflation rate	Sarhan et al. (2019); Scholtens and Kang (2013)

Board Characteristics Index and real earnings management:

$$\begin{aligned} R_EM_{i,t} = & \beta_0 + \beta_1 BDI_{i,t} + \beta_2 SIZE_{i,t} \\ & + \beta_3 AGE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 BIG4_{i,t} \\ & + \beta_6 TANG_{i,t} + \beta_7 COVID19_{i,t} \\ & + \beta_8 GDP_{i,t} + \beta_9 CPI_{i,t} + \varepsilon_{i,t}. \end{aligned} \quad (6)$$

The second model examines the association between the Board Characteristics Index and accrual-based EM:

$$\begin{aligned} KA_{i,t} = & \beta_0 + \beta_1 BDI_{i,t} + \beta_2 SIZE_{i,t} \\ & + \beta_3 AGE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 BIG4_{i,t} \\ & + \beta_6 TANG_{i,t} + \beta_7 COVID19_{i,t} \\ & + \beta_8 GDP_{i,t} + \beta_9 CPI_{i,t} + \varepsilon_{i,t}, \end{aligned} \quad (7)$$

where $R_EM_{i,t}$ denotes real earnings management, $KA_{i,t}$ denotes accrual-based earnings management, $BDI_{i,t}$ denotes the Board Characteristics Index, and $\varepsilon_{i,t}$ is the error term. The coefficient β captures the relationship between board quality and EM. A negative and statistically significant coefficient would indicate a negative association between board quality and EM.

The empirical analysis starts with pooled OLS, fixed-effects, and random-effects estimations. Model selection follows standard panel-data tests, including the Hausman test. Diagnostic tests are then used to check for heteroskedasticity, autocorrelation, and endogeneity. Because heteroskedasticity is detected, FGLS is applied as the main estimation method to improve efficiency under heteroskedastic errors. Additional analyses divide the sample by stock exchange and industry group

to assess whether the baseline results remain consistent across alternative sample partitions.

The dataset was constructed specifically for this study using audited annual reports, CG reports, firms' official disclosures, stock exchange disclosures, Vietstock Finance, and official macroeconomic sources. It has not been used in previous studies by the author or other researchers. Because part of the dataset was obtained from Vietstock Finance, a proprietary database, the raw data cannot be publicly deposited. However, the sample selection procedure, data sources, variable definitions, coding rules, and model specifications are fully reported to support replication.

3. RESULTS

Table 3 presents the descriptive statistics for the 3,697 firm-year observations used in the study. The Board Characteristics Index (BDI) has a mean value of 0.533 and a standard deviation of 0.134, indicating that board quality differs across Vietnamese listed firms in the sample. The two EM measures are close to zero on average. R_EM records a mean of -0.025 , while KA has a mean of -0.016 . This is reasonable because both variables are estimated from abnormal components of operating activities and accounting accruals.

The control variables also show meaningful variation across firms. Firm size (SIZE) is relatively concentrated around its mean of 27.603, whereas firm age (AGE) and financial leverage (LEV) vary more clearly, suggesting that the sample includes firms at different development stages and with different capital structures. In addition, 26.3% of the firm-year observations are audited by Big Four au-

Table 3. Descriptive statistics

Variable	Observations	Mean	SD	p25	Median	p75
BDI	3,697	0.533	0.134	0.400	0.500	0.600
R_EM	3,697	-0.025	0.328	-0.196	-0.001	0.160
KA	3,697	-0.016	0.268	-0.152	-0.035	0.082
SIZE	3,697	27.603	1.609	26.47	27.54	28.54
AGE	3,697	28.168	14.918	16.00	25.00	40.00
LEV	3,697	40.616	26.094	18.90	42.62	62.25
BIG4	3,697	0.263	0.440	0.000	0.000	1.000
TANG	3,697	0.171	0.178	0.033	0.112	0.252
COVID_19	3,697	0.426	0.495	0.000	0.000	1.000
GDP	3,697	5.767	2.130	2.865	6.940	7.465

dit firms, and 42.6% belong to the COVID-19 period. Overall, the descriptive statistics indicate that the dataset contains sufficient variation in board quality, EM measures, and firm characteristics to support the subsequent correlation and regression analyses.

Table 4 reports the correlation matrix and VIF results, which are used to examine the relationships among the explanatory variables and to assess potential multicollinearity. BDI is positively correlated with firm size and leverage, while its correlations with firm age and inflation are negative. The two EM measures are also positively and significantly correlated. Specifically, the correlation between R_EM and KA is 0.270 and significant at the 1% level, suggesting that firms engaging in R_EM may also engage in KA.

The VIF results further support the suitability of the variables for regression analysis. The highest VIF value is 2.17, which is well below the commonly accepted threshold for multicollinearity concerns. In addition, all pairwise correlation coefficients are below 0.60. Therefore, the results do not indicate serious multicollinearity, and the variables can be included together in the multivariate regression models.

Table 5 presents the preliminary regression estimates from the pooled OLS, fixed-effects, and random-effects models. These models are reported to show the initial pattern of the relationship between board characteristics and the two EM measures before the final estimation is selected.

Across all three specifications, BDI has a negative coefficient in both models. For R_EM, the coeffi-

cients are -0.0987 in pooled OLS, -0.102 in the fixed-effects model, and -0.107 in the random-effects model. For KA, the corresponding coefficients are -0.0656 , -0.147 , and -0.0681 . This consistent negative sign suggests that stronger board characteristics are generally associated with lower EM at the preliminary stage.

Several control variables also show stable patterns. SIZE and LEV are positively related to both R_EM and KA, while AGE, BIG4, TANG, and COVID_19 mostly have negative coefficients. GDP and CPI show less consistent effects across model specifications. Since Table 5 is based on preliminary estimations, these results are used only to describe the initial direction of the relationships. The final hypothesis testing is conducted later using the FGLS estimates reported in Table 7.

Table 6 presents the diagnostic results used to determine the final estimation strategy. For both the R_EM and KA models, the Modified Wald test indicates that heteroskedasticity is present. However, the Wooldridge test does not suggest a serious first-order autocorrelation problem, and the Durbin-Wu-Hausman test shows no clear evidence of endogeneity. The Hausman test further supports the use of fixed effects rather than random effects. On this basis, the fixed-effects framework is retained for both models. Since heteroskedasticity is detected, the final estimations are performed using Feasible Generalized Least Squares to improve the efficiency of the estimated coefficients before testing the research hypotheses (Greene, 2003; Hausman, 1978; Wooldridge, 2010).

Table 4. Correlation matrix and VIF values

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	VIF
(1) BDI	1.000											1.11
(2) R_EM	-0.012	1.000										1.22
(3) KA	-0.007	0.270***	1.000									1.48
(4) SIZE	0.149***	0.155***	0.101***	1.000								1.19
(5) AGE	-0.079***	-0.132***	-0.082***	0.018	1.000							1.07
(6) LEV	0.110***	0.173***	0.109***	0.246***	-0.016	1.000						1.82
(7) BIG4	0.064***	-0.031*	0.009	0.424***	-0.004	0.046***	1.000					1.26
(8) TANG	-0.075***	-0.156***	-0.129***	0.032**	0.126***	-0.000	0.043***	1.000				1.07
(9) COVID_19	0.180***	-0.047***	-0.041**	0.037**	0.066***	0.183***	-0.007	-0.027*	1.000			2.17
(10) GDP	-0.038**	0.054***	0.011	-0.025	-0.045***	0.081***	0.009	0.022	-0.529***	1.000		1.47
(11) CPI	-0.044***	-0.021	-0.025	0.084***	0.138***	-0.405***	-0.010	-0.073***	0.427***	-0.313***	1.000	1.98

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Preliminary regression estimates using OLS and panel data specifications

Variables	R_EM			KA		
	OLS	FEM	REM	OLS	FEM	REM
BDI	−0.0987** (0.0414)	−0.102** (0.0486)	−0.107** (0.0433)	−0.0656* (0.0367)	−0.147*** (0.0538)	−0.0681* (0.0360)
SIZE	0.0396*** (0.00418)	0.132*** (0.0138)	0.0465*** (0.00611)	0.0195*** (0.00332)	0.101*** (0.0153)	0.0161*** (0.00363)
AGE	−0.00329*** (0.000357)	−0.0558*** (0.0198)	−0.00281*** (0.000659)	−0.00154*** (0.000294)	−0.0340 (0.0219)	−0.00129*** (0.000340)
LEV	0.00275*** (0.000273)	0.00144*** (0.000366)	0.00211*** (0.000306)	0.00153*** (0.000231)	0.00138*** (0.000405)	0.00143*** (0.000238)
BIG4	−0.0825*** (0.0129)	−0.0386* (0.0202)	−0.0591*** (0.0163)	−0.0199* (0.0116)	−0.0598*** (0.0223)	−0.0199* (0.0120)
TANG	−0.315*** (0.0284)	−0.171*** (0.0635)	−0.219*** (0.0430)	−0.190*** (0.0263)	−0.264*** (0.0703)	−0.186*** (0.0277)
COVID_19	−0.0856*** (0.0156)	−0.0427*** (0.0143)	−0.0660*** (0.0131)	−0.0613*** (0.0128)	−0.0448*** (0.0159)	−0.0570*** (0.0128)
GDP	0.000781 (0.00298)	0.00521** (0.00226)	0.00331 (0.00223)	−0.00504* (0.00268)	−0.00380 (0.00250)	−0.00466* (0.00240)
CPI	0.00390*** (0.000781)	0.0116*** (0.00413)	0.00290*** (0.000710)	0.00175*** (0.000606)	0.00666 (0.00457)	0.00155** (0.000649)
N	3697	3697	3697	3697	3697	3697

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6. Diagnostic tests and model selection

Model	Heteroskedasticity (Modified Wald test)	Autocorrelation (Wooldridge test)	Endogeneity (Durbin-Wu-Hausman)	Preferred specification
R_EM	Yes	No	No	FE, estimated with FGLS
KA	Yes	No	No	FE, estimated with FGLS

Table 7 presents the FGLS estimates, which are used as the main results due to heteroskedasticity in the panel data. For R_EM, BDI has a negative and statistically significant coefficient, indicating that firms with stronger boards engage less in real activities manipulation. This supports Hypothesis 1. In contrast, for KA, the BDI coefficient is negative but not statistically significant, so Hypothesis 2 is not supported. Board quality appears to influence R_EM more strongly than KA.

Control variables show consistent effects: firm size and leverage are positively associated with earnings management, whereas firm age, Big Four audit quality, and asset tangibility are negatively associated. GDP growth shows mixed effects, while CPI is positively and significantly associated with both R_EM and KA; the COVID-19 period is negatively associated with both measures. These results provide a clear empirical foundation for testing the study hypotheses.

Additional robustness checks are reported in Appendix Tables A1 and A2. The sample is di-

vided by stock exchange and industry group to assess whether the baseline findings remain consistent across different listing venues and business activities. Appendix Table A1 presents the exchange-based results. For the R_EM model, the coefficient of BDI is negative but not statistically significant for HOSE-listed firms ($\beta = -0.0117$), whereas it is negative and significant for HNX-listed firms ($\beta = -0.112$, $p < 0.01$). For the KA model, BDI is not statistically significant in either the HOSE or HNX subsample.

Appendix Table A2 presents the industry-based results. For the R_EM model, BDI remains negative and statistically significant for both manufacturing firms ($\beta = -0.0800$, $p < 0.01$) and non-manufacturing firms ($\beta = -0.136$, $p < 0.05$). For the KA model, BDI remains statistically insignificant in both industry subsamples. These additional tests provide further support for *H1*, particularly in the HNX and industry-based subsamples, but do not support *H2*.

Table 7. Baseline FGLS results for the R_EM and KA models

Variables	FGLS	
	R_EM	KA
BDI	−0.0701*** (0.0220)	−0.0194 (0.0170)
SIZE	0.0364*** (0.00204)	0.0170*** (0.00174)
AGE	−0.00340*** (0.000211)	−0.00109*** (0.000148)
LEV	0.00229*** (0.000154)	0.000958*** (0.000116)
BIG4	−0.0616*** (0.00709)	−0.0160*** (0.00523)
TANG	−0.294*** (0.0159)	−0.119*** (0.0123)
COVID_19	−0.0796*** (0.00862)	−0.0749*** (0.00626)
GDP	0.00295* (0.00159)	−0.00932*** (0.00120)
CPI	0.00252*** (0.000430)	0.00131*** (0.000313)
N	3,697	3,697

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

4. DISCUSSION

The central result is the contrast between R_EM and KA. In the baseline FGLS estimates, BDI is negatively and significantly associated with R_EM ($\beta = -0.0701$, $p < 0.01$), whereas its coefficient in the KA model is negative but statistically insignificant ($\beta = -0.0194$). Thus, H1 is supported, while H2 is not. The findings therefore do not suggest that board quality is related to all forms of earnings management in the same way. Rather, within this sample, the association is evident for real-activity manipulation but not for accrual-based manipulation.

The negative association with R_EM broadly aligns with Vietnamese evidence linking stronger board or corporate governance mechanisms to lower earnings management (Cho & Chung, 2022; Pham et al., 2022; Le & Nguyen, 2023; Nguyen et al., 2024). Nguyen et al. (2024) provide a useful comparison because that study reports lower levels of both accrual-based and real earnings management in relation to a broad corporate governance index, whereas the present study finds a statistically significant association only for R_EM. One

possible reason is the difference in measurement: the current BDI is limited to ten board characteristics, while the index used by Nguyen et al. captures governance more broadly. This explanation is tentative, however, because the present analysis does not test which individual governance mechanisms account for the difference.

Evidence from other settings is also mixed. Almarayeh et al. (2024) find no significant relationships between board size, board independence, or gender diversity and either AEM or REM in the MENA context, although CEO duality is negatively associated with REM. The significant BDI–R_EM association found here therefore differs from results based on several individual board attributes. The evidence on director busyness is similarly unsettled: Baatour et al. (2017) report a positive relationship between multiple directorships and REM, whereas Asad et al. (2024) document circumstances in which busy independent directors are associated with lower REM. Because busyness is only one of the ten equally weighted BDI components, the present findings should not be read as evidence about the separate effect of busy boards.

The insignificant KA result also deserves separate interpretation. Accrual-based earnings management depends on accounting judgments involving estimates, provisions, impairment recognition, revenue timing, and other accrual choices. Making such decisions may require more specialized accounting and auditing knowledge than is captured by a general board index. In this sample, BIG4 is negatively and significantly associated with KA, which is consistent with the possibility that specialized external monitoring is relevant to accrual-based manipulation. This evidence does not establish a monitoring mechanism, but it suggests caution in concluding that a broad measure of board quality alone should be expected to explain variation in AEM.

The Vietnamese setting may also be relevant to the difference between the two results. Listed firms operate with concentrated ownership, some state-related ownership, uneven disclosure quality, and variation in governance practices. Under these conditions, formal board characteristics may not translate uniformly into influence over detailed accounting judgments. Real operating decisions concerning sales, production, and discretionary expenditure may be more visible to directors in the course of normal business oversight. This remains a possible interpretation rather than a tested mechanism, since the study does not directly observe how boards monitor particular managerial decisions.

The robustness tests qualify the baseline result rather than showing a uniform pattern across all subsamples. For R_EM, the BDI coefficient is negative but insignificant among HOSE-listed firms ($\beta = -0.0117$), but negative and significant among HNX-listed firms ($\beta = -0.112$, $p < 0.01$). By industry, the negative association remains significant for both manufacturing firms ($\beta = -0.0800$, $p < 0.01$) and non-manufacturing firms ($\beta = -0.136$, $p < 0.05$). BDI remains insignificant for KA in both exchange and industry subsamples. These results suggest that the R_EM association is reasonably robust across industry groups but may vary across listing markets, while the absence of a significant KA association is more consistent across the reported subsamples.

Taken together, the results support a narrower conclusion than the general claim that stronger boards reduce earnings management. In this sample, stronger composite board characteristics are associated with lower R_EM, while no statistically significant association is detected for KA. This distinction adds to prior work by showing why REM and AEM should be considered separately when evaluating board governance. From a practical perspective, the findings suggest that board monitoring and more specialized accounting and audit oversight may play complementary roles; they do not imply that changes in board structure alone will necessarily reduce earnings management.

CONCLUSION

This study investigates the relationship between board quality, measured through an unweighted Board Characteristics Index (BDI) constructed from ten board attributes, and earnings management in Vietnamese non-financial listed firms between 2017 and 2023. The analysis shows that stronger boards tend to engage less in REM, while the impact on AEM is not statistically significant. This suggests that boards are more effective in overseeing operational decisions than in constraining accrual-based reporting choices.

The results imply that improving board monitoring capacity can help limit managerial manipulation in real operating activities. However, additional governance mechanisms, such as effective audit committees, internal control systems, accounting expertise, and high-quality external audits, remain important for overseeing accrual-based decisions.

Future research could develop more robust composite board indices using statistical techniques such as Principal Component Analysis (PCA) or Multiple Correspondence Analysis (MCA) to better capture

the multidimensional nature of board characteristics. Further studies could also explore alternative EM measures, including discretionary accrual ratios, real activity proxies, or composite indices, to provide a more comprehensive understanding of governance effects in different contexts.

AUTHOR CONTRIBUTIONS

Conceptualization: Cao Thi Nhan Anh.

Data curation: Cao Thi Nhan Anh.

Formal analysis: Cao Thi Nhan Anh.

Writing – original draft: Cao Thi Nhan Anh.

Writing – review & editing: Cao Thi Nhan Anh.

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APPENDIX A

Table A1. Robustness check by stock exchange

Variables	R_EM		KA	
	HOSE	HNX	HOSE	HNX
BDI	−0.0117 (0.0304)	−0.112*** (0.0348)	−0.00711 (0.0220)	−0.0128 (0.0271)
SIZE	0.00732** (0.00331)	0.0543*** (0.00378)	0.0131*** (0.00237)	0.0199*** (0.00305)
AGE	−0.00196*** (0.000275)	−0.00310*** (0.000327)	−0.000892*** (0.000199)	−0.00111*** (0.000219)
LEV	0.00275*** (0.000225)	0.00149** (0.000215)	0.000551*** (0.000156)	0.000991*** (0.000180)
BIG4	−0.0615*** (0.00882)	−0.0113 (0.0129)	−0.0222*** (0.00628)	0.00165 (0.0101)
TANG	−0.197*** (0.0199)	−0.288*** (0.0232)	−0.146*** (0.0153)	−0.112*** (0.0181)
COVID_19	−0.0958*** (0.0122)	−0.0462*** (0.0132)	−0.0792*** (0.00844)	−0.0526*** (0.00991)
GDP	0.00151 (0.00222)	0.00671*** (0.00252)	−0.0113*** (0.00160)	−0.00483** (0.00192)
CPI	0.00352*** (0.000611)	0.000720 (0.000668)	0.000271 (0.000418)	0.00168*** (0.000498)
N	1962	1735	1962	1735

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A2. Robustness check by industry

Variables	R_EM		KA	
	Manufacturing	Non-manufacturing	Manufacturing	Non-manufacturing
BDI	−0.0800*** (0.0226)	−0.136** (0.0541)	−0.0331 (0.0203)	−0.0211 (0.0302)
SIZE	0.0341*** (0.00224)	0.0219*** (0.00539)	0.0177*** (0.00200)	0.00889*** (0.00304)
AGE	−0.00341*** (0.000217)	0.00149** (0.000693)	−0.00120*** (0.000166)	0.000468 (0.000344)
LEV	0.00224*** (0.000162)	0.00151*** (0.000405)	0.00117*** (0.000136)	−0.000271 (0.000234)
BIG4	−0.0507*** (0.00789)	−0.0578*** (0.0184)	−0.0291*** (0.00628)	0.00254 (0.00980)
TANG	−0.301*** (0.0151)	−0.112* (0.0616)	−0.146*** (0.0136)	−0.0285 (0.0307)
COVID_19	−0.0778*** (0.00931)	−0.0540** (0.0221)	−0.0649*** (0.00743)	−0.0787*** (0.0123)
GDP	0.00206 (0.00173)	0.00890** (0.00420)	−0.00768*** (0.00144)	−0.0122*** (0.00230)
CPI	0.00216*** (0.000465)	0.00169 (0.00108)	0.00100*** (0.000373)	0.000581 (0.000607)
N	2823	874	2823	874

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.