

The Relationship between Managerial Ownership and Firm Performance Mediated by Real Earnings Management of Thai IPO Firms

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Abstract: - This study aims to examine the effect of managerial ownership on firm performance, both directly and through real earnings management as a mediating variable, during the pre- and post-initial public offering (IPO) years. Thai quoted companies on the Market for Alternative Investment (MAI) between 2012 and 2017 are analyzed. The findings reveal that before the IPO year, higher managerial ownership exhibits a positive association with firm performance, and this relationship is fully mediated by real earnings management. However, after the IPO, managerial ownership no longer significantly affects firm performance, and real earnings management acts as a mediating variable. These findings highlight the changes in ownership structure during the transition from private to public companies. The decline in managerial ownership post-IPO strongly suggests a potential loss of control and influence, which could impact strategic decisions, financial reporting practices, and operational efficiency. This research adds valuable and important insights to the previous studies on managerial ownership, earnings management practices, and firm performance, offering policymakers, investors, and market participants a better understanding of these dynamics. Nonetheless, it is critical to note that the study's focus on the MAI in Thailand may limit the generalizability of the findings, so further research is strongly advised to be undertaken in diverse markets and contexts.

Key-Words: - managerial ownership, real earnings management, return on assets, initial public offering, Market for Alternative Investment, Thai firms.

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1 Introduction

An initial public offering (IPO) is a crucial aspect for a company to undertake as it transitions from private to public ownership, enabling it to raise capital and provide liquidity to existing shareholders. It widens the shareholder base and enhances the company's visibility. However, going public often results in significant changes in ownership, control, and management. A dispersed ownership structure can dilute the control wielded by existing shareholders, while regulatory requirements can impose burdens on

management executives, potentially leading to a decline in their motivation to do the right thing, [1]. Extensive research consistently demonstrates that IPOs are associated with stock prices and operating underperformance. Several factors contribute to these outcomes, including pre-IPO earnings management by the issuing firm, [2], [3]. As well as the departure of ownership and control following an IPO, which leads to rising agency costs, [4], [5], [6], [7]. The separation of control and ownership gives rise to agency costs as managers may allocate resources in

ways that primarily benefit themselves, disregarding the interests of investors. Such decisions can create conflicts with investors' interests, resulting in agency problems as defined by Jensen and Meckling. To address these challenges, it is crucial to design effective control mechanisms in corporate governance and finance to align managerial actions with shareholder interests, [8]. This helps ensure reliable and comprehensive financial reporting takes place, [9]. Well-structured corporate governance mechanisms, coupled with proper management monitoring of operations and procedures, are expected to reduce earnings management. The corporate governance structure, including ownership structure, has an important role to play in ensuring dependable financial reporting and curtailing earnings management, [10], [11].

Previous research has explored the link between ownership and business performance in the scenario of companies going public. For example, [4], detected a statistically significant and positive association between firstly, operating performance following an IPO and secondly, the level of equity retained by the original entrepreneurs. In, [12], the author discovered that during the post-IPO period, lower levels of insider ownership were related to a substantial deterioration in firm performance. However, prior research on the association between ownership structure and earnings management in IPOs is limited, particularly in Thailand's economy. Existing studies mainly concentrate on examining earnings management through accrual manipulation, which is considered risky as it can be easily detected by auditors. As a result, managers may resort to real earnings management when they fail to meet desired earnings, [13]. Some studies have emphasized the significance of real earnings management in achieving IPO objectives. For instance, [14], found that IPO firms reducing their research and development (R&D) expenses had less insider ownership and higher IPO valuations. This aligns with the observations of, [15], who discovered a negative correlation between changes in R&D expenditure during the IPO year and managerial share sales, suggesting a motive for reducing R&D expenses in line with managerial objectives. Moreover, [16], documented a negative relationship between retained ownership and real earnings management in IPO firms. Indicated here is that increasing levels of retained ownership are related to reduced manipulation of real earnings. Similarly,

[17], conducted a study revealing that issuer parties are involved in real earnings management around the lock-up expiration period. It is possible that this is driven by pre-IPO shareholders' selling incentives.

According to a review of the relevant literature, most studies have primarily focused on examining the direct effect of managerial ownership on firm performance after an IPO. However, as of now, there is no clear consensus on this matter. Therefore, the purpose of this study is to investigate both the direct effect of managerial ownership on firm performance and its influence, mediated through the variable of real earnings management, during the pre-and post-IPO period. The inclusion of real earnings management as a mediator is important as it sheds light on how managerial ownership indirectly affects firm performance and provides valuable insights for various stakeholders, including policymakers, investors, and market participants.

2 Research Paradigm, Literature Review, and Hypotheses Development

The following descriptive intends to explain the research paradigm, which is agency theory. Also, a literature review relating to firm performance during IPO periods, real earnings management, and ownership structures is explained. Finally, hypotheses are illustrated.

2.1 Agency Theory

The study of, [18], proposed that when a firm initially commences its operations, it is typically small in size, and the owners themselves act as managers of the company. However, as the firm grows larger, it requires additional capital to finance its operations. Consequently, the firm sought external funding from the market, leading to the involvement of other investors who provided funds and acquired ownership shares alongside the existing owners. This dispersal of ownership resulted in the appointment of managers to oversee and control the firm's operations, leading to ownership and control becoming separated. This, in turn, can lead to conflicts of interest between management and shareholders, [19]. According to the agency theory, managers and shareholders may have different

objectives, which may very well guide how well a firm performs. Managers may prioritize their interests over maximizing shareholder value, which should be the primary goal. To address this, effective control mechanisms were necessary to ensure managers were acting in the shareholders' best interests. These mechanisms were critical for corporate governance and finance since they contributed to reliable and trusted financial reporting, [8], [9].

One important control mechanism is managerial ownership, where managers own shares in the company. In, [19], the author stated that once managers have a substantial ownership stake, they are more likely to act responsibly, avoiding excessive personal benefits. This is because they bear the costs of such actions in proportion to their shareholdings. High managerial ownership support ensures that managers' and shareholders' interests are aligned, subsequently reducing conflicts and enhancing shareholder value.

2.2 IPO Firm Performance

In, [4], the authors stated that the post-IPO operating performance may decline for several reasons. Firstly, the change from private to public ownership can lift agency costs, with conflicts between former owners and shareholders causing managers to prioritize personal benefits over company success. Secondly, companies may use earnings management practices before they go public, leading to inflated pre-IPO performance and underestimated post-IPO performance. Lastly, IPOs often take place during periods of temporary high performance, which may not be sustainable in the long run. These factors collectively contributed to the possibility of post-IPO operating performance showing signs of decline. Extensive research, including studies by, [4], [20], [21], [22], [23], highlights consistent underperformance of issuing firms in terms of performance and stock returns following IPOs in various countries. Although research specific to Thailand is limited, [6], found similar indications of diminished firm performance for firms quoted on the Stock Exchange of Thailand (SET) after their IPOs.

2.3 Real Earnings Management and IPOs

In, [24], the author stated that real earnings management involves the abandonment of normal

business practices to deceive or mislead stakeholders into expecting that certain financial goals have been achieved through regular operations and procedures. Managers preferred real earnings management strategies because they were less scrutinized by auditors and regulators compared to accrual-based methods. Relying solely on accrual manipulation was seen as risky, prompting managers to turn to real earnings management when desired earnings were not met, [13]. Referring to real earnings management, managers employed strategies like offering higher discounts or extended payment periods to boost revenue of goods and services, overproducing products to reduce costs, and trimming discretionary expenses like advertising, employee training, and research and development, [24], [25].

Previous research has examined the association between IPOs and real earnings management. According to, [15], indicated IPOs decline R&D expenditures in the IPO year to inflate earnings. This reduction was driven by managers' desire to sell shares, as they resisted investors considering current earnings. In, [26], the author discovered that IPO companies were involved in real earnings management practices throughout the IPO year, with reputable venture capitalists acting as a constraint on such behavior. Furthermore, [27], provided evidence of upward earnings manipulation through real earnings management, rather than accrual earnings management, by IPO firms in the UK. The results indicated that there are higher IPO failure rates and poorer post-IPO survival rates.

2.4 Managerial Ownership and IPO firm Performance

Regarding the relationship between managerial ownership and firm performance in IPOs, this association is regularly discussed concerning two key assumptions: the entrenchment hypothesis and the alignment hypothesis. The entrenchment hypothesis suggests that when management holds a majority of shares, it can lead to a decline in operational outcomes as management prioritizes personal gain over the interests of other stakeholders, as, [28], highlights. Conversely, the alignment hypothesis focuses on situations where management holds a significant portion of shares, giving them greater control over the firm. According to this hypothesis, firm performance may improve as managers perceive major shareholding as a means to effectively monitor

operations. According to, [19], argue that substantial management stakes rarely engage in activities that do not benefit the company since they bear the costs in proportion to their shareholdings.

However, currently published analyses on the association between ownership structure changes and firm performance during IPOs produced limited and inconclusive findings. In, [12], the authors discovered a negative relationship between alterations in the level of insider shareholders and those in firm performance during the IPO periods. These findings provide support for the entrenchment hypothesis. In support of the alignment hypothesis, [4], found a positive link between post-IPO performance and equity retention by the original entrepreneurs. Similarly, [6], examined listed companies on the SET and noted that the relationships between performance and managerial ownership varied based on the level of ownership. Businesses characterized by low and high managerial ownership indicated positive associations (supporting the alignment-of-interest hypothesis), while those featuring intermediate ownership levels exhibited negative associations (supporting the entrenchment hypothesis). In their analysis, nevertheless, [1], detected no relationship between changes in directors and officer shareholders concerning IPOs and subsequent firm performance.

Based on the existing literature, we can propose the following hypotheses as follows:

Hypothesis 1: Managerial ownership positively relates to firm performance in the pre-IPO year.

Hypothesis 2: Managerial ownership retention positively relates to firm performance in the post-IPO year.

2.5 Managerial Ownership and Real Earnings Management

Existing literature on earnings management among IPO firms has predominantly concentrated on accrual earnings manipulation, without reference to the manipulation of real business transactions. Nonetheless, recent studies have shed light on the involvement of IPO firms in manipulating real business transactions to achieve their IPO objectives. The research by, [15], examined the correlation between changes in R&D during the offering year and managerial share sales. Their findings revealed a negative correlation, strongly suggesting that IPO

firms may reduce their R&D expenditure to align with managerial share sales objectives. In, [14], the authors discovered a relationship between curtailed R&D spending in IPO firms and a smaller proportion of insider ownership. The results suggest that IPO companies with less insider ownership tend to be involved in real earnings management practices by reducing R&D expenses. Supporting these insights, [29], found a negative relationship between retained shareholders and real earnings management in IPO firms. This outcome further strengthens the alignment hypothesis, thereby suggesting that IPO firms are involved in real earnings management practices to improve their financial performance and achieve specific objectives. Furthermore, [17], documented that issuer parties involve real earnings management in the years following the IPO, particularly around the lockup expiration period. They proposed that this behavior could be related to the selling motivations of pro-IPO shareholders.

Based on the above literature review, we can posit the following hypotheses:

Hypothesis 3: Managerial ownership positively relates to real earnings management in the pre-IPO year.

Hypothesis 4: Managerial ownership retention positively relates to real earnings management in the post-IPO year.

2.6 Ownership Structure, Earnings Management, and IPO Firm Performance

The initial public offering (IPO) is a critical process that allows companies to raise capital while also allowing shareholders to sell their shares. However, extensive research has provided evidence indicating that issuers have the incentive and are able to manipulate income figures, leading to inflated valuations during IPOs, [17], [30], [31]. Several studies have documented instances of earnings management during IPOs to attract investors, [3], [32], [33]. This behavior is primarily driven by the information asymmetry that is evident between issuers and investors. Furthermore, the shift from private to public ownership via IPOs triggers changes in the shareholder structure, resulting in a separation of controls, management, and ownership. A change in ownership can potentially impair management

motivation and has strong ramifications for the overall functioning of IPO firms, [1], [4], [6], [23].

To effectively address the challenges associated with IPOs, it is essential to establish comprehensive governance systems that ensure managers prioritize the interests of shareholders. One potential strategy is to encourage higher degrees of managerial shareholders aligning with shareholder and management interests, leading to reduced agency costs, [19]. When managers possess substantial ownership stakes, they tend to prioritize decisions that maximize shareholder value, thereby improving corporate governance and reducing conflicts of interest. To support this viewpoint, the research undertaken by, [34], [35], provides empirical evidence that the influences of corporate governance on firm performance are mediated by earnings management. Suggested here is that effective corporate governance practices indirectly guide firm performance through earnings management practices.

Based on the information provided, our next two hypotheses are put forward here:

Hypothesis 5: Real earnings management mediates the association between managerial ownership and firm performance in the pre-IPO year.

Hypothesis 6: Real earnings management mediates the association between managerial ownership retention and firm performance in the post-IPO year.

3 Research Methodology

3.1 Dataset

This study scrutinizes the link between managerial ownership, earnings management, and IPO performance. To ensure the up-to-date nature of the empirical evidence and minimize the influence of the COVID-19 pandemic, a thorough analysis was conducted using a preliminary sample of 83 initial public offerings (IPO) firms listed on the Market for Alternative Investment (MAI) in Thailand from 2012 to 2017. The analysis investigated the impact of managerial ownership on IPO performance through the practice of earnings management during the pre- and post-IPO phases. The required data, including company prospectuses and annual reports, was from the online database of the Thai Securities and Exchange Commission, covering the period from

2010 to 2018. To enhance the reliability of the findings, financial industry companies were excluded from the study to eliminate the potential influence of unique working capital structures and additional regulatory governance, aligning with recommendations from previous studies, [36]. Incomplete and outlier data were carefully deleted, resulting in a final sample size of 72 companies.

The primary data analysis technique employed in this study was multiple linear regression. Feasibility tests, such as the F-test and t-test, served to assess the influence between variables and test the research hypotheses. Tests for autocorrelation, normality, heteroscedasticity, and multicollinearity were performed to validate the findings and ensure the robustness of the results.

3.2 Measurement of Variables

3.2.1 IPO Firm Performance

Accounting-based measures are commonly employed for evaluating the performance of IPO firms, particularly in emerging stock markets where stock prices may not fully reflect available information. In the IPO literature, ROA is employed to evaluate the firm performance of IPOs, [4], [6], [7], [32], [37]. ROA measures a company's ability to generate income for all stakeholders relative to its asset base, providing key insights into the efficiency of management in utilizing assets to generate earnings. The calculation of ROA involves dividing core operating activities from before-tax-and-interest operating income by total assets.

3.2.2 Managerial Ownership

Managerial ownership is defined as the number of common shares held by the board of directors and executives. It is calculated by the common stock owned by the board of directors and executives over total common shares. In the post-IPO year, managerial ownership is calculated by the common shares retained by the board of directors and executives who were the original owners after the IPO over total common shares, [38].

3.2.3 Real Earnings Management (REM)

This study employs real earnings management derived from the study by, [39], subsequently utilized by, [13], [24], [40]. This study focuses on analyzing two real earnings management practices: (1) abnormal levels of cash flows from operations due to

sales-based manipulation, and (2) abnormal levels of discretionary expenses resulting from reducing such expenses. To maintain research precision, abnormal production cost manipulation is excluded as a proxy, considering the lower likelihood of younger IPO firms engaging in such practices, [26]. Additionally, a significant portion of the firms incorporated into our sample are operating in the service industry.

Sales manipulation

Sale manipulation is a managerial strategy utilized to achieve a temporary increase in sales within a given year. This approach involves implementing tactics such as price discounts or more lenient credit terms. However, it is important to note that engaging in sales manipulation leads to a subsequent decline in operating cash flows, [24]. To evaluate the normal level of operating cash flows, we initially ran a cross-sectional analysis for the year and industry, considering all non-IPO firms. However, due to the small capital market in MAI, estimating the model on an industry basis was not appropriate. Consequently, we had to aggregate the data from all industries, which is consistent with the approach taken by, [41].

Operating Cash flows are stated as a linear function of sales and change in sales. The model used to estimate the normal level of CFO is:

$$CFO_{it}/A_{it-1} = \alpha_0 + \alpha_1(1/A_{it-1}) + \beta_1(S_t/A_{it-1}) + \beta_2(\Delta S_{it}/A_{it-1}) + \varepsilon_{it} \quad (1)$$

Where CFO_{it} is the operating cash flows of firm i in period t , A_{it-1} is total assets of firm i in year $t-1$, S_{it} is sales of firm i in year t , ΔS_{it} is the change in sales for firm i between year t and year $t-1$, ε_{it} is a residual term capturing the abnormal level of operating cash flows for firm i in year t .

The abnormal CFO for IPO firms can be calculated as the change between the actual CFO and the normal level of CFO, using the coefficients from Equation (1).

Discretionary expenses

Discretionary expenses include R&D costs and selling and administrative expenses. When these expenses abate in the current period, it can make reported earnings and operating cash flows appear higher than they are.

Discretionary expenses are defined as lagged sales, [24]. The model employed to evaluate the normality level of discretionary expenses is:

$$DISEXP_{it}/A_{it-1} = \alpha_0 + \alpha_1(1/A_{it-1}) + \beta(S_{it-1}/A_{it-1}) + \varepsilon_{it} \quad (2)$$

$DISEXP_{it}$ is the sum of R&D expenses and selling and administrative expenses of firm i in year t , while other variables remain as previously defined.

The abnormal discretionary expenses of IPO firms can be calculated as the change between the actual discretionary expenses and the normality level of discretionary expenses, which is valued using the coefficients from Equation (2).

Aggregated real earnings management

To estimate the accumulated amount of REM, we combined abnormal operating cash flows and abnormal discretionary expenses, [26], [27]. The two variables indicate deviations from normal levels and when manipulation occurs they are expected to be negative. Subsequently, we multiplied both variables by -1 and summed them up to create an aggregated REM measure. Indicated by a higher REM value is a greater likelihood of IPO firms engaging in sale manipulation and discretionary expense reduction to boost reported earnings. The model used for estimating REM is:

$$REM = \text{Abnormal CFO}*(-1) + \text{Abnormal DISEXP}*(-1) \quad (3)$$

3.2.4 Control variables Leverage

Leverage can have both positive and negative effects on earnings management. Highly leveraged firms may increase earnings management to avoid breaching debt covenants, [42], while debt issuance can deter opportunistic behaviors, [5]. The debt-to-assets ratio is a crucial leverage metric reflecting a company's reliance on debt. It provides insights into financial stability and management capability, serving as a vital control variable in academic research. Studies by, [6], [43], highlight the relationship between leverage and IPO firms' operating performance. To accurately assess the leverage effect on earnings management and IPO firm performance, the total liabilities to total assets ratio is used as a control variable.

Firm Growth

Revenue growth indicates a company's competitive strength and ability to sustain operations. Diminished

revenue growth signifies a decline in the ability to generate profits, which can deter investor interest. High revenue growth firms tend to engage in earnings management, while those with low revenue growth are more prone to resorting to such practices. In, [17], the authors found no significant relationship between sales growth and real earnings management in the IPO year but negatively associated in the following year. This advises that higher sales growth firms rely less on earnings management, possibly due to improved financial stability. As well, [6], noted better post-IPO performance in growing firms, highlighting a positive link between growth and post-IPO outcomes. Based on this finding, I include a growth variable as a control to address potential firm growth effects.

Firm length of business operation

The existing literature suggests that the age of a business has important implications for performance indicators. Older enterprises typically have well-established management and accounting systems, reflecting the existence of a solid business model and less information asymmetry. This reduces the need for earnings management. Research by, [21], [44], found a positive relationship between age and post-IPO performance, with older firms generally exhibiting better three-year post-IPO stock returns. Contrarily, [45], revealed that young first-starter firms may experience higher underpricing at IPO but demonstrate tougher long-term operating results compared to older businesses. These findings underscore the importance of considering firm age as a control variable to capture potential effects on the variables being studied.

4 Regression Model and Definitions of Variables

To test the above hypotheses, we adopt the following models (Table 1):

Pre-IPO year (year t-1)

$$ROA_{i,t-1} = \alpha_0 + \beta_1 MANG_{i,t-1} + \beta_2 GROWTH_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 AGE_{i,t-1} + IND + YR + \varepsilon_{i,t-1}$$

$$REM_{i,t-1} = \alpha_0 + \beta_1 MANG_{i,t-1} + \beta_2 GROWTH_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 AGE_{i,t-1} + IND + YR + \varepsilon_{i,t-1}$$

$$ROA_{i,t-1} = \alpha_0 + \beta_1 MANG_{i,t-1} + \beta_2 GROWTH_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 AGE_{i,t-1} + \beta_5 REM_{i,t-1} + IND + YR + \varepsilon_{i,t-1}$$

Post-IPO year (year t+1)

$$ROA_{i,t+1} = \alpha_0 + \beta_1 MANG_{i,t+1} + \beta_2 GROWTH_{i,t+1} + \beta_3 LEV_{i,t+1} + \beta_4 AGE_{i,t+1} + IND + YR + \varepsilon_{i,t+1}$$

$$REM_{i,t+1} = \alpha_0 + \beta_1 MANG_{i,t+1} + \beta_2 GROWTH_{i,t+1} + \beta_3 LEV_{i,t+1} + \beta_4 AGE_{i,t+1} + IND + YR + \varepsilon_{i,t+1}$$

$$ROA_{i,t+1} = \alpha_0 + \beta_1 MANG_{i,t+1} + \beta_2 GROWTH_{i,t+1} + \beta_3 LEV_{i,t+1} + \beta_4 AGE_{i,t+1} + \beta_5 REM_{i,t+1} + IND + YR + \varepsilon_{i,t+1}$$

To test the mediating effects according to, [46], we follow these steps. Firstly, the analysis assesses the effect of the independent variables on the dependent variable using the coefficient (c). This effect should be statistically significant. Secondly, the analysis assesses the effect of the independent variable on the mediator variable using the coefficient (a). This effect should also be statistically significant. Thirdly, the analysis assesses the effect of the mediator variable on the dependent variable while controlling for the independent variable using the regression coefficient (b). This effect should be statistically significant. Fourth and finally, the extent of mediation by examining the coefficient (c') of the independent variable is determined, while controlling for the mediator variable. If this coefficient is not statistically significant, it strongly suggests full mediation. If on the other hand, it is significant, it indicates partial mediation. Non-significant coefficients (a or b) suggest no mediation. Figure 1 also summarizes the path analysis of Hypothesis 5 and Hypothesis 6.

Table 1. Variables definition/ Measurement

Acronym	Variables	Definition
ROA	Return on assets	Before-tax-and-interest operating income divided by the total assets
REM	Real earnings management	REM is $AbCFO*(-1) + AbDEX*(-1)$ AbCFO is a residual term from the model employed to evaluate the normal level of CFO AbDEX is a residual term from the model employed to evaluate the normal level of discretionary expenditures.
MANG	Managerial ownership	Common shares held by the board of directors and executives to total common shares before the IPO.
R_MANG	Retention of managerial ownership	Common shares held by the board of directors and executives who were the original owners after the IPO.
GROWTH	Firm growth	Firm growth is measured by dividing the change in revenue by the lagged revenue. To obtain a normal distribution, the Johnson transformation method is used.
LEV	Financial leverage	Total liabilities divided by total assets
AGE	Firm length of business operation	Age in years
YR	Year	The year dummies
INDUS	Industry	The industry dummies

5 Outcomes

5.1 Descriptive Statistics

Descriptive statistics of the variables in the pre- and post-IPO are shown in Table 2. The findings indicate a significant decrease in firm performance after the issuance of securities for the first time. It was found that the average ROA was 11.42% in the pre-IPO year, but it dropped significantly to 6.89% in the post-IPO year. This outcome is in line with, [6]. Furthermore, these consistent patterns of declining firm performance after the initial public offering have been observed in several countries, [1], [22], [23].

Concerning managerial ownership, we noted a marked decrease in average ownership following the initial securities offering. Prior to the IPO, the average managerial ownership was 56.45%, which fell to 40.49% in the year following the IPO. This decrease was measured based on the ownership held by the original owners before the IPO. Moreover, we observed a decline of 15.2% in firm growth and a 20% decrease in leverage between the pre-IPO and post-IPO years. This covers 17 years of normal business operations. In addition, the finding indicates a noteworthy pattern. Before the IPO, the average aggregate real earnings management was -1.75%. However, in the year following the IPO, there was an increase to 0.41%, suggesting a shift towards positive manipulation of earnings. These results shed light on changes in earnings management practices that occur following the IPO.

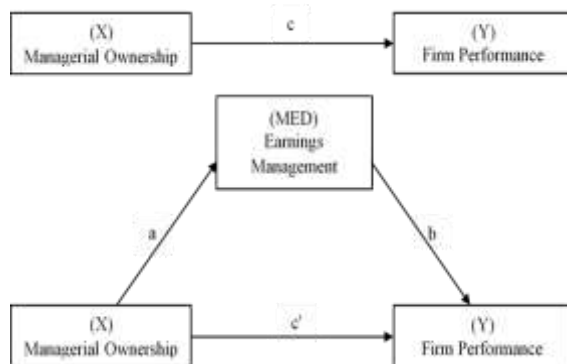


Fig. 1: Path diagram for mediator model

Table 2. Descriptive statistics of variables (n=72)

	Mean			Median			Minimum		Maximum	
	Pre-IPO	Post-IPO	t-Stat for diff	Pre-IPO	Post-IPO	Z-Stat for diff	Pre-IPO	Post-IPO	Pre-IPO	Post-IPO
Return on assets (%)	11.42	6.89	-4.043***	10.03	6.93	-3.900***	-3.78	-12.68	40.05	28.91
Managerial ownership (%)	56.45	40.49	-12.095***	58.14	43.05	-7.104***	0.00	0.00	100	84.65
Firm Growth (%)	19.07	3.87	-0.961	13.86	12.26	-0.701	-236.85	-260.78	361.78	185.88
Leverage (%)	54.47	34.66	-10.715***	53.61	32.43	-6.897***	18.08	2.60	88.08	69.57
Firm length of business operation (years)	16.28	18.28	-13.182***	15.50	17.50	-8.485***	1.00	3.00	34.00	36.00
Abnormal operating cash flows (%)	-2.35	-0.60	0.682	-3.06	-0.47	-.0937	-76.78	-35.24	47.83	34.20
Abnormal discretionary expenses (%)	0.61	1.01	0.427	3.69	2.04	-0.438	-55.59	-37.07	29.63	16.45
Real earnings management (%)	-1.75	0.41	0.808	-1.51	1.74	-0.819	-84.22	-34.53	75.57	50.65

*, **, and *** indicate .10, .05, and .01 significance levels, respectively.

Table 3. Correlation matrix of variables

Panel A. Pre-IPO year (Year -1)

	ROA	MANG	GROWTH	LEV	AGE	REM	VIF
ROA	1						
MANG	.227*	1					1.516
GROWTH	.026	-.095	1				1.484
LEV	-.521***	.006	.234**	1			1.360
AGE	-.008	.134	-.013	-.073	1		1.409
REM	-.453***	-.217*	-.228*	.078	-.082	1	1.674

Panel B. Post-IPO year (Year +1)

	ROA	MANG	GROWTH	LEV	AGE	REM	VIF
ROA	1						
MANG	.117	1					1.336
GROWTH	.387***	.054	1				1.335
LEV	-.163	.017	.245**	1			1.249
AGE	.022	.203*	-.048	-.036	1		1.613
REM	-.367***	-.062	-.093	.081	.267**	1	1.544

*, **, and *** indicate .10, .05, and .01 significance levels, respectively

5.2 Correlation Matrix

Correlation coefficients between variables in the pre-IPO year (Year -1) and post-IPO year (Year +1) are shown in Table 3. In the pre-IPO year, the analysis reveals positive correlations between managerial ownership (MANG) and return on assets (ROA) ($r = .227$), suggesting that as MANG increases, ROA is likely to increase as well. Furthermore, MANG exhibits a negative correlation with real earnings management (REM) ($r = -.217$), indicating that when MANG increases, there is a probability of REM decreasing. Additionally, REM shows a significant negative

correlation with ROA ($r = -.453$) at the .01 level of significance, indicating that a decrease in REM is significantly associated with an increase in ROA.

In the post-IPO year, a positive correlation between managerial ownership retention (R_MANG) and ROA ($r = .117$) was observed. This indicated that as the level of managerial ownership retention decreases, the ROA tends to decrease as well. In addition, R_MANG exhibited a negative correlation with REM ($r = -.062$), suggesting that a reduction in managerial ownership is associated with an increased likelihood of an increase in REM. Furthermore, REM shows a significant negative correlation with ROA ($r = -.453$) at the .01

level of significance, implying that an increase in REM is significantly linked to a decrease in ROA.

Importantly, Table 3 shows that there is no significant issue of multicollinearity among the variables under investigation, as evidenced by coefficients that are not greater than .90, [47]. To further examine multicollinearity, variance inflation factors (VIFs) were calculated. According to, [47], multicollinearity is generally considered problematic when the VIF value exceeds 10. However, in this study, all the VIF reported in Table 3 are below 2, suggesting the absence of multicollinearity in the model.

5.3 Multivariate Analyses

Table 4 presents a comparative analysis and it examines the effects of managerial ownership and real earnings management on firm performance, specifically focusing on evaluating the mediator in the pre-IPO year. In Model 1 of Table 4, the result shows that managerial ownership (MANG) is significantly and positively associated with firm performance. Therefore, Hypothesis 1 is supported and indicates that higher levels of managerial ownership firms tend to exhibit better performance. Additionally, the analysis of control variables indicates that lower levels of leverage firms tend to show higher firm performance.

Model 2 in Table 4 shows that managerial ownership (MANG) significantly and negatively relates to real earnings management (REM). This result supports Hypothesis 3, representing that

firms with higher levels of managerial ownership tend to engage in downward real earnings management. In addition, the analysis of control variables confirms that firms with lower revenue growth tend to appear upward in real earnings management to meet their earnings targets, which can affect the offering price IPO.

Lastly, Model 3 reveals that real earnings management (REM) negatively relates to ROA. This result suggests that lower levels of real earnings management are associated with superior firm performance. Furthermore, the regression coefficient of managerial ownership (MANG), denoted as “c’,” has no statistically significant effect on ROA. This finding suggests that real earnings management (REM) fully mediates the association between managerial ownership (MANG) and ROA.

To confirm the significance of the indirect effect and the mediating role of real earnings management, the Sobel Test, [48], was employed. The results, as presented in Table 5, indicate a statistically significant Sobel Test value of 1.986 ($p = 0.047$). Therefore, the results of the Sobel Test confirm that managerial ownership has a statistically significant indirect effect on ROA through real earnings management, so Hypothesis 5 is supported here.

Table 4. The relationship of managerial ownership, real earnings management, and firm performance in the pre-IPO year (Year -1)

Independent Variables	Model 1: ROA			Model 2: REM			Model 3: ROA		
	B	Beta	p-value	B	Beta	p-value	B	Beta	p-value
Constant	27.505		0.000***	-0.039		0.748	26.959		0.000***
MANG	0.052	0.215	0.040**	-0.002	-0.295	0.018**	0.026	0.110	0.267
GROWTH	0.954	0.132	0.195	-0.062	-0.303	0.014**	0.178	0.025	0.801
LEV	-24.834	-0.549	0.000***	0.207	0.162	0.178	-22.245	-0.492	0.000***
AGE	-0.167	-0.173	0.098	0.002	0.088	0.472	-0.137	-0.142	0.139
REM							-12.503	-0.354	0.001***
Year Dummy			Yes			Yes			Yes
Industry Dummy			Yes			Yes			Yes
Adjusted R ²			0.461			0.243			0.548
F-statistic			5.053			2.517			6.386
p-value			0.000			0.006			0.000
Durbin-Watson			2.057			2.113			1.981
Maximum-VIF			1.952			1.909			1.977
Observations			72			72			72

*, **, and *** indicate .10, .05, and .01 significance levels, respectively.

Table 5. Mediation testing by Sobel, Aroian, and Goodman test

Test	REM	
	Test Statistics	p-value
Sobel test	1.986	0.047**
Aroian test	1.933	0.053*
Goodman test	2.045	0.041**

*, **, and *** indicate .10, .05, and .01 significance levels, respectively.

Table 6. The effects of managerial ownership on firm performance through real earnings management in the pre-IPO year (Year -1)

Effects	Path	Beta	SE	t	p-value
Direct effect	MANG -> ROA	0.110	0.024	1.122	0.267
Indirect effect	MANG -> REM	-0.295	0.001	-2.436	0.018**
	REM -> ROA	-0.354	3.643	-3.432	0.001***
Total effect	MANG > ROA	0.215	0.025	2.104	0.040**

*, **, and *** indicate .10, .05, and .01 significance levels, respectively.

To confirm the significance of the indirect effect and the mediating role of real earnings management, the Sobel Test, [48], was employed. The results, as presented in Table 5, indicate a statistically significant Sobel Test value of 1.986 ($p = 0.047$). Therefore, the results of the Sobel Test confirm that managerial ownership has a statistically significant indirect effect on ROA through real earnings management, so Hypothesis 5 is supported here.

Therefore, it can be concluded that the influence of managerial ownership on ROA is solely mediated by real earnings management. In other words, the effect of managerial ownership on ROA is not direct but instead operates through the intermediary of real earnings management. To summarize the effects, Table 6 provides an overview of all effects (indirect, indirect, and total effect). Table 7 presents a comparative analysis that examines the effects of managerial ownership retention and real earnings management on firm performance, specifically focusing on the mediator in the post-IPO year.

Model 1 shows that no statistically significant association between managerial ownership retention (R_MANG) and ROA is found. This result does not support Hypothesis 2, suggesting no significant effect of managerial ownership retention on ROA. However, the analysis of the control variables indicates that higher revenue growth firms (GROWTH) and lower leverage firms (LEV) tend to exhibit higher levels of ROA. Similarly, Model 2 shows no statistically significant

relationship between managerial ownership retention (R_MANG) and real earnings management. So, this result does not support Hypothesis 4, suggesting no significant relationship between managerial ownership retention and real earnings management is found. Nonetheless, it is important to note that firms with longer operational histories (AGE) exhibit high real earnings management. This means that firms with more experience are more likely to engage in upward earnings manipulation after an IPO period. Model 3 indicates a negative association between real earnings management (REM) and ROA. However, the regression coefficient of managerial ownership retention (R_MANG), denoted as "a", does not exhibit the influence of real earnings management (REM), which does not align with Baron and Kenny, [46]. It can be concluded as a result that real earnings management (REM) is not a mediator in the association between managerial ownership retention (R_MANG) and ROA. Thus, Hypothesis 6 is not supported.

In summary, based on the analysis conducted, the results suggest no evidence of a direct or indirect effect of real earnings management (REM) on the association between managerial ownership retention (R_MANG) and ROA. Table 8 shows the summary of the examination of the direct, indirect, and total effects of managerial ownership retention, ROA, and real earnings management.

Table 7. The relationship of managerial ownership, real earnings management, and firm performance in the post-IPO year (Year +1)

Independent Variables	Model 1: ROA			Model 2: REM			Model 3: ROA		
	B	Beta	p-value	B	Beta	p-value	B	Beta	p-value
Constant	7.124		0.027**	-0.162		0.021**	3.637		0.219
MANG	-9.954	0.087	0.510	0.000	-0.017	0.893	0.021	0.079	0.504
GROWTH	0.024	0.458	0.001***	-0.002	-0.013	0.917	3.295	0.451	0.000***
LEV	3.342	-0.262	0.043**	0.035	0.039	0.744	-9.210	-0.243	0.346
AGE	0.029	0.037	0.787	0.007	0.370	0.005***	0.177	0.220	0.092*
REM							21.506	-0.497	0.000***
Year Dummies			Yes			Yes			Yes
Industry Dummies			Yes			Yes			Yes
Adj. R ²			0.083			0.179			0.272
F-statistic			1.426			2.032			2.659
p-value			0.168			0.029			0.004
Durbin-Watson			2.161			2.088			1.942
Maximum-VIF			1.858			1.858			1.751
Observations			72			72			72

*, **, and *** indicate .10, .05, and .01 significance levels, respectively.

Table 8. The effects of managerial ownership on firm performance through real earnings management in the post-IPO year (Year +1)

Effects	Path	Beta	SE	t	p-value
Direct effect	MANG -> ROA	0.087	0.036	0.663	0.510
Indirect effect	MANG -> REM	-0.017	0.001	-0.135	0.893
	REM -> ROA	-0.497	5.448	-3.948	0.000***
Total effect	MANG -> ROA	0.079	0.032	0.673	0.504

*, **, and *** indicate .10, .05, and .01 significance levels, respectively.

6 Discussion

This study offers valuable insights into how managerial ownership, real earnings management, and firm performance are related, with a specific focus on the pre-and post-IPO periods. Through careful data analysis, our findings align with the existing literature, confirming the notion that going public often results in a reduction of managerial ownership and a decline in firm performance, [1], [4], [6]. In addition, our findings reveal a shift in the practices of real earnings management towards more positively oriented manipulation after the IPO, signaling a change in how earnings are managed following the transition to a public company.

In addition, the results indicate that managerial ownership has a positive association with ROA and a negative association with real earnings management before an IPO. This finding suggests that higher levels of managerial ownership are linked to enhanced financial performance and a downward trend in real earnings management. Furthermore, the mediation analysis demonstrates that real earnings management fully mediates the

association between managerial ownership and ROA. These results suggest that managerial ownership has an indirect effect on ROA through its impact on real earnings management. However, the study indicates that after an IPO, retaining managerial ownership no longer significantly impacts ROA. This finding aligns with [1], but contradicts, [4]. One possible explanation for this disparity may be the varying methods used to gauge ownership retention. Our study directly measures it as the percentage of shares retained by directors and executives, whereas, [4], measures it as the percentage of shares retained by shareholders prior to the offering. Additionally, it has been revealed that retaining managerial ownership no longer significantly impacts real earnings management, contrary to the observation, [9], where a negative relationship between retained shareholders and real earnings management was found in Malaysian IPO firms.

This difference might be due to the proportion of share ownership held by the original owners at the management level dropping, potentially affecting their control and influence over real

earnings management. Additionally, real earnings management no longer serves as a mediating factor in the relationship between managerial ownership retention and firm performance. This may indicate that the transition from a private to a public company can significantly reduce managerial ownership, which in turn affects management control, the quality of financial reporting, and ultimately the operational efficiency of the company after its IPO.

Based on the findings of this study, regulatory bodies overseeing registered companies should monitor and control the sale of shares by managerial shareholders during the IPO period. This issue is of great importance because it has significant implications for corporate governance, strategic decision-making, financial reporting, and operational efficiency. Furthermore, companies prepared to go public on the stock market can utilize these results to enhance their internal governance mechanisms. These actions play a vital role in building confidence in financial accuracy, reflecting true operational performance, and promoting sustainable long-term growth.

7 Conclusion

This study investigates the influence of managerial ownership on firm performance with an emphasis on the mediating role of real earnings management, specifically in the context of initial public offerings (IPOs). The significant findings reveal that in the pre-IPO year, higher levels of managerial ownership are more likely to lead to better firm performance. Furthermore, real earnings management fully mediates this relationship. However, in the post-IPO year, the study suggests that retaining managerial ownership no longer significantly affects firm performance. Furthermore, real earnings management no longer plays a role as a mediating variable between managerial ownership retention and firm performance.

The study highlights the significance of ownership structure during the transition from privately held to publicly traded companies. As the original owners' control and oversight diminish due to a decline in their proportion of shares, it may have important ramifications for the quality of financial reporting and operational efficiency post-IPO. This finding makes valuable contributions to the existing academic literature on managerial ownership, earnings management, and firm performance, particularly concerning start-up

companies that wish to go public. Understanding the mediating role of real earnings management provides crucial insights for policymakers, investors, and market participants when evaluating the impact of managerial ownership on a company's financial performance during the pre- and post-IPO periods. It is important to acknowledge that this study is limited to firms listed in an emerging country. Further research is encouraged to explore the generalizability of these findings to other markets and contexts, thus enhancing our understanding of the complex interplay between managerial ownership, firm performance, and earnings management.

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