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Market Power, Financial Distress, Institutional Ownership, and Modified Real Earnings Management: The Moderating Role of Information Asymmetry in Indonesia

Aqamal Haq
Universitas Trisakti, Indonesia

Etty Murwaningsari*
Universitas Trisakti, Indonesia

Sekar Mayangsari
Universitas Trisakti, Indonesia

***Corresponding author:**
Etty Murwaningsari,
Universitas Trisakti, Indonesia.
✉etty.murwaningsari@trisakti.ac.id

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Abstract

Background: Managers can raise reported earnings through real operating decisions, not accruals alone, and outsiders struggle to detect this when the information environment is opaque. In emerging markets such as Indonesia, market power, financial distress, and institutional ownership may each shape this behavior, yet are rarely examined jointly.
Objective: This study examines whether market power, financial distress, and institutional ownership are associated with Modified Real Earnings Management (Modified REM), and whether information asymmetry conditions these relationships.
Methods: The analysis uses a balanced panel of 624 firm-year observations from 312 production-oriented non-financial firms listed on the Indonesia Stock Exchange during 2023-2024. The primary dependent variable is Modified REM, which extends the conventional Roychowdhury (2006) composite with abnormal corporate social responsibility (CSR) expenditure. Firm fixed-effects regressions with White robust standard errors include interactions between information asymmetry and each determinant.
Results: Market power (coefficient = 4.90; $p < 0.001$) and financial distress (coefficient = 0.0786; $p = 0.0059$) are positively associated with Modified REM, whereas institutional ownership is insignificant. Information asymmetry strengthens the market-power association (interaction = 11.19; $p < 0.001$) but not the financial-distress association, while the institutional-ownership interaction is negative and significant (-4.32; $p = 0.0089$). Conclusions are unchanged under conventional Roychowdhury REM.
Conclusion: The study places Modified REM at the center of the determinant model by adding abnormal CSR expenditure as a distinct real-activity channel, while showing that information asymmetry is a mechanism-specific rather than universal moderator of product-market discretion, financial pressure, and institutional ownership.

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INTRODUCTION

Real earnings management (REM) alters reported performance through actual operational decisions, rather than relying solely on accounting estimates. In some cases, managers may accelerate sales, adjust production volumes, or reduce discretionary expenditures. These actual activities affect cash flow or resource allocation, but the accounting figures continue to appear similar to those resulting from normal business activities (Graham et al., 2005; Gunny, 2010; Nguyen et al., 2023; Roychowdhury, 2006; Zang, 2012). Since real activities are integrated into operating activities, it is crucial for investors, board members, auditors, and regulators to

know when this managerial motivation becomes REM.

There are three distinct factors that influence a firm's economic behavior. First, market forces encourage firms to exercise greater flexibility in pricing, managing production processes, and making decisions regarding the resources to be utilized. Second, financial considerations mean that firms must report satisfactory results to maintain access to financing. Third, institutional ownership implies a supervisory function. However, it is known that the effectiveness of this oversight process varies depending on investor characteristics (Bushee, 1998; Chung et al., 2002; Davis & García-Cestona, 2023; Sakaki et al., 2017). Nevertheless, these mechanisms have been studied separately, so there is no certainty as to whether the influence of the information environment is the same across all these relationships.

Information asymmetry is a highly relevant issue because external parties often have difficulty distinguishing between economically rational operational decisions and actions intended to manipulate reported earnings. However, a high level of information asymmetry need not have a uniform effect. It may magnify the discretion associated with market power, add little to the already strong pressure created by financial distress, or change the conditional relationship between institutional ownership and REM. Treating information asymmetry as a mechanism-specific moderator therefore provides a more discriminating test than treating opacity as a universal driver of earnings management.

This study examines these relationships using 624 firm-year observations from 312 production-oriented non-financial firms listed on the Indonesia Stock Exchange during 2023-2024. The primary outcome is Modified Real Earnings Management (Modified REM), constructed by extending the conventional Roychowdhury REM composite with abnormal CSR expenditure. Market power is represented by the accounting-based price-cost-margin variable used in the research dataset, financial distress by the negative of the Altman Z-score (1968) and Kušter (2023), institutional ownership by the proportion of shares held by institutional investors, and information asymmetry by the annual average relative bid-ask spread. Interaction variables are mean-centered before multiplication, and the final panel specification uses firm fixed effects with White cross-section robust standard errors.

The evidence is not consistent with a single moderating role for information asymmetry. Market power and financial distress are positively associated with Modified REM. The interaction between market power and information asymmetry is positive and significant, whereas the interaction between financial distress and information asymmetry is not significant. The institutional-ownership interaction is negative and significant; therefore, the conditional association between institutional ownership and Modified REM becomes more negative as information asymmetry rises. The current interactions are consistent with, but do not exclusively indicate, tighter oversight in response to higher information risks.

This study makes three major contributions. First, it integrates product-market conditions, financial pressures, and ownership into a single model used to analyze the Modified REM. Second, it demonstrates how information asymmetry affects these factors differently, rather than merely increasing incentives for earnings management. Third, this study employs Modified REM, an extended measure that incorporates abnormal CSR expenditure into the analysis while retaining the conventional Roychowdhury approach as a benchmark for sensitivity analysis. This design captures a broader range of real-activity adjustments without basing the study's conclusions solely on the CSR expenditure component.

Although prior studies have separately linked product-market competition and market power (Chang et al., 2019; Hasan et al., 2022; Lemma et al., 2018), financial distress, and institutional ownership AL-Duais et al., (2022) to earnings management, these forces are rarely examined jointly or tested for whether the information environment conditions each channel differently. The novelty of this study is twofold: it integrates these three determinants within a single conditional model of Modified REM, and it extends the Roychowdhury composite with abnormal CSR expenditure as a distinct real-activity channel, treating information asymmetry as a mechanism-specific rather than universal moderator.

Hypothesis Development

Modified Real Earnings Management and the information environment

According to agency theory, managers possess information advantages and differing

incentives, which lead them to make operational decisions that are not fully aligned with shareholders' interests (Al-Faryan, 2024; Jensen & Meckling, 1976). REM is known to be difficult to evaluate because changes in a company's sales, production, or discretionary spending strategies can be economically efficient or used to manipulate current profits. Roychowdhury (2006) and Nguyen et al. (2023) defines REM as increasing earnings through very low cash flow from operations, very high production costs, and very low discretionary expenditures. Subsequent studies have shown a trade-off between real activities and accrual-based measures and have highlighted the economic costs of engaging in real manipulation (Cohen & Zarowin, 2010; Gunny, 2010; Nguyen et al., 2023; Zang, 2012).

The concept of information asymmetry suggests that outsiders will not be able to accurately evaluate all operational decisions. It is generally recognized that a wider bid-ask spread is an indicator of information frictions in the equity market, and previous research has shown an ambiguous relationship between REM and information asymmetry in market trading (Abad et al., 2018; Dang et al., 2023; Healy & Palepu, 2001). Therefore, this study treats information asymmetry as a moderator variable for the three determinants of Modified REM.

Market power and Modified Real Earnings Management

Market power reflects a company's ability to maintain prices above costs and to make decisions regarding production and trading conditions. The ability to operate freely means that implementing tangible changes becomes easier or more feasible. Previous research has linked product market conditions to earnings management, but the results may vary depending on the metrics and proxies used to measure earnings management. Datta et al. (2013) and Sanusi et al. (2023) demonstrated a relationship between product market power and accrual management. Meanwhile, Sanusi et al. (2023) provided specific evidence for the case of Indonesia regarding product market competition, market power, and REM. Therefore, there is an urgent need to determine whether stronger market power is associated with higher Modified REM.

H1. Market power is positively associated with Modified Real Earnings Management.

Financial distress and Modified Real Earnings Management

Financial distress refers to a situation of urgency without operational flexibility. Companies in poor financial condition are concerned about refinancing options, debt contract terms, reputation, and market confidence. Therefore, financial pressure may create incentives for managers to alter operational decisions related to sales, production, and discretionary expenditures in ways that affect reported earnings (Habib et al., 2013; Healy & Wahlen, 1999; Paiva et al., 2026). Research in Indonesia shows how financial distress affects the adoption of cash-based or accrual-based earnings management (Mlawu et al., 2026; Muljono & Kim, 2018). In this study, the financial distress variable is measured as the negative of the Altman Z-score, meaning that the higher the value, the greater the financial distress experienced by the company.

H2. Financial distress is positively associated with Modified Real Earnings Management.

Institutional ownership and Modified Real Earnings Management

The power of institutional investors to curb opportunistic reporting practices stems from their analytical capabilities, voting rights, and motivation to protect their portfolio investments (Bushee, 1998; Chung et al., 2002; Gu et al., 2023). Despite this power, ownership percentage alone does not indicate monitoring quality. Consequently, investors operate with varying time horizons, stability, levels of vigilance, and tendencies in opposing opportunistic managerial practices. Evidence showing that higher institutional ownership stability leads to a lower REM underscores the role of monitoring, but also highlights the inherent heterogeneity within the institutional investor group (Davis & García-Cestona, 2023; Kałdoński et al., 2020; Sakaki et al., 2017). In general, higher institutional ownership tends to lower the REM.

H3. Institutional ownership is negatively associated with Modified Real Earnings Management.

Information asymmetry as a moderator

Operational freedom and information asymmetry have the potential to strengthen a company's market power. This is because companies with such power demonstrate flexibility in pricing and production and can also make changes to their actual operations. Consequently,

investors with limited information will find it increasingly difficult to assess these changes. Therefore, the positive market power–Modified REM association is expected to strengthen as information asymmetry increases.

H4. Information asymmetry strengthens the positive association between market power and Modified Real Earnings Management.

Companies facing financial difficulties will find it hard to help external parties understand changes in their operations due to information asymmetry. Thus, it can be assumed that information asymmetry strengthens the relationship between financial distress and REM. However, financial distress itself may prompt companies to engage in REM, making the role of information asymmetry in this relationship an empirical issue.

H5. Information asymmetry strengthens the positive association between financial distress and Modified Real Earnings Management.

Information asymmetry may reduce the effectiveness of institutional monitoring by limiting investors' access to reliable information about managerial operating decisions. Under such conditions, institutional investors may face greater difficulties in identifying and constraining opportunistic real earnings management. Consequently, the negative association between institutional ownership and Modified REM is expected to weaken as information asymmetry increases. However, institutional investors may also respond to greater information risks by intensifying their monitoring efforts, potentially producing an alternative conditional pattern. Because the present study does not directly measure monitoring activities, the interaction between institutional ownership and information asymmetry is interpreted as a conditional association rather than evidence of a specific monitoring mechanism.

H6. As information asymmetry increases, the negative association between institutional ownership and Modified Real Earnings Management becomes weaker.

METHOD

The study population consisted of all non-financial companies listed on the Indonesia Stock Exchange (IDX). To be included in the sample, companies had to be engaged in real production or processing activities. This criterion was applied because the Roychowdhury model relies on the cost of goods sold. The study excluded all financial companies, pure service companies, and pure trading companies; companies whose trading had been suspended for an extended period; companies delisted during the study period; and company-year observations with incomplete data. The final sample comprised a balanced panel of 312 firms observed in 2023 and 2024, yielding a total of 624 firm-year observations. Data from 2022 were used when lagged values or changes were required.

Financial variables were obtained from audited financial statements and their accompanying notes, ownership data were collected from annual reports, and stock-market information was obtained from published market data. The same firm-year sample was retained for the Modified REM and conventional Roychowdhury specifications to ensure that differences in the estimates were not attributable to differences in sample composition.

Table 1

Sample selection

Selection step	Firms
IDX-listed firms at 1 January 2023	825
New listings during 2023	+79
IDX-listed firms at 31 December 2023	904
Less: financial firms	(104)
Less: service businesses	(313)
Less: pure trading businesses	(69)
Less: prolonged suspensions	(100)
Less: delisted during 2023	(1)
Less: incomplete research data	(5)
Final firms	312
Firm-year observations (312 × 2)	624

Note. The selection criteria are applied consistently to construct the balanced panel used in the

regression analyses

The primary dependent variable was Modified Real Earnings Management (Modified REM). This measure extended the conventional Roychowdhury (2006) and Nguyen et al. (2023) composite by incorporating a separately estimated abnormal corporate social responsibility (CSR) expenditure component. Normal operating activities were estimated cross-sectionally within comparable industry-year groups. Each abnormal component was calculated as the residual from its corresponding normal-activity model and standardized before aggregation.

The inclusion of abnormal CSR expenditure in the real-activity composite was justified because discretionary CSR outlays represent real expenditure decisions that managers can accelerate or defer to influence reported earnings, similar to the production and discretionary expenditure decisions examined in the Roychowdhury (2006) and Nguyen et al. (2023) framework. Previous evidence has indicated that firms use CSR-related spending in conjunction with real earnings management (Chouaibi & Zouari, 2022). Treating abnormal CSR expenditure as a separate channel therefore captured a real-activity margin omitted by the conventional composite. The conventional Roychowdhury measure was retained as a benchmark to assess whether the results were sensitive to this extension.

The conventional Roychowdhury model was specified as follows.

$$CFO_{it} / A_{i,t-1} = a0 + a1(1 / A_{i,t-1}) + b1(SALES_{it} / A_{i,t-1}) + b2(\Delta SALES_{it} / A_{i,t-1}) + e_{it} \quad (1)$$

$$PROD_{it} = COGS_{it} + \Delta INV_{it} \quad (2)$$

$$PROD_{it} / A_{i,t-1} = a0 + a1(1 / A_{i,t-1}) + b1(SALES_{it} / A_{i,t-1}) + b2(\Delta SALES_{it} / A_{i,t-1}) + b3(\Delta SALES_{i,t-1} / A_{i,t-1}) + e_{it} \quad (3)$$

$$DISEXP_{it} / A_{i,t-1} = a0 + a1(1 / A_{i,t-1}) + b1(SALES_{i,t-1} / A_{i,t-1}) + e_{it} \quad (4)$$

The residuals from these models represented abnormal operating cash flows (AbnCFO), abnormal production costs (AbnPROD), and abnormal discretionary expenditures (AbnDISEXP), respectively. Lower-than-normal operating cash flows and discretionary expenditures were assigned reversed signs so that they represented income-increasing real earnings management (REM), whereas higher-than-normal production costs retained a positive sign. The conventional Roychowdhury benchmark was calculated as follows:

$$REM_{ROYit} = -Z(AbnCFO_{it}) + Z(AbnPROD_{it}) - Z(AbnDISEXP_{it}) \quad (5)$$

To construct Modified REM, expected CSR expenditure was estimated using lagged CSR expenditure and firm-specific economic characteristics:

$$CSR_{it} / A_{i,t-1} = \alpha_0 + \alpha_1(1/A_{i,t-1}) + \beta_1(CSR_{i,t-1}/A_{i,t-1}) + \beta_2(\Delta SALES_{it}/A_{i,t-1}) + \beta_3 ROA_{it} + \beta_4 SIZE_{it} + \beta_5(CASH_{it}/A_{i,t-1}) + \beta_6 LEV_{it} + \varepsilon_{it}$$

The residual from this model represented abnormal CSR expenditure (AbnCSR). Identifiable CSR expenditure was separated from general discretionary expenditure wherever the reporting data permitted, thereby reducing the risk of double-counting the same expenditure in AbnDISEXP and AbnCSR.

The primary measure was defined as:

$$REM_MOD_it = REM_ROY_it - Z(AbnCSR_it)$$

Higher REM_MOD values indicated greater intensity of income-increasing real-activity deviations, including an abnormal reduction in CSR expenditure relative to its estimated normal level. Conventional REM_ROY was retained as a sensitivity benchmark.

CSR expenditure was measured using separately disclosed corporate social and environmental expenditures reported in firms' annual reports, sustainability reports, and financial statement notes. Observations without identifiable CSR expenditure were treated as missing rather than assigned a zero value. Expected CSR expenditure was estimated within industry-year groups containing sufficient observations, and the resulting abnormal CSR residuals

were standardized before being incorporated into the Modified REM composite. The same final sample was intended to be used in both specifications to ensure comparability.

$$Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$$

where X1 is working capital/total assets, X2 retained earnings/total assets, X3 EBIT/total assets, X4 market value of equity/total liabilities, and X5 sales/total assets. A negative sign is assigned to this score, so a higher FD value indicates an increasing level of difficulty. Specifically, the price-cost margin is computed as

PCM = (Sales − Cost of Goods Sold − Selling, General and Administrative Expenses) / Sales

using figures from the audited income statement, so that higher values indicate greater market power, consistent with the Lerner index interpretation.

Institutional ownership (IO) was measured as the proportion of outstanding shares held by institutional investors at the end of the fiscal year. Information asymmetry (IA) is measured using the annual mean relative bid-ask spread, calculated as (Ask − Bid) / ((Ask + Bid) / 2), where higher values indicate greater information asymmetry. Firm size (SIZE) is measured as the natural logarithm of total assets, leverage (LEV) as total liabilities divided by total assets, and return on assets (ROA) as net income divided by total assets.

Table 2
Variable definitions

Variable	Measurement	Interpretation
REM_MOD	REM_ROY - Z(AbnCSR)	Primary Modified Real Earnings Management measure
REM_ROY	-Z(AbnCFO) + Z(AbnPROD) - Z(AbnDISEXP)	Conventional Roychowdhury sensitivity benchmark
MP	Accounting-based price-cost margin (PCM)	Higher = stronger market power
FD	Negative of Altman Z-score	Higher = greater financial distress
IO	Institutional shares / total shares outstanding	Higher = greater institutional ownership
IA	Annual mean of (Ask-Bid)/((Ask+Bid)/2)	Higher = greater information asymmetry
SIZE	ln(total assets)	Firm-size control
LEV	Total liabilities / total assets	Leverage control
ROA	Net income / total assets	Profitability control

Note. MP, FD, IO, and IA are mean-centered before interaction terms are formed

The determinant and moderation model is estimated as follows:

$$REM_{MODit} = b0 + b1\ MP_{it} + b2\ FD_{it} + b3\ IO_{it} + b4\ IA_{it} + b5(MP \times IA)_{it} + b6(FD \times IA)_{it} + b7(IO \times IA)_{it} + b8\ SIZE_{it} + b9\ LEV_{it} + b10\ ROA_{it} + e_{it} \quad (6)$$

MP, FD, IO, and IA were mean-centered before the interaction terms were constructed. Following mean-centering, the coefficients on MP, FD, and IO represented their respective conditional relationships with REM_MOD at the average level of IA.

The Hausman test supported the use of a fixed-effects model ($\chi^2 = 13.5828$, $p = 0.01928$). Cross-section White robust standard errors were used in the final specification to address cross-sectional heteroscedasticity. The model was first estimated using REM_MOD as the dependent variable and then re-estimated using the conventional REM_ROY measure to assess the sensitivity of the results to the inclusion of abnormal CSR expenditure.

RESULTS AND DISCUSSION

Descriptive statistics

Table 3 presents the descriptive statistics for the variables included in the regression analysis, based on 624 firm-year observations. Modified REM has a mean of 0.0004 and a standard deviation of 2.28, while conventional REM has a mean of 0.0025 and a standard deviation of 2.04. The mean market power (MP) is 0.3423, and institutional ownership (IO) averages 0.59, indicating that institutional investors hold approximately 59% of outstanding shares on average. Information asymmetry (IA), measured by the relative bid-ask spread, has a mean of 0.0119. Financial distress (FD) has a mean of −8.61 because the original Altman Z-score is multiplied by −1, with higher FD values representing greater financial distress.

Table 3

Descriptive statistics (n = 624)

Variable	Mean	SD
REM_MOD	0.0004	2.28
REM_ROY	0.0025	2.04
MP	0.3423	0.1904
FD	-8.61	3.16
IO	0.59	0.22
IA	0.0119	0.0842
SIZE	21.71	1.79
LEV	0.3723	0.2106
ROA	0.0834	0.1030

Note. FD is sign-reversed so that higher values indicate greater financial distress

Main results: Modified Real Earnings Management

Table 4 summarizes the results of the Modified REM regression analysis. Market power has a positive and statistically significant association with Modified REM (coefficient = 4.90; $p < 0.001$). Because information asymmetry (IA) is mean-centered, this coefficient represents the association between market power and Modified REM when IA is at its sample mean, supporting H1. Financial distress also shows a positive and statistically significant association with Modified REM (coefficient = 0.0786; $p = 0.0059$), supporting H2. In contrast, institutional ownership has a negative but statistically insignificant coefficient (coefficient = −0.0590; $p = 0.8098$); therefore, H3 is not supported.

The MP × IA interaction has a positive and statistically significant coefficient (coefficient = 11.19; $p < 0.001$), supporting H4. This indicates that the positive association between market power and Modified REM becomes stronger as information asymmetry increases. In contrast, the FD × IA interaction is positive but statistically insignificant (coefficient = 0.1301; $p = 0.4417$); therefore, H5 is not supported. The analysis consequently provides insufficient statistical evidence that information asymmetry changes the magnitude of the association between financial distress and Modified REM.

The IO × IA interaction is negative and statistically significant (coefficient = −4.32; $p = 0.0089$). Thus, H6 is not supported because the estimated interaction is significant in the opposite direction from that predicted. Since the main effect of IO is not statistically significant, the interaction indicates that the conditional slope of institutional ownership becomes more negative as information asymmetry increases. This finding does not, however, establish the general effectiveness of institutional monitoring or identify a specific monitoring mechanism.

Table 4

Main regression: determinants of Modified Real Earnings Management

Variable	Pred.	Coefficient	p-value	Decision
Constant		-2.33	0.0445	
MP	+	4.90	<0.001	H1 supported
FD	+	0.0786	0.0059	H2 supported
IO	-	-0.0590	0.8098	H3 not supported
IA		-0.4228	0.4680	

Variable	Pred.	Coefficient	p-value	Decision
MP × IA	+	11.19	<0.001	H4 supported
FD × IA	+	0.1301	0.4417	H5 not supported
IO × IA	+	-4.32	0.0089	H6 not supported; opposite direction
SIZE		0.1311	0.0140	
LEV		-0.9101	0.0225	
ROA		-1.54	0.0554	

Note. Dependent variable = REM_MOD. N = 624; R-squared = 0.2045; adjusted R-squared = 0.1916; F = 15.91; Prob(F) < 0.001. Firm fixed effects and White cross-section robust standard errors are used

Sensitivity analysis: conventional Roychowdhury REM

Table 5 compares the results obtained using Modified REM and conventional Roychowdhury REM while maintaining the same sample, explanatory variables, control variables, and estimation approach. The findings indicate that market power and financial distress remain positively and significantly associated with both REM measures, whereas institutional ownership remains statistically insignificant. The interaction between market power and information asymmetry is positive and significant in both specifications, while the interaction between financial distress and information asymmetry remains insignificant. The institutional ownership–information asymmetry interaction is consistently negative and significant. Although differences are observed in coefficient magnitudes and the statistical significance of certain control variables, particularly ROA, the principal hypothesis-testing conclusions remain unchanged. These findings suggest that the reported determinant and moderation patterns are not solely attributable to the inclusion of abnormal CSR expenditure in the Modified REM measure.

Table 5

Sensitivity comparison: Modified REM versus conventional Roychowdhury REM

Variable	REM_MOD coeff.	p-value	REM_ROY coeff.	p-value
Constant	-2.33	0.0445	-2.34	0.0197
MP	4.90	<0.001	4.73	<0.001
FD	0.0786	0.0059	0.0829	0.0008
IO	-0.0590	0.8098	0.0743	0.7257
IA	-0.4228	0.4680	-0.3762	0.4545
MP × IA	11.19	<0.001	12.42	<0.001
FD × IA	0.1301	0.4417	0.1078	0.4601
IO × IA	-4.32	0.0089	-3.62	0.0110
SIZE	0.1311	0.0140	0.1306	0.0046
LEV	-0.9101	0.0225	-0.7658	0.0261
ROA	-1.54	0.0554	-2.05	0.0032
Adjusted R-squared	0.1916		0.1449	
Prob(F)	<0.001		<0.001	
Observations	624		624	

Note. The sample, explanatory variables, controls, interaction construction, and panel-estimation approach are held constant across specifications

Summary of hypothesis tests

Table 6

Hypothesis decisions

Hypothesis	Prediction	Evidence	Decision
H1	MP -> Modified REM (+)	MP = 4.90; p < 0.001	Supported
H2	FD -> Modified REM (+)	FD = 0.0786; p = 0.0059	Supported
H3	IO -> Modified REM (-)	IO = -0.0590; p = 0.8098	Not supported
H4	IA strengthens MP -> Modified REM	MP × IA = 11.19; p < 0.001	Supported

Hypothesis	Prediction	Evidence	Decision
H5	IA strengthens FD -> Modified REM	FD × IA = 0.1301; p = 0.4417	Not supported
H6	IA weakens negative IO -> Modified REM	IO × IA = -4.32; p = 0.0089	Not supported; significant in opposite direction

Note. Hypothesis decisions use the Modified REM specification as the primary test

Discussion

Market power and the conditioning role of information asymmetry

A positive coefficient for market power indicates that firms with greater market power exhibit higher Modified REM values. This result suggests that market power is an important driver of Modified REM, particularly in an environment of average information asymmetry. This finding aligns with the notion that operational flexibility can generate additional potential for tangible change. The significant positive effect of the interaction term between market power and information asymmetry helps the study draw the conclusion that the relationship between market power and the phenomenon described becomes stronger as the level of information asymmetry in that environment increases. This positive association is consistent with Chang et al. (2019), who report that greater market power is associated with more earnings management, and it complements the product-market evidence of Lemma et al. (2018) and Sanusi et al. (2023) in international and emerging-market settings.

These findings should not be interpreted as evidence that market power necessarily causes earnings manipulation. Product-market power may arise from various firm characteristics, including operational efficiency, innovation, or brand strength, while Modified REM is a residual-based measure of deviations from estimated normal operating activities. Accordingly, the results establish a statistically significant association between market power and Modified REM within the observed sample, rather than a causal relationship or direct evidence of managerial intent.

Financial distress as a pressure mechanism

Financial distress is positively and significantly associated with Modified REM, whereas the interaction between financial distress and information asymmetry is not statistically significant. This finding is consistent with the argument that financial pressure may be associated with greater deviations from normal operating activities. Firms experiencing financial difficulties may face incentives to adjust discretionary expenditures, production decisions, or sales-related activities in response to financial constraints. However, the insignificant interaction coefficient does not establish that information asymmetry has no moderating role under all circumstances. Rather, the present analysis does not provide sufficient statistical evidence that information asymmetry significantly changes the association between financial distress and Modified REM within the observed sample.

This assessment is crucial because it helps address common assumptions regarding information asymmetry. In fact, the available evidence challenges the notion that a lack of transparency reinforces all motivations for engaging in REM. While this helps identify conditions under which market power emerges, it does not apply to financial distress in this sample.

Institutional ownership: a conditional association

The results indicate that institutional ownership is not significantly associated with Modified REM at the average level of information asymmetry. This finding suggests that the proportion of shares held by institutional investors alone is insufficient to explain variations in real earnings management within the observed sample. Although previous literature identifies investor characteristics, ownership stability, and monitoring incentives as potentially relevant factors, these dimensions are not directly measured in the present study. Accordingly, the insignificant coefficient should not be interpreted as evidence that institutional ownership is universally ineffective in constraining real earnings management.

The interaction between institutional ownership and information asymmetry is negative and statistically significant ($\beta = -4.32$; $p = 0.0089$), contradicting H6, which predicted that information asymmetry would weaken the negative association between institutional ownership

and Modified REM. Instead, the estimated conditional relationship becomes more negative as information asymmetry increases. This pattern may be consistent with institutional investors responding to information risks through more intensive monitoring; however, the study does not directly measure monitoring activities or investor responses. Therefore, the finding should be interpreted as a statistically significant conditional association rather than evidence of a specific governance mechanism. Future research may examine investor characteristics and monitoring activities to clarify the mechanisms underlying this interaction.

Implications

The theoretical implication is that information asymmetry should not be viewed merely as a uniform driver of earnings management. Rather, its moderating role appears to depend on the economic mechanism underlying Modified REM. For market power, information asymmetry significantly strengthens the positive association with Modified REM. For financial distress, however, the study finds no statistically significant moderating effect. For institutional ownership, the interaction moves in the opposite direction from that predicted, with the conditional association becoming more negative as information asymmetry increases.

The research findings provide insights for investors, lenders, board members, audit committees, and regulatory agencies, as they highlight the need to consider non-standard operational choices in addition to accounting estimates alone. A strong product-market position should not necessarily correlate with a high level of reporting quality, especially when market information frictions are significant. Companies experiencing financial distress warrant close monitoring, regardless of whether the calculated bid-ask spread is high or not, given the strong relationship between such distress and both the Modified REM and the standard Roychowdhury REM. Evaluations of institutional ownership should take into account the effectiveness of the oversight role exercised by investors, rather than merely measuring the proportion of their equity holdings.

CONCLUSION

This study examined market power, financial distress, and institutional ownership as determinants of Modified REM and whether information asymmetry conditions these relationships, using a balanced panel of 624 firm-year observations from 312 production-oriented non-financial firms listed in Indonesia during 2023-2024. Market power and financial distress are positively associated with Modified REM; institutional ownership is insignificant at mean information asymmetry; the MP × IA interaction is positive and significant; the FD × IA interaction is insignificant; and the IO × IA interaction is negative and significant.

These results support a mechanism-specific view of the information environment and are robust to using the conventional Roychowdhury composite. They imply that strong product-market positions and financial distress warrant closer scrutiny of real-activity choices, whereas ownership percentage alone is an incomplete proxy for monitoring quality. The analysis is associational; the design does not identify causal mechanisms, and the interaction results describe conditional associations rather than demonstrated monitoring or manipulation behavior.

There are several limitations to this study. First, the observation period lasted only two years. Second, the Modified REM and standard REM are based on residuals rather than on managers' intentions. Furthermore, the measure of institutional ownership does not account for the type and level of investor involvement; the measure of information asymmetry is based on bid-ask spreads. These limitations restrict the scope of the analysis. Future research could extend the time period and incorporate new measures related to the information environment, thereby distinguishing between types of institutional investors and validating abnormal CSR expenditures as part of Modified Real Earnings Management across time and industries.

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AUTHOR CONTRIBUTION STATEMENT

All authors contributed collaboratively to the development and completion of this research. Their collective contributions included developing the research framework, addressing the research objectives, interpreting the empirical findings, and preparing the manuscript. All authors participated in reviewing and refining the manuscript to maintain consistency among the research objectives, methodological approach, results, discussion, and conclusions. All authors have read and approved the final version of the manuscript and agree to be accountable for the integrity of the published work.

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