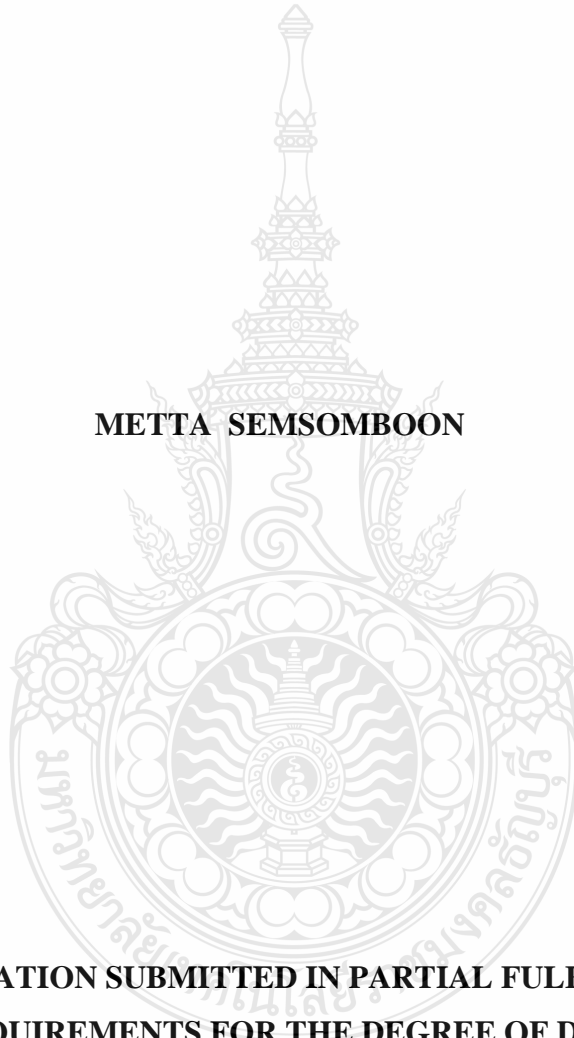


**MEDIATING ROLE OF EARNINGS MANAGEMENT
IN THE ASSOCIATION BETWEEN OWNERSHIP STRUCTURE
AND FIRM PERFORMANCE: EVIDENCE FROM THAI IPO FIRMS**

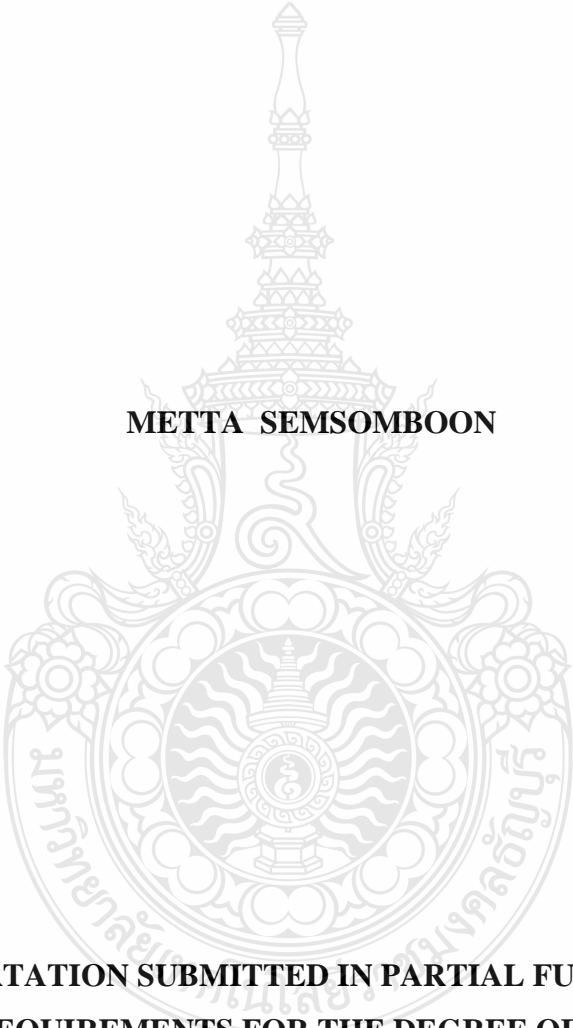
METTA SEMSOMBOON



**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY PROGRAM IN BUSINESS ADMINISTRATION
FACULTY OF BUSINESS ADMINISTRATION
RAJAMANGALA UNIVERSITY OF TECHNOLOGY THANYABURI
ACADEMIC YEAR 2023
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OF TECHNOLOGY THANYABURI**

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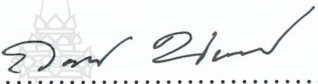
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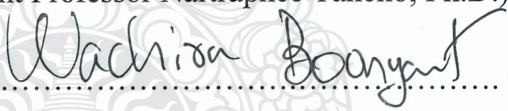
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ABSTRACT

This research aimed to study: 1) the association of ownership structures on earnings management and firm performance in the pre-IPO year, 2) the impact of changes in ownership structure on earnings management and firm performance during and after the IPO year, and 3) the mediating role of earnings management in the association between ownership structures and firm performance. Firm performance was assessed based on the accounting performance measured by return on assets (ROA) and return on equity (ROE). Earnings management was evaluated using two measures: real earnings management (REM) and accrual-based earnings management (AEM). Ownership structures, including ownership concentration and managerial ownership, were considered. The samples consisted of 72 firms listed on the Market for Alternative Investment (MAI) from 2012 to 2017. The statistical methods used to analyze the data included multiple linear regression and Baron and Kenny's method (1986) for analyzing mediation hypotheses.

The results indicate that ownership concentration has no association with earnings management and firm performance during the IPO period. This implies that the largest shareholders do not directly influence the earnings management and the company performance, both before and after the IPO. This could be because companies encounter stricter reporting requirements and greater regulatory scrutiny during the IPO phase, limiting the influence of large shareholders on the company financial results and strategies. However, the analysis demonstrates that in the pre-IPO year, higher managerial ownership is associated with improved operating performance and reduced

REM behavior. This aligns with the alignment hypothesis, which reduces agency costs and mitigates executive misconduct (REM) behavior helping businesses achieve better operational results. The mediation analysis provides additional insights, showing that REM fully mediates the relationship between managerial ownership and ROA, while partially mediating the relationship between managerial ownership and ROE. However, after the IPO, the retention of managerial ownership does not show a significant relationship between earnings management and firm performance. REM no longer serves as a mediating variable. These findings illuminate changes in ownership structure during the transition from private to public companies. The decline in managerial ownership following the IPO clearly highlights the potential loss of control and influence, which impacts the practices of earnings management and operational efficiency, as stated in the agency theory.

This study contributes valuable and significant perspectives to the existing body of research concerning ownership structure, earnings management, and firm performance. It enhances the comprehension of these dynamics for policymakers, investors, and market stakeholders. However, it is important to acknowledge that this study focuses on MAI in Thailand, which might restrict the applicability of the results. Consequently, it is highly recommended that additional research be conducted in various markets and situations to broaden the scope of understanding.

Keywords: managerial ownership, real and accrual earnings management, firm performance, initial public offering, Market for Alternative Investment

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Metta Semsomboon

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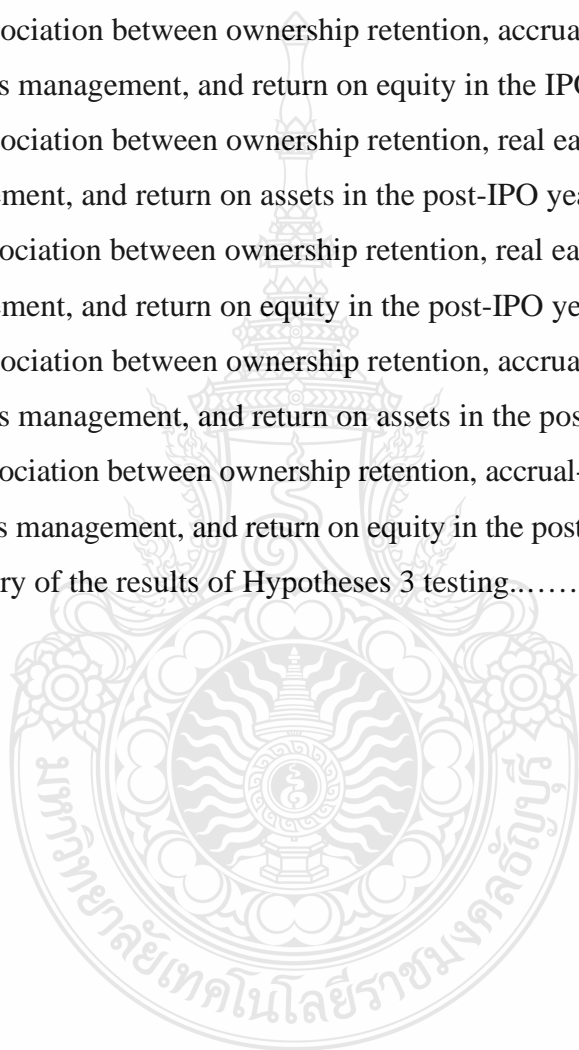
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CHAPTER 1

INTRODUCTION

1.1 Background and Significance of the Research

An Initial Public Offering (IPO) represents a turning point in a company's transition from private to public ownership. It involves a company's debut on the stock market and provides them with the opportunity to obtain funds from the general public, which can be utilized to expand their operations or improve their competitive advantage in a given industry. This form of capital raising offers flexibility in financial management, as the company does not have to repay the principal and interest within a specific timeframe, as is the case with loans from financial institutions. According to Daily, Certo, Dalton, and Roengpitya (2003), the initial public offering was one of the most important steps in the development of a company, which is a preliminary strategy to change and improve the organization rapidly. Being listed on the stock exchange also serves to enhance the credibility and image of a company's management and operating standards through the disclosure of information mandated by the Stock Exchange of Thailand (SET). This instills confidence among investors to invest in the company's securities, fostering trust, honesty, reliability and good dealings among both Thai and foreign customers and partners (Stock Exchange of Thailand, 2018).

Certain studies have consistently shown that IPOs are associated with lower stock prices and poor performance (Rangan, 1998; Siew Hong Teoh, Ivo Welch, & Tak J Wong, 1998a). Many factors contribute to these results, including the manipulation of earnings during the IPO and the subsequent separation of ownership and control, giving rise to agency-related issues. The reason is that managers often allocate resources primarily for their own gain, frequently overlooking the interests of investors. Such decisions can generate conflicts of interest with investors, leading to agency problems. Effectively addressing these issues necessitates the development of robust control mechanisms for corporate and financial governance, ensuring that management's actions align with the shareholders' interests. This, in turn, can mitigate agency-related problems and enhance transparency or full disclosure. The implementation of effective corporate governance mechanisms, encompassing ownership structure, is of pivotal importance in

ensuring compliance with financial reporting standards and bolstering the reliability of financial statements (Bushman & Smith, 2003). These mechanisms have a substantial impact on the incentives to oversee and regulate how the company is managed (Morck, Shleifer, & Vishny, 1988).

Previous studies have investigated the relationship between ownership and firm performance during their transition to listed companies. For instance, Jain and Kini (1994) identified a significantly positive relationship between performance after the IPO and the level of equity retained by the original entrepreneurs. Mayur, Kumar, and Mahakud (2007) observed that lower insider ownership is associated with a significant decline in performance after the IPO. However, Mikkelsen, Partch, and Shah (1997) found no relationship between changes in managerial ownership around IPOs and firm performance. Other studies have explored the connection between ownership and earnings management during the IPO. For example, Purayil and Lukose (2019) discovered that management's incentives for IPO profits are related to the sales incentives of existing shareholders or initial owners. Fan (2007) identified an inverse relationship between earnings management in IPO firms and the level of ownership retained by pre-IPO shareholders. When insiders retain more shares, it becomes more expensive for issuer firms to engage in earnings management, leading to better quality earnings reporting. Kalgo, Nordin, Nahar, and Turmin (2016) also reported that retained ownership is negatively associated with real earnings management, which supports the alignment hypothesis.

Based on a review of the literature on the ownership structure and operating performance during the transition from private to public entities in emerging market economies, including Thailand, it was found that analyses of this topic are still limited. Most existing studies have focused on the direct influence of ownership structure on corporate performance in the period following its initial public offering (IPO). However, no conclusive conclusions have been reached. Thus, this study aims to expand the existing literature by examining both the direct influence of ownership structure on firm performance and the indirect influence through earnings management during the initial public offering period. This comprehensive review will provide a clearer understanding of how changes in ownership structure affect corporate performance and earnings

management. It is essential to include earnings management variables as mediators to effectively explain the relationship between ownership structure and firm performance.

This study delves into the specific context of initial public offerings (IPOs) in the Thai stock market, focusing on the market for alternative investments (MAI). This emphasis arises from the fact that more than 90% of businesses in Thailand are in the category of small and medium-sized enterprises (SMEs), playing a crucial role in propelling the country's economic growth. The research is of substantial value for SMEs aspiring to be publicly listed and for various stakeholders, including policymakers, investors, and stock market participants. It makes it possible to assess the influence of ownership on firm performance in both the pre- and post-IPO periods.

1.2 Research Questions

The aforementioned background leads to the research questions being posited:

1. What is the association between pre-IPO ownership structure, earnings management, and firm performance?
2. How do changes in the post-IPO ownership structure affect earnings management and firm performance?
3. Does earnings management mediate the association between ownership structure and firm performance?

1.3 Purpose of the Research

With the attempt to answer and clarify the research questions, the purposes of this study are as follows:

1. To examine how ownership structures with earnings management are associated with firm performance in the pre-IPO year.
2. To examine the impact of changes in ownership structure on earnings management and firm performance during and after the IPO year.
3. To investigate the mediating effects of earnings management in the association between ownership structures and firm performance.

1.4 Research Hypothesis

The hypotheses of the study are based on the theoretical framework. There are three hypotheses proposed for this study:

Hypothesis 1: Ownership structure is positively associated with firm performance.

Hypothesis 1.1: Ownership structure is positively associated with firm performance in the pre-IPO year.

Hypothesis 1.1a: Ownership concentration is positively associated with return on assets in the pre-IPO year.

Hypothesis 1.1b: Ownership concentration is positively associated with return on equity in the pre-IPO year.

Hypothesis 1.1c: Managerial ownership is positively associated with return on assets in the pre-IPO year.

Hypothesis 1.1d: Managerial ownership is positively associated with return on equity in the pre-IPO year.

Hypothesis 1.2: The retention of ownership structure is positively associated with firm performance in the IPO year.

Hypothesis 1.2a: The retention of ownership concentration is positively associated with return on assets in the IPO year.

Hypothesis 1.2b: The retention of ownership concentration is positively associated with return on equity in the IPO year.

Hypothesis 1.2c: The retention of managerial ownership is positively associated with return on assets in the IPO year.

Hypothesis 1.2d: The retention of managerial ownership is positively associated with return on equity in the IPO year.

Hypothesis 1.3: The retention of ownership structure is positively associated with firm performance in the post-IPO year.

Hypothesis 1.3a: The retention of ownership concentration is positively associated with return on assets in the post-IPO year.

Hypothesis 1.3b: The retention of ownership concentration is positively associated with return on equity in the post-IPO year.

Hypothesis 1.3c: The retention of managerial ownership is positively associated with return on assets in the post-IPO year.

Hypothesis 1.3d: The retention of managerial ownership is positively associated with return on equity in the post-IPO year.

Hypothesis 2: Ownership structure is negatively associated with earnings management.

Hypothesis 2.1: Ownership structure is negatively associated with earnings management in the pre-IPO year.

Hypothesis 2.1a: Ownership concentration is negatively associated with real earnings management in the pre-IPO year.

Hypothesis 2.1b: Ownership concentration is negatively associated with accrual-based earnings management in the pre-IPO year.

Hypothesis 2.1c: Managerial ownership is negatively associated with real earnings management in the pre-IPO year.

Hypothesis 2.1d: Managerial ownership is negatively associated with accrual-based earnings management in the pre-IPO year.

Hypothesis 2.2: The retention of ownership structure is negatively associated with earnings management in the IPO year.

Hypothesis 2.2a: The retention of ownership concentration is negatively associated with real earnings management in the IPO year.

Hypothesis 2.2b: The retention of ownership concentration is negatively associated with accrual-based earnings management in the IPO year.

Hypothesis 2.2c: The retention of managerial ownership is negatively associated with real earnings management in the IPO year.

Hypothesis 2.2d: The retention of managerial ownership is negatively associated with accrual-based earnings management in the IPO year.

Hypothesis 2.3: The retention of ownership structure is negatively associated with earnings management in the post-IPO year.

Hypothesis 2.3a: The retention of ownership concentration is negatively associated with real earnings management in the post-IPO year.

Hypothesis 2.3b: The retention of ownership concentration is negatively associated with accrual-based earnings management in the post-IPO year.

Hypothesis 2.3c: The retention of managerial ownership is negatively associated with real earnings management in the post-IPO year.

Hypothesis 2.3d: The retention of managerial ownership is negatively associated with accrual-based earnings management in the post-IPO year.

Hypothesis 3: Earnings management mediates the association between ownership structure and firm performance.

Hypothesis 3.1: Earnings management mediates the association between ownership structure and firm performance in the pre-IPO year.

Hypothesis 3.1a: Real earnings management mediates the association between ownership concentration and return on assets in the pre-IPO year.

Hypothesis 3.1b: Real earnings management mediates the association between managerial ownership and return on assets in the pre-IPO year.

Hypothesis 3.1c: Real earnings management mediates the association between ownership concentration and return on equity in the pre-IPO year.

Hypothesis 3.1d: Real earnings management mediates the association between managerial ownership and return on equity in the pre-IPO year.

Hypothesis 3.1e: Accrual-based earnings management mediates the association between ownership concentration and return on assets in the pre-IPO year.

Hypothesis 3.1f: Accrual-based earnings management mediates the association between managerial ownership and return on assets in the pre-IPO year.

Hypothesis 3.1g: Accrual-based earnings management mediates the association between ownership concentration and return on equity in the pre-IPO year.

Hypothesis 3.1h: Accrual-based earnings management mediates the association between managerial ownership and return on equity in the pre-IPO year.

Hypothesis 3.2: Earnings management mediates the association between the retention of ownership and firm performance in the IPO year.

Hypothesis 3.2a: Real earnings management mediates the association between the retention of ownership concentration and return on assets in the IPO year.

Hypothesis 3.2b: Real earnings management mediates the association between the retention of managerial ownership and return on assets in the IPO year.

Hypothesis 3.2c: Real earnings management mediates the association between the retention of ownership concentration and return on equity in the IPO year.

Hypothesis 3.2d: Real earnings management mediates the association between the retention of managerial ownership and return on equity in the IPO year.

Hypothesis 3.2e: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on assets in the IPO year.

Hypothesis 3.2f: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on assets in the IPO year.

Hypothesis 3.1g: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on equity in the IPO year.

Hypothesis 3.2h: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on equity in the IPO year.

Hypothesis 3.3: Earnings management mediates the association between the retention of ownership and firm performance in the pre-IPO year.

Hypothesis 3.3a: Real earnings management mediates the association between the retention of ownership concentration and return on assets in the post-IPO year.

Hypothesis 3.3b: Real earnings management mediates the association between the retention of managerial ownership and return on assets in the post-IPO year.

Hypothesis 3.3c: Real earnings management mediates the association between the retention of ownership concentration and return on equity in the post-IPO year.

Hypothesis 3.3d: Real earnings management mediates the association between the retention of managerial ownership and return on equity in the post-IPO year.

Hypothesis 3.3e: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on assets in the post-IPO year.

Hypothesis 3.3f: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on assets in the post-IPO year.

Hypothesis 3.3g: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on equity in the post-IPO year.

Hypothesis 3.3h: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on equity in the post-IPO year.

1.5 Theoretical Perspectives

In this study we briefly explain the theoretical perspective as follows:

1.5.1 Agency Theory

Agency theory was a concept first put forward by Jensen and Meckling (1976). The theory describes the agency relationship as a contract under which one party (the principal) engages another party (the agent) to execute some service on their behalf. As part of this, the principal will delegate some decision-making authority to the agent. Occasionally, the agents may take decisions that serve their own interests. Thus, the principal has to offer incentives to the agent and incur monitoring costs to limit the agent's activities. Agency theory was developed to understand and restrict possible agency costs, which arise when the interests of the shareholder/owner interests of the principal do not align with those of the manager (agent) (Brealey, Myers, Allen, & Mohanty, 2012).

The main perspective of agency theory is to understand the issue of corporate governance and earnings management. Jensen and Meckling (1976) specified that an agency problem arose within the firm when conditions of separation of ownership and control emerged and caused problems. This could occur through various mechanisms, such as opening to public investment through stock market listing and hiring of a professional manager for a family firm (Jensen & Meckling, 1976). Jain and Kini (1994)

and Kim, Kitsabunnarat, and Nofsinger (2004) argued that the separation of ownership and control after IPOs are issued, leads to increased agency costs. Because of the difference in ownership and control, managers may allocate resources to the activities that presumably benefit them, regardless of the investors' interests. Such managers' decisions conflict with investors' interests and may lead to agency problems as defined by Jensen and Meckling.

1.5.2 Asymmetric Information

The concept of asymmetric information proposed by Akerlof (1970) involves a situation in which one party possesses or will possess a higher level of knowledge compared to another party regarding their own traits or behaviors. This unequal distribution of information is notably evident in initial public offerings (IPOs), where potential investors have substantially less knowledge compared to security owners. Current owners of the company have access to extensive information regarding the company's internal operations, its future economic potential such as greater market share, and the industriousness of its management and employees (Leland & Pyle, 1977).

This information asymmetry can create challenges for external investors seeking to make informed decisions about whether to invest in the company. It can also potentially lead to the occurrence of earnings management, or the manipulation of financial statements to present a more favorable financial picture. If external investors are more reliant on financial statements and other publicly available information when making investment decisions, they may be more vulnerable to the effects of earnings management. As a result, information asymmetry can be an important factor to consider when evaluating the IPO process and its ramifications for firm performance.

1.5.3 Signaling Theory

Signaling theory, as originally presented by Spence (1973), posits that investors use the information they possess to make decisions about purchasing securities. Given the inherent variability in information among individual investors, those within a firm typically have more comprehensive information. It is anticipated, within the theoretical perspective framework, that a firm seeking to issue securities will employ various methods to signal the quality of the company. This signaling aims to attract external investors to participate in its IPOs. Several studies, including Brau and Johnson (2009),

have employed signaling theory. They discovered evidence indicating that IPO firms strategically choose prestigious third-party certifiers to signal firm good quality. These certifiers, namely auditors, underwriters, attorneys, and venture capitalists, are collectively called third-party certifiers. Fan (2007) suggests that ownership retention serves as a potential signal for firm value, and IPO firms convey quality signals through a combination of ownership retention and reported earnings. By efficiently combining these signals, the overall cost of signaling can be minimized. In contrast, higher-risk firms are inclined to use earnings management and retain less ownership, as earnings management is perceived as a cost for issuer firms. Therefore, the quality of earnings can be effectively reported when insiders maintain a high level of ownership.

1.6 Contribution to Academic Literature and Practice

This study significantly contributes to the academic literature by investigating the influence of ownership on firm performance, both through direct effects and by considering earnings management as a mediating variable, during the IPO period. This study highlights a positive connection between managerial ownership and firm performance. It is essential to emphasize that in the pre-IPO period, this relationship is mediated by real earnings management practices. In other words, when managers own more shares in their company, real earnings management tends to decrease and firm performance tends to improve. However, in the post-IPO period, the study indicates that managerial ownership does not significantly affect company performance, and real earnings management no longer serves as a mediating variable. This may suggest changes in managerial ownership during the transition of companies from private to public entities. The decline in managerial shareholding after the IPO highlights the risk of losing managerial power and control, which could have an impact on strategic decisions, financial reporting guidelines, and corporate performance.

In practice, policymakers, investors, and stakeholders in the market understand the impact of changes in ownership structure on firm performance and the mediating role of earnings management practices, especially during the IPO event. Such insights are valuable for evaluating the impact of managerial ownership on firm performance during the IPO, as well as pre- and post-IPO.

1.7 Definitions of Specific Terms

Initial public offering (IPO) is the process through which a privately held company issues shares of stock to the public for the first time. Also known as "going public," IPO is a means of raising capital for companies by allowing them to trade their shares on the stock exchange, and transforms a business from a privately owned and operated entity into one that is owned by public stockholders.

Market for Alternative Investment (MAI) is the secondary market that was established by the Stock Exchange of Thailand. It is deemed to be a long-term source of funds for potential and innovative small and medium-sized firms.

Earnings management refers to the practice of using management discretion in financial reporting and structuring transactions to manipulate financial reports or statements. The primary goal of this practice is to mislead stakeholders into thinking that the company's economic performance or contractual outcomes are excellent according to the reported accounting figures, when in fact they are not.

Real earnings management refers to the actions and decisions made by management that distort business practices. These actions can include manipulating the timing of income recognition, which can affect the accounting results and operations of the company. For instance, management may offer more discounts, extend credit periods to increase sales, or cut expenses at their discretion, including research and development expenses, advertising costs, and staff training expenses.

Accrual-based earnings management refers to accruals controlled at the discretion of management, involving the choice of recognizing the value of the transaction and determining the time period. These accruals are considered abnormal since various decisions are made to manage earnings or losses in the current period. The financial reporting period is also a factor in recognizing earnings or losses in accordance with the management's requirements.

Ownership structure refers to the distribution of shares among different types of shareholders with varying degrees of ownership. It encompasses the power to control business operations and the motivation to influence managerial decisions, utilizing resources for the benefit of the company, and increasing the value of securities. This study

specifically focuses on two aspects of shareholding: ownership concentration and managerial ownership.

Ownership concentration refers to the degree to which a few individuals or entities hold a significant of a company's shares. It is a measure of how ownership is distributed among shareholders. To determine ownership concentration, this study calculates the percentage of common shares owned by the largest shareholders at the end of each fiscal year.

Managerial ownership refers to the proportion of shares held by individuals in managerial or executive roles in the company they work for. The concept suggests that the more shares held by management, the more likely executives or directors will make decisions that benefit shareholders. To determine managerial ownership, this study calculates the percentage of common stock held by the board of directors and executives at the end of each fiscal year.

1.8 Delimitations and Limitations of the Study

This research aims to study IPO firms listed on the Market for Alternative Investment (MAI) during 2012–2017, and the sample consists of 83 firms in total (Stock Exchange of Thailand, 2021). This study excludes the offering of trust units of real estate investment trust and an infrastructure investment trust. The companies that are offering common stock in all industry groups will be examined, except for the financial industry, which consists of banking businesses, capital and securities, insurance, and life insurance firms since their financial reporting requirements are very different from industrial firms. These industries are closely associated with local regulators such as the Bank of Thailand (Ibbotson & Ritter, 1995) and the Insurance Department.

To examine the operational performance of IPO firms, this study employs accounting-based measures, including return on assets (ROA) and return on equity (ROE), since it was not possible to determine the market price of stocks in the pre-IPO years. Moreover, it has been evident for some time that stock markets in emerging market economies are highly volatile and inefficient (Lo & MacKinlay, 1988), which makes the use of market-based measures inappropriate.

1.9 Conceptual Framework

This research framework was developed following a comprehensive review of the literature on ownership structure, earnings management, and firm performance. Existing research consistently indicates a decline in firm performance after the IPO. Several factors contribute to this, including the separation of ownership and control after the IPO, which contributes to rising agency costs (Jain & Kini, 1994; Jensen & Meckling, 1976; Kim et al., 2004; Wang, 2005). Also identified as a contributing factor is earnings management during the IPO period.

Previous research has shown that ownership structure can affect financial performance through earnings management in the banking sector (Rizani, Lisandri, Boedhi, & Syam, 2019) and that good corporate governance and corporate social responsibility can also dictate financial performance through earnings management in listed companies (Mahrani & Soewarno, 2018). Consequently, this study's conceptual framework is designed to examine the direct effect of ownership structure (including ownership concentration and managerial ownership) on firm performance measured by return on assets and return on equity. Also investigated here is the indirect effect of earnings management (real earnings management and accrual-based earnings management). This comprehensive analysis aims to understand the relationship between ownership structure, earnings management, and firm performance throughout the periods before, during, and after the IPO. Finally, it clarifies how changes in ownership structure impact earnings management and firm performance, both during and after the initial public offering.

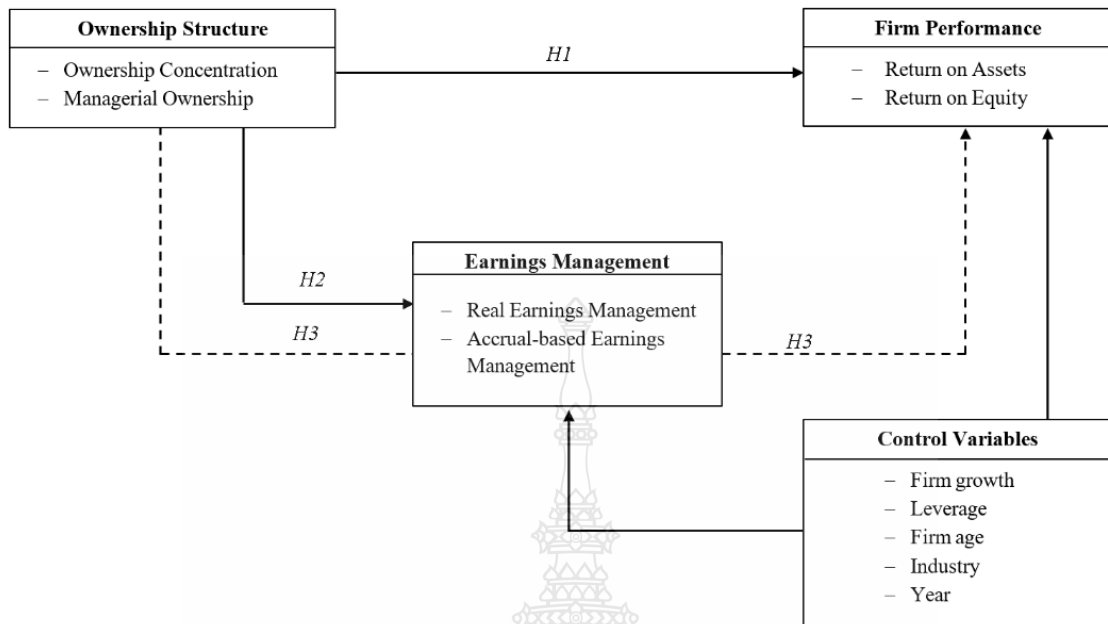
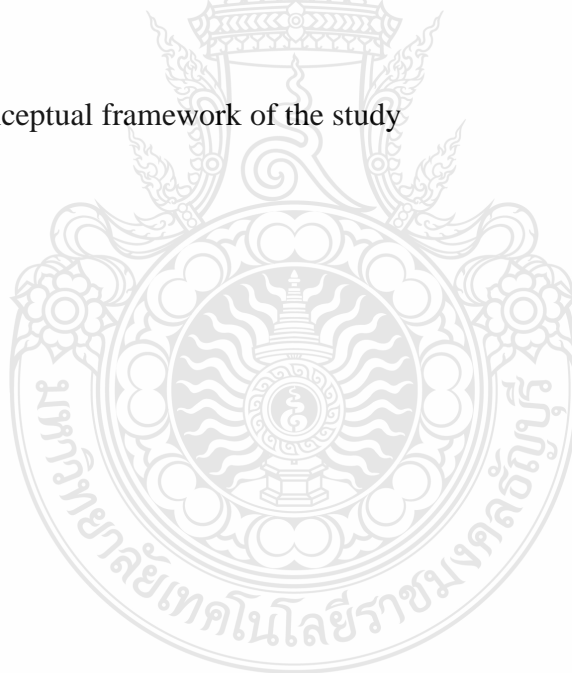


Figure 1.1 The conceptual framework of the study



CHAPTER 2

REVIEW OF THE LITERATURE

2.1 Introduction

This chapter aims to provide a literature review that considers the key theoretical issues related to the research study proposal of ownership structure characteristics, earnings management, and performance of IPO firms. The chapter begins with a discussion of the theoretical background of the study. This discussion focuses on three areas. First, it examines agency theory, which is the underlying theory of corporate governance. Agency theory establishes key assumptions such as the nature of decision-making, separation of ownership and control, which leads to an increase in agency costs. Second, asymmetric information is a state where one party has or will have a greater level of knowledge relative to another party about their own characteristics or actions. Finally, signaling theory is a theory that explains the behavior of two people, namely the sender and receiver. It is a theory used to manage information asymmetry between insiders and potential shareholders. It then defines the theoretical background and positions of key concepts, including ownership structure, earnings management, and IPO firm performance.

The remaining chapter sections draw on the empirical literature on ownership structure characteristics and IPO firm performance. The purpose of this literature review is to establish the likely empirical findings of this study, based on previous studies that have explored similar relationships. These sections of the review first address the role of ownership structure on earnings management and ownership structure on IPO firm performance. It then addresses the role of earnings management as a potential intervening variable in this relationship. Finally, a brief review of the control variables selected for the study is provided. This information supports the establishment of a theoretical framework for the study, which is presented in Chapter 1.

2.2 Theoretical Foundations

2.2.1 Agency Theory

According to Berle and Means (1932), when a firm begins its operation, it is small in size, and owners are also acting as managers of the firm. However, in this case, it would be different as the company grew larger, more capital was needed to become for financing its operations. Therefore, the firm would seek external capital from the market, due to which other investors also provide funds and share ownership with the existing owners. Due to disperse ownership, managers are appointed for controlling the firm operations, and therefore ownership and control are separated. The relationship between dispersed owners and managers was described as the agency relationship.

Jensen and Meckling (1976) define the agency relationship as a contract under which one party (the principal) engages another party (the agent) to perform some service on their behalf. As part of this, the principal will delegate some decision-making authority to the agent. In other words, agency theory is the divergence of interest between shareholders (the principal) and managers (the agent). In particular, the agents may take decisions that serve their interests. Thus, the principal has to offer incentives to the agent and incur monitoring costs to limit the agent's activities. The Agency Theory was developed to understand and restrict possible agency costs, which arises when the shareholder (principal) interests and the manager (agent) are not fully aligned (Brealey et al., 2012).

Initial Public Offerings (IPOs) have been extensively researched. Numerous studies have documented stock price and operating underperformance of IPOs and suggested several reasons like earnings management by issuing firm before IPOs (Rangan, 1998; Teoh, Welch, et al., 1998a), and separation of ownership and control after IPOs leading to an increase in agency costs (Jain & Kini, 1994; Jensen & Meckling, 1976; Kim et al., 2004; Wang, 2005). Separation of ownership and control leads to agency costs. Because of the difference in ownership and control, managers may allocate resources to the activities that presumably benefit them, regardless of the investors' interests. Such managers' decisions conflict with investors' interest and may lead to agency problems defined by Jensen and Meckling.

Agent problems, which refer to the conflicts of interest that can arise between the agents (i.e., the decision-makers or managers) of a company and the principals (i.e., the shareholders or owners), are often explained using the Entrenchment Hypothesis and the Alignment Hypothesis. The Entrenchment Hypothesis explains that when a large shareholder is able to control a majority of voting rights and has full management power, the large shareholder will prioritize their own interests over the interests of minority shareholders when making decisions. This results in management practices that are not transparent (Morck et al., 1988). The Alignment Hypothesis, on the other hand, explains that when a large shareholder has a significant ownership stake and can control a majority of voting rights, it can lead to effective management and decision-making that benefits all shareholders, rather than just the controlling shareholder. This is done without discriminating against minority shareholders who do not have control (Gomes, 2000).

2.2.2 Asymmetric Information

The objective of financial statements is to provide information about corporate financial position, operating results, and changes in its financial position. This information benefits many financial statement users, such as business owners, creditors, investors, management, business partners or customers of the company to make an economic decision. However, external financial statement users may have concerns about the accuracy and reliability of their financial statements because this group is in the greatest condition of uncertainty, whereas internal users (the management) have a direct relationship with the entity or company and know the significant events that occurred. This situation will lead to the emergence of a condition referred to as asymmetric information.

Asymmetric information refers to a situation in which one party possesses or will possess a higher level of knowledge compared to another party regarding their own characteristics or actions (Brown, 2016). Asymmetric information is involved in most of organizational decisions, such as employers' hiring and monitoring employees, purchase of inputs, capital access or market entry, product pricing, including IPO offering price determination. This is due to the fact that insiders know opportunity and possibility of future investment, technological capabilities, managerial skills, strengths and weaknesses of the company while third-party investors cannot access to such information (Carter &

Manaster, 1990; Rock, 1986). Thus, the issuer has to reduce such asymmetric information by issuing a prospectus with various corporate information and appointing a reputable auditor and a reputable underwriter (Beatty & Ritter, 1986).

The condition of information asymmetry characterizes an IPO; wherein potential investors possess substantially inferior knowledge relative to security owners. As current owners of the firm have access to extensive information regarding the firm internal operation, its economic potential, and the industriousness of its management and employees (Leland & Pyle, 1977). Study results of Teoh, Welch, et al. (1998a) noted that the IPO process was extremely sensitive to earnings management because there was an information asymmetry between investors and issuers at the time of the offering. Similar evidence is also found in seasoned equity offerings (Siew Hong Teoh, Ivo Welch, & Tak Jun Wong, 1998b). Rock (1986) pointed out that one of the challenges for issuing IPOs is to reduce information asymmetry arising in the market during the issuance of IPO securities. According to Rock, there are two types of investors: informed investors and uninformed investors. Informed investors are able to obtain intrinsic information of the firm, future market conditions. Thus, they only invest in underpriced IPOs. In contrast, uninformed investors make an investment decision based on limited information. Susanto (2007) explained that informed investors would buy IPOs which can generate future returns while investors who obtain the information only from the IPOs prospectus would buy either overpriced or underpriced stocks. As a result, the latter investors tend to possess highly overpriced stocks which cause them to encounter loss, and eventually leave the market. Dye (1988) and Trueman and Titman (1988) point out that the existence of information asymmetry between managers and shareholders is a necessary condition for the practice of earnings management. Richardson (2000) described the relationship between information asymmetry and earnings management forecasted by Dye (1988) and Trueman and Titman (1988); the results suggest a systematic relationship between the magnitude of information asymmetry and the level of earnings management. Imhoff and Thomas (1994) provide empirical evidence supporting this line of arguments. They conclude that firms who disclose more information are more likely to engage in less EM. Additionally, Lasdi (2013) further evidence was found that the existence of information

asymmetry affects real earnings management during the global financial crisis of Indonesia listed companies.

In conclusion, information asymmetry usually occurs in the IPO event due to the fact that outside investors have limited public information available while insiders or informed investors are able to obtain more internal information. Due to information asymmetry, the manager have the opportunity and incentives to manage earnings during the IPO event to enhance their corporate performance which affects the offering price and attract investors.

2.2.3 Signaling Theory

Signaling theory is used by investors to study the behaviors of issuer firms. This theory can reduce the information asymmetry between insiders and potential shareholders. Since insiders obtain more exclusive information, such as future investment opportunities, managerial skills, technological capabilities, strengths and weaknesses of the company than outside investors, it is expected that an issuer firm will signal the quality of the firm by various methods to attract outside investors to invest in its IPOs (Purayil & Lukose, 2019). Signaling theory has been used in several studies, such as Brau and Johnson (2009), which found evidence that IPO firms self-select prestigious third-party certifiers to signal firm quality, supporting the signaling hypothesis. The four experts are auditors, underwriters, attorneys, and venture capitalists, and it is called a third-party certifier. Fan (2007) found that ownership retention is a potential signal that reflects firm value, and IPO firms will show their quality signals through ownership retention and reported earnings. With an efficient combination, the total cost of signaling can be minimized. This is in line with Leland and Pyle (1977) argue that the equity retained by incumbent shareholders signals the project's perceived quality as they know more about the firm future value. The price that the investors are willing to pay for the share largely depends on their assessment of the issuer firm future value. In addition, Welch (1989) suggested that issuer firm sends a signal to investors to show that it is a good quality firm by underpricing its IPOs. Since the issuer firm cannot disclose its intrinsic value, IPO underpricing is used as a signal to investors that the firm has the opportunity to grow with a higher value in the future. As a result, the stock prices of the firm will be higher. Zheng and Stangeland (2007) examined the relationship between IPO underpricing and the

quality of the company measured by sales revenue and earnings before interest, taxes, depreciation, and amortization (EBITDA). They found that IPO underpricing has a statistically significant and positive correlation with the firm quality. This confirms that pricing IPOs lower than their intrinsic value is a signal of the firm quality. However, certain studies revealed that signaling theory is inconsistent with IPO underpricing. For example, Jegadeesh, Welch, and Weinstein (1991) found that the relationship between signaling theory and IPO underpricing was unclear. The result of their research indicated that the initial return from IPOs was high, but the subsequent return was low. Thus, the initial return cannot be used to predict the firm future performance after the IPO event.

2.3 Definition of Earnings Management

In studying the meaning of income management, it was found that scholars have provided a wide range of meanings of earnings management. Most of them state that earnings management as the manipulation of financial reporting to achieve specific targets. This study presents the most common earnings management definitions:

Schipper (1989) was one of the first to define earnings management. Schipper (1989) defined it as:

“a purposeful intervention in the external financial reporting process, with the intent of obtaining some private (as opposed to, say, merely facilitating the neutral operation of the process).”

The limitations of earnings management as defined by Schipper (1989) are that only the external reporting function is included, not other types of earnings management. Moreover, he does not consider whether manipulation by interfering with the financial reporting process violates Generally Accepted Accounting Principles (GAAP). Under this definition, "real" income management is covered, accomplished by timing investment or financing decisions to alter reported earnings or some subset of it.

Healy and Wahlen (1999) provide a more comprehensive definition of earnings management, by definition:

“Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some

stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers”

From the above definition, the term earnings management has been expanded to be clearer, by Healy and Wahlen (1999) specifies the following form of earnings management:

1) There are a number of ways managers can use their discretion to influence their financial reports. For example, discretion is required to estimate many of the future economic events that are reflected in the financial statements, such as expected lives and salvage values of long-term assets, obligations for pension benefits and other post-employment benefits, deferred taxes, and losses from bad debts and asset impairments. In addition, managers must select an acceptable accounting method for reporting the same economic transactions, such as the straight-line or accelerated depreciation methods or the LIFO, FIFO, or weighted-average inventory valuation methods.

2) Managers use their own discretion in managing working capital. (e.g. inventory levels, the timing of inventory shipments or purchases, and receivable policies) that affect cost allocation and net income. Managers must also choose to make or defer expenditures, such as research and development (R&D), advertising, or maintenance. Finally, they must decide how to structure corporate transactions. For example, equity investments can be structured to avoid or require consolidation. Finally, they must decide how to structure corporate transactions.

Consistent with the earnings management definition of Healy and Wahlen (1999), later research found evidence that cash flow from operations and changes in working capital, are used to achieve increases in earnings (Burgstahler & Dichev, 1997) managers avoid debt covenant violations by manipulated earnings upward (DeFond & Jiambalvo, 1994; Jaggi & Tsui, 2007)

Dechow and Skinner (2000) offer a clear conceptual difference between accounting fraud and earnings management activities (see Figure 2.1).

	Accounting Choices	“Real” Cash Flow Choices
	Within GAAP	
“Conservative” Accounting	Overly aggressive recognition of provisions or reserves	Delaying sales Accelerating R&D or advertising expenditures
	Overvaluation of acquired in-process R&D in purchase acquisitions	
	Overstatement of restructuring charges and asset write-offs	
“Neutral” Earnings	Earnings that result from a neutral operation of the process	
“Aggressive” Accounting	Understatement of the provision for bad debts	Accelerating sales Postponing R&D or advertising expenditures
	Drawing down provisions or reserves in an overly aggressive manner	
	Violates GAAP	
“Fraudulent” Accounting	Recording sales before it is realizable	
	Recording fictitious sales	
	Backdating sales invoices	
	Overstating inventory by recording fictitious inventory	

Figure 2.1 Distinctions between fraud and earnings management (Adopted from Dechow and Skinner (2000))

Dechow and Skinner (2000) distinguish between accounting practices based on generally accepted accounting principles, and fraudulent accounting which violates GAAP and under earnings management within GAAP. The authors have divided earnings management into three groups: conservative accounting, neutral accounting, and aggressive accounting. And divides the method used in earnings management into 2 types: accrual earnings management (accounting choices) and real earnings management (real cash flow choices).

Consistent with Dechow and Skinner (2000) and Katherine Ann Gunny (2005) classifies earnings management into two categories: accruals management and real activities manipulation. Accruals management involves taking advantage of the accounting discretion in the GAAP to obscure or mask true economic performance. Real earnings management occurs when managers undertake actions that change the timing or structuring of operation, investment, and /or financing transactions in an effort to influence the output of the accounting system.

Roychowdhury (2006) focuses on real earnings management, discussing several mechanisms by which managers may manage actual business transactions to avoid earnings reductions and losses. Roychowdhury (2006) defines earnings management as follows:

“Departures from normal operational practices, motivated by managers desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations”

Previously, Roychowdhury (2006) found that managers avoid reporting annual losses while managing earnings by employing structuring business transactions to manipulate earnings upward. Graham, Harvey, and Rajgopal (2005), who surveyed more than 400 executives of U.S. firms, found that approximately 78% of the executives reduced costs for research and development, advertising and maintenance in order to achieve their earnings target. In addition, 55% of the executives avoided initiating new projects despite a positive NPV since they might affect their current earnings report. Some studies also reported that firms attempted to achieve their financial targets by engaging in real earnings management (Cohen & Zarowin, 2008, 2010; Kothari, Mizik, & Roychowdhury, 2012; Zang, 2012).

In addition, Ronen and Yaari (2008) classified earnings management into 3 groups: white, gray and black earnings management. White earnings management represents the application of accounting standards by selecting earnings management to signal future cash flows and benefit the firm. Gray earnings management represents an application of accounting policy or practice to achieve certain objectives determined by the management within the boundaries of compliance with bright-line standards. This can be considered opportunistic, as well as an opportunity to enhance the firms economic

situation. Black earnings management is a conduct of the management that distorts financial reports or reduces the transparency of financial reports.

Table 2.1 Different definitions of earnings management

White earnings management	Gray earnings management	Black earnings management
Earnings management is the application of accounting standards by selecting earnings management to signal future cash flows and benefit the firm.	Earnings management is an application of accounting policy or practice which can be either taking advantage or enhancing the firms economic situation.	Earnings management is a conduct that distorts or reduces the transparency of financial reports.

Note: Adapted from Ronen & Yaari, 2008

According to the definitions above, there are two options the managers can manage earnings: accrual-based earnings management and real activities management. Accrual-based earnings management is an accounting change or a change in accounting estimates within the scope of accounting principles. It is to adjust the figures of financial statements in accordance with the management's desire which does not directly affect the cash flow of the business. Real activities management, such as operating activities, investing activities, or financing activities affect the cash flow of the business. Earnings management can be considered either opportunistic if the management reports earnings opportunistically to maximize their utility or a method to improve earnings informativeness in communicating private information.

2.4 Earnings Management Motivations

The objectives and directions of earnings management are different. They depend on the incentives that the management are encountering. Healy and Wahlen (1999) categorized earnings management motivation tested in accounting literature into three categories: capital market motivation, contracting motivation, and regulatory motivation as follows:

2.4.1 Capital Market Motivation

Accounting information is used by investors and financial analysts to evaluate firm share prices. If the market price of firm shares is higher than its estimated intrinsic value, it is considered that the firm has high profitability. As a result, investors are willing to invest in the firm. Prior studies concentrated on capital market incentives in earnings management, and accrual-based earnings management in particular in periods surrounding capital market transactions. For example, Friedlan (1994) showed that IPO firms make income-increasing accruals in the most current statements included in the prospectus. Teoh, Welch, et al. (1998a) found that abnormal accruals during the year of IPOs are significantly negatively related to post-offer stock returns. Hao (2013) found evidence that IPO firms engage in income-increasing earnings management in the pre-IPO and lockup periods, mainly through current accruals manipulation. Rangan (1998) and Teoh, Welch, et al. (1998b) found positive abnormal accruals (i.e., upwardly managed reported earnings) during the year around the SEO, and SEO issuers who upwardly manage earnings more (greater positive abnormal accruals) have lower post-event stock returns and subsequent earnings. To acquire a firm by exchanging equity shares, Erickson and Wang (1999) reported that acquiring firm has to manage its earnings to be higher prior to the offer of acquisitions. This is to increase the market value of the shares, reduce the number of shares for such exchange, reduce the proportion of the shares held by the target company, and reduce acquisition costs. Francoeur, Amar, and Rakoto (2012) found that firms using stock as a financing medium exhibit significant positive discretionary accruals during the year preceding the M&A and during the year of the acquisition and found that a negative association was found between EM and abnormal stock returns over a three-year period following the acquisition. Guo, Liu, and Song's (2008) findings suggest that acquiring firms tend to split their stocks before acquisition announcements in large M&A deals financed by stock in an attempt to manipulate their equity valuation to lower the cost of acquisitions.

2.4.2 Contracting Motivation

There are two reasons for contract-driven earnings management. First, earnings management may cause misunderstanding and affect resource allocation. Second, financial reporting is used for communicating management information not only to stock

investors, but also to debt investors and to investors' representatives on boards of directors (Healy & Wahlen, 1999). A large literature examined earnings management incentives arising from lending and compensation contract.

Lending Contracts

Terms of lending contracts are one of the incentives that leads to earnings management, or changes in accounting policies. The conditions in lending contracts are specified in financial figures or ratios to ensure the lender, and be a requirement for the borrower to perform in accordance with the conditions specified in the contract. If the borrower can act in accordance with the terms, the lender assumes that the borrower has the ability to repay the principal and interest by the due date. In contrast, if the borrower does not perform in accordance with the lending contract, the lender assumes that that the borrower is unable to repay the principal and interest by the due date. Thus, the lender will reduce the risk by accelerating the repayment of principal and interest, or require higher interest rate higher The financial cost of the borrower is higher which increases the borrower's financial cost. The failure to act in accordance with the lending contract directly affects the borrower which motivates the management to conduct earnings management in order to meet the requirements of the contract and to avoid costs due to such failure. Healy and Palepu (1990) investigated and found that firms close to violating their lending covenants make accounting decisions to increase income or avoid dividends. It has been proven that despite accounting flexibility in management, debt covenants are also useful for debtholders to limit firm dividend decisions.

Management Compensation Contracts

Managers have earnings management incentives to increase their compensation or bonus plans which is often related to the performance of the firm. Scott (2009) defined the bonus plan or executive compensation as:

“An executive compensation plan is an agency contract between the firm and its managers that attempts to align the interests of owners and manager’s by basing the manager’s compensation on one or more measures of the manager’s performance in operating the firm Bonus contracts usually specify manager’s reward on the basis of earnings and share price.”

A number of studies examined the impact of accounting choices on compensation to encourage awareness of this issue. Dye (1988) suggests that employing accounting numbers in compensation contracts is one of most important internal motivations for manipulating earnings. Likewise, Healey (1985) suggests that the manager's accrual improvement was influenced by income-reporting incentives of their bonus contract and that changes in accounting procedures are associated.

2.4.3 Regulatory Motivation

Listed companies are subject to a compliance audit and a number of regulations linked to accounting figures and ratios. These pressure managers to conduct manipulate earnings to demonstrate compliance (Habbash & Alghamdi, 2015). Previous literature shows that earnings management is motivated by regulations, such as industry-specific regulations, antitrust regulations, tax regulations, price regulations, or stock market regulations. These regulations pressure firms to conduct earnings management and report a decrease or increase in earnings to protect their interests. For example, Cahan (1992) investigates the correlations between monopoly-related antitrust investigations and the reporting of firms earnings. The results suggest that managers adjust earnings using discretionary accruals to deal with monopoly-related antitrust investigations. Management tends to decrease the probability of an unfavorable ruling and associated costs by using accounting procedures to report abnormally low income. Haw et al. (2005) examine listed Chinese firms manage earnings to meet security regulations benchmarks the accounting rate of return on equity (ROE) has to be greater than 10 percent for three consecutive years for a firm to qualify for stock rights offers. The result found that the firms that apply for, but fail to receive, regulatory approval manage earnings more significantly than do firms that receive approval and pair-matched control firms. Moreover, the US Congress - the United States passed a law called Sarbanes-Oxley Act or SOX on July 30th, 2002 in order to protect investors from earnings management as a result of the bankruptcy of Enron and WorldCom. The law requires management to evaluate internal controls and ensure the accuracy and reliability of firm data disclosures. Therefore, it is necessary to investigate the earnings management model in the period leading to the passage of SOX and in the period following the passage of SOX. Cohen, Dey, and Lys (2008) examined the effect of the SOX passage on the managerial choice

between AEM and REM. They documented that firms were heavily involved in AEM in the pre-SOX period, but their involvement in AEM declined significantly after the passage of SOX.

2.5 Measures of Earnings Management

2.5.1 Real Earnings Management Activities

Prior studies have shown that firms alter real activities to manage earnings (e.g., Graham et al., 2005; Roychowdhury, 2006). There are two main reasons managers use real earnings management rather than accrual-based earnings management. First, real earnings management (REM) tends to draw less interest in auditing from the auditor or regulators than accrual-based earnings management (AEM). Second, relying on accrual manipulation alone is risky. If the managers have used this strategy, but the earnings are still lower than the manager's desires, they are required to use real earnings management (Cohen & Zarowin, 2010). Roychowdhury (2006) defines REM as departures from normal operating practices, motivated by managers' desire to mislead at least some stakeholders into believing that certain financial reporting goals have been met in the normal course of operations. These departures do not necessarily contribute to firm value, even though they enable managers to meet reporting goals. Real earnings activities are performed by various means, including: offering higher discounts, or extending credit term to increase sales, overproducing products to reduce the cost of sales, reduction of discretionary expenditures, such as research and development expenses, advertising expenses, employee training expenses, etc. (Gunny, 2010; Roychowdhury, 2006).

Sales Manipulation

Sales manipulation is a manager's attempt to temporarily increase sales during the year by offering price discounts or more lenient credit terms. Sales management will reduce the cash flow in the current period and the production cost is much higher than the normal sales level. The Roychowdhury (2006)'s model for estimating normal cash flows from operations is as follows:

$$CFO_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \beta_1(S_t/A_{t-1}) + \beta_2(\Delta S_t/A_{t-1}) + \varepsilon_t$$

Where:

CFO_t = cash flow from operations of year t ;

A_{t-1} = is the total assets at the end of period $t-1$,

S_t = the sales during period t and

ΔS_t = $S_t - S_{t-1}$

Production Cost Manipulation

Managers of manufacturing firms can manage their earnings by increasing their production volumes. When production products increase, the production cost per unit will be reduced since the fixed cost does not change according to the production volume. Production costs are the sum of the cost of goods sold (COGS) and the change in inventory (ΔINV). Roychowdhury (2006)'s model for estimating normal production costs are as follows:

$$PROD_t/A_{t-1} = \alpha_0 + \alpha_1 (1/A_{t-1}) + \beta_1(S_t/A_{t-1}) + \beta_2(\Delta S_t/A_{t-1}) + \beta_3(\Delta S_{t-1}/A_{t-1}) + \varepsilon_t$$

Where:

$PROD_{it}$ = The sum of cost of goods sold and change in inventory of firm i in year t ;

ΔS_{it-1} = Sales of firm i in year $t-1$ less sales of firm i in year $t-2$; and all other variables are as previously defined.

Discretionary Expenses Manipulation

Discretionary expenses are costs associated with business activities that are not directly tied to operational procedures, and therefore can be reduced or removed without halting the business in the short run. Example discretionary expenses such as R&D, advertising, and maintenance. The discretionary expense reduction lowers cash outflows and increases earnings in the current period. However, it is possible that future cash flows may be reduced. Roychowdhury (2006)'s model for estimating normal discretionary expenses is as follows:

$$DISEXP_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \beta(S_{t-1}/A_{t-1}) + \varepsilon_t$$

Where: $DISEXP_t$ is discretionary expenses in period t .

2.5.2 Accruals Earnings Management

Accounting earnings is a figure that reflects firm performance on an accrual basis. According to generally accepted accounting principles, when an economic event occurs, the firm has to recognize and record such events in accordance with generally accepted accounting principles even though the firm has not received or paid any cash. As a result, recognition of items on an accrual basis and cash flow are inconsistent. This leads to difference in accounting earnings and cash flow. The fundamental objective of accruals is to disclose the real output of the company in the financial statements (Nguyen, 2019).

However, accruals can also be used as a mechanism to manipulate reported earnings. Reported earnings can be manipulated when managers delay asset write-offs, make inadequate provision for bad debts or opportunistically select accounting methods (Roychowdhury, 2006). From Healy and Wahlen's (1999) point of view, the management can exercise their discretion in preparing financial statements to present useful information for financial statement users if the selected accounting policy or estimation method leads to a reliable signal of the firm performance. Leuz (2010) discussed that discretion in preparing financial statements has advantages and precautions. Even though discretion in preparing financial statements enables insiders to communicate by presenting information of the firm in order to reflect economic performance, insiders may seek opportunities to act inappropriately. For example, insiders may exercise their discretion to conceal the firm's poor economic performance, conduct earnings management to meet the target, or avoid circumstances that may violate the conditions specified in the contract.

To investigate accrual-based earnings management, it is necessary to distinguish normal accruals from abnormal accruals (McNichols, 2000). Normal accruals or nondiscretionary accruals arise from economic performance that reflects the firm normal operations as a result of strategic decisions, the industrial environment, and general economic factors. Abnormal accruals or discretionary accruals are conducted by the

management by selecting a depreciation method, creating an allowance for doubtful accounts, creating provisions, and estimating useful life and salvage value.

In the literature, total accruals (TA) are calculated in two ways: balance sheet-based approach and cash flow statement-based approach to distinguish normal accruals from abnormal accruals. In the balance sheet-based approach (Healy, 1985; Jones, 1991), the total accruals are formulated as follows:

$$TA_t = \Delta CA_t - \Delta Cash_t - \Delta CL_t - \Delta DCL_t - DEP_t$$

Where:

ΔCA_t = Change in current assets in year t ;

$\Delta Cash_t$ = Change in cash and cash equivalents in year t ;

ΔCL_t = Change in current liabilities in year t ;

ΔDCL_t = Change in debt included in current liabilities in year t ;

DEP_t = Depreciation and amortization expense in year t .

The second method that is used in the calculation of total accruals is the cash flow statement-based approach. According to this approach, total accruals are generally calculated as follows (Dechow, Sloan, & Sweeney, 1995)

$$TA_t = NI - CFO$$

Where:

NI = Net Income

CFO = Cash from operating activities

Hribar and Collins (2002) examined whether the balance sheet-based approach or direct calculation from the cash flow statement-based approach is more successful. The results of the study revealed that, with the same conditions, calculating cash flow statement-based approach gives better results balance sheet-based approach.

Thus, abnormal accruals are employed as a proxy for detecting accrual earnings management (Beneish, 2001; DeAngelo, 1986) Previous research has developed a model to measure non-discretionary accruals as follows:

The Healy Model

Healy (1985) offers an early model to detect earnings management by managers to increase their compensation. He proposed a model to measure non-discretionary accruals. Using the average total accruals for the current year divided by the previous year's total assets.

$$NDA_{i,t} = \sum_t TA_{i,t} / A_{i,t-1}$$

Where:

- $NDA_{i,t}$ = estimated non-discretionary accruals of firm i
- $TA_{i,t}$ = estimated normal accruals of firm i
- $A_{i,t-1}$ = total assets of firm i in year $t-1$

The DeAngelo Model

In a similar approach, DeAngelo (1986) uses the first differences in total accruals as a measure of earnings management, and by assuming that the first differences have an expected value of zero. This model uses last period's total accruals (scaled by lagged total assets). Thus, the DeAngelo Model for nondiscretionary accruals is:

$$NDA_{i,t} = TA_{i,t-1}$$

The DeAngelo Model is considered a special version of the Healy Model (1985) in which the estimation period for non-discretionary accruals is restricted to the previous year's observation (Dechow et al., 1995).

The Healy and DeAngelo Models' common feature is that they both use total accruals from the estimation period to proxy for expected non-discretionary accruals. In case non-discretionary accruals are constant at a period of time, and discretionary accruals are zero in Healy (1985) and DeAngelo (1986)'s models, the value of non-discretionary accruals can be accurately measured. In the event that non-discretionary accruals vary from time to time, the appropriate model depends on the time series process for nondiscretionary accruals. If nondiscretionary accruals follow a white noise process around a constant mean, then the Healy model is appropriate. If nondiscretionary accruals follow a random walk, then the DeAngelo model is appropriate (Dechow et al., 1995).

The Jones Model

Jones (1991) proposed a model relaxing the assumption of Healy (1985) and DeAngelo (1986). This model contains the assumption that the average change in non-discretionary accruals is constant, and changes of all accruals are due to discretionary accruals. The Jones (1991) model controls the impact of firm economic changes on non-discretionary accruals by adding changes to revenues and gross property plant and equipment (Schipper) in the model. The Jones Model for nondiscretionary accruals in the event year is:

$$NDA_t = \alpha_1(1/A_{t-1}) + \alpha_2(\Delta REV_t) + \alpha_3(PPE_t)$$

Where:

ΔREV_t = revenues in year t less revenues in year $t - 1$ scaled by total assets at $t - 1$;

PPE_t = gross property plant and equipment in year t scaled by total assets at $t - 1$;

A_{t-1} = total assets at $t - 1$; and

$\alpha_1, \alpha_2, \alpha_3$ = firm-specific parameters.

Estimates of the firm-specific parameters α_1, α_2 and α_3 are generated using the following model in the estimation period:

$$TA_t = a_1(1/A_{t-1}) + a_2(\Delta REV_t) + a_3(PPE_t) + v_t$$

Where:

a_1, a_2 and a_3 denote the Ordinary Least Squares (McNichols) estimates of α_1, α_2 and α_3 and TA is total accruals scaled by lagged total assets. The results in Jones (1991) indicate that the model is successful at explaining around one quarter of the variation in total accruals (Dechow et al., 1995)

The Industry Model

The Industry Model is proposed by Dechow and Sloan (1991). The Industry Model relaxes the assumption that nondiscretionary accruals are constant over time and assumes that variation in the determinants of nondiscretionary accruals are common across firms in the same industry. The Industry Model for nondiscretionary accruals is:

$$NDA_{i,t} = \beta_1 + \beta_2 \text{median } i(TA_t/A_{t-1})$$

Where:

$\text{median } i(TA_{i,t})$ = the median value of total accruals in the year t scaled by lagged total assets for all nonsample firms in the same industry and year.

The firm-specific parameters β_1 and β_2 are estimated using OLS on the observations in the estimation period.

The ability of the Industry Model to decrease the measuring error in discretionary accruals depends on two factors that can be criticized. First, the Industry Model removes the variance of nondiscretionary accruals, which are more common in companies in the same industry. If change in nondiscretionary accruals largely reflect responses to changes in firm-specific circumstances, then the Industry Model will not extract all nondiscretionary accruals from the discretionary accrual proxy. (Dechow et al., 1995). Second, the Industry Model removes variation in the discretionary accrual relationship between companies in the same industry, which can cause problems. The severity of this problem depends on the extent to which the earnings management stimulus is correlated across firms in the same industry (Dechow et al., 1995).

The Modified Jones Model

The Modified Jones Model is designed to eliminate the conjectured tendency of the Jones Model to measure discretionary accruals with error when discretion is exercised over revenue (Dechow et al., 1995). In the modified model, nondiscretionary accruals are estimated during the event year (i.e., the year in which earnings management is hypothesized) as:

$$NDA_t = \alpha_1(1/A_{t-1}) + \alpha_2(\Delta REV_t - \Delta REC_t) + \alpha_3(PPE_t)$$

Where:

$$\Delta REC_t = \text{net receivables in year } t \text{ less net receivables in year } t - 1 \\ \text{scaled by total assets at } t - 1$$

According to Jones Model, all earnings from sales are considered normal accruals based on the hypothesis that no earnings entries are performed before the accrual conditions in regards to making the entry come into existence completely. However, one of the earnings management techniques is recording the sales revenue before it incurs. This can increase account receivables. Since Dechow et al. (1995) found that calculating discretionary accruals is the weakness of Jones Model (1991), Modified Jones Model was developed and widely accepted.

The Yoon, Miller, and Jiraporn model (2006)

Yoon, Miller, and Jiraporn (2006) employed discretionary accruals, computed by subtracting non-discretionary accruals from total accruals, to serve as a proxy for evaluating the degree of earnings management. The authors employed a regression model to estimate non-discretionary accruals and found total accruals to be a practical and relatively error-free metric. Based on the Yoon model (2006), total accruals are typically influenced by variations in cash sales revenue, cash expenses, as well as certain non-cash expenditures like depreciation and retirement benefits expenses.

$$TA_{it}/REV_{it} = \beta_1(\Delta REV_{it} - \Delta REC_{it}/REV_{it}) + \beta_2(\Delta EXP_{it} - \Delta PAY_{it}/REV_{it}) \\ + \beta_3(\Delta DEP_{it} + \Delta RET_{it}/A_{t-1}) + \varepsilon$$

Where:

REV = net sales revenue

REC = receivables

EXP = sum of the cost of goods sold and selling and general administrative expense excluding non-cash expenses.

PAY = payables

DEP	=	depreciation expenses
RET	=	retirement benefits expenses
At-1	=	total asset in the year $t-1$
Δ	=	change operator

2.6 Real and Accrual Earnings Management around IPOs

An initial public offering (IPO) occurs when a security is sold to the general public for the first time, with the expectation that a liquid market will develop (Ritter, 1998), IPO was one of the most important steps in the development of a company which is a preliminary strategy to change and improve the organization rapidly (Daily et al., 2003). Previous studies have highlighted the benefits of going public, including diversification, the possibility of equity financing beyond the initial entrepreneurs' limited wealth, less costly access to the capital market, increased liquidity of firm shares, some outside monitoring, enhanced company image and publicity, motivating management and employees, and cashing in (Pagano, Panetta, & Zingales, 1998; Roell, 1996; Zingales, 1995).

At the time of initial public offering (IPO), managers have private information about investment opportunities, future cash flows, and their own managerial skills. On the other hand, investors have limited information on this. As a result of information asymmetry, so the regulator has determined that the company initially offering shares to the public shall publish a prospectus to disclose company information, such as its nature of the business, future projects, risk factors, including previous financial statements. The information helps investors estimate the IPO price that they are willing to pay (Roosenboom, van der Goot, & Mertens, 2003). The use of financial statements in the market-price process, together with accounting discretion, can provide incentives and opportunities for the managers to manage earnings during the IPO period to improve earnings which also affects the offering price. This additionally attracts investors to invest in the company (Armstrong, Foster, & Taylor, 2016; Beneish, 2001; Neill, Pourciau, & Schaefer, 1995; Roosenboom et al., 2003).

Friedlan (1994) points out that IPO issuers make income-increasing discretionary accruals in the financial statements released before the offering. This

evidence is consistent with the hypothesis that issuers believe that financial statement information affects IPO offering prices. Previous studies found evidence that firms with unusually high accruals in the IPO year tend to experience poor stock return performance in the three subsequent years (Chaney & Lewis, 1998; Miloud, 2014; Roosenboom et al., 2003; Teoh, Welch, et al., 1998a), and they interpret this as evidence that firms cook the books to obtain a higher offer price. Hao (2013) found that, based on the discretion of the management, the company managed earnings using accruals prior to the offering of shares and during the lockup period to increase the share price and to benefit the existing shareholders. Ertimur, Sletten, Sunder, and Weber (2017) found that the company did not manage its earnings before the IPO, but IPO firms exhibit positive abnormal accruals in the quarter before and the quarter of the lockup expiration in order to increase the share price for the existing shareholders. In contrast, Armstrong et al. (2016) and Ball and Shivakumar (2008) found that IPO firms were unable to systematically manage earnings since they were controlled by their auditor, board of directors, and underwriter.

Despite extensive research on accrual earnings management and IPOs, there has been little research examining whether IPO firms engage in manipulating real activities. Darrough and Rangan (2005) found empirical evidence showing that IPOs reduce R&D expenditures during the IPO year to increase reported earnings. They found that the reduction in R&D was motivated by managerial share selling, as managers believe investors were more focused on current earnings. Consistent with Graham et al. (2005) provide evidence 80% of the executives surveyed admitted to engaging in the manipulation of real activities such as reducing R&D, advertising, and maintenance expenses to meet earnings targets. More than 50% of executives expressed a willingness to postpone the initiation of new projects as long as the impact on economic value was not too large. More recently, Wongsunwai (2013) found evidence that IPO firms manage both real and accrual-based activities during the IPO year, but that the presence of reputable venture capitalists constrains real and accrual earnings management. Alhadab, Clacher, and Keasey (2015) found evidence that UK IPO firms manipulate earnings upward by utilizing real and accrual earnings management during the IPO year. In addition, they found that IPO firms experience a higher probability of IPO failure and lower survival rates in the post-IPO period when greater real earnings management takes

place during the IPO as compared to accrual earnings management. Kalgo et al. (2016) found that Malaysian IPO firms engage in both accrual and real earnings management discretionary behavior during the IPO period.

In the Thai context, studies of IPO firm earnings management are also limited, and most of them use accrual earnings management strategies as a proxy for earnings management. These include Keeratipongpakdee (2017) found that the initial public offering companies manage their earnings through discretionary accruals in the year before its securities were sold, the issuance year, and the year after the company was listed. Piriyaniti and Supattarakul (2006) found that firms manage earnings through discretionary accruals in the IPO year. However, no evidence was found that the company had adjusted higher earnings in the previous year and after the IPO. Accrual discretion is only one aspect of measuring discretionary behavior. Therefore, this study extends the previous literature by adding real activity manipulation as a proxy to measure earnings management.

2.7 Ownership Structure

“Shareholders”, the owner of the company or the owner of investment, are important since they indirectly control the company by appointing the board of directors to represent them in overseeing the operations of the business to protect their interest. Previous research has divided ownership structure into two types based on shareholder equity: dispersed ownership structure and concentrated ownership structure.

1) Dispersed ownership structure is a structure with a large number of shareholders holding a small percentage of shares. Dispersed ownership structure is often managed by professional management (Denis & McConnell, 2003). This shareholding structure, often found in developed countries, such as the United States and England (Denis & McConnell, 2003; Franks, Mayer, & Rossi, 2005; Franks, Mayer, & Wagner, 2006). This structure provides a clear separation between ownership and control. Due to a few voting rights, the shareholders hire executives with the capability to manage the company on their behalf. This results in a conflict of interest between the management who has control over the business and the shareholders who own the business. In case the management exercise their powers to pursue personal gain instead of maximizing benefit

or wealth for the shareholders, this conflict of interest leads to agency problem between the minority shareholders and the management (Strik, 2011).

2) Concentrated ownership structure is a structure with a small number of major shareholders and concentration. With adequate voting rights, the shareholders can control the organization. By holding a position as an executive director or the management, controlling shareholders play an important role in the administration and policy of the company. This structure is commonly found in Asian and European countries, such as Japan, Germany, and Thailand. In a concentrated entity, conflicts of interest often occur between the controlling shareholder and the minority shareholder since the controlling shareholder has power and influence over the management. As a part of the executive management, the controlling shareholder acts or makes a decision by considering the interests of the major shareholders. However, such actions or decisions can negatively affect the overall business value, and the minority shareholders.

2.8 IPO Performance

Jain & Kini (1994) explained the possibility of a decrease in post-IPO operating performance. The first reason is the possibility of an increase in agency costs during a company transitions from private to public ownership. At this process, management ownership is reduced, which leads to agency problems as specified by Jensen and Meckling (1976). The firm performance can be affected by conflicts between the former owners and shareholders since managers are incentivized to increase perquisite consumption. A project that does not deliver the highest value also represents perquisite consumption. The second reason is that earnings management is conducted prior to going public. As a result, the pre-IPO performance is unreasonably high, while the post-IPO performance is underestimated. The third reason is that IPOs are issued during the period with good performance levels, which cannot be sustained in the future.

The extant literature on initial public offerings (IPOs) provides evidence of the subsequent underperformance of issuing firms. Hansen and Crutchley (1990) found that firms experience a significant decline in operating returns and an increase in capital expenditures after their IPOs. They also noted a positive correlation between the size of the decline in operating returns and the size of the IPO, suggesting that managers

strategically time their offerings to raise capital while expecting underperformance. Ritter (1991) studied newly listed US companies and discovered substantial underperformance in stock returns compared to established firms for the first three years post-IPO. Jain and Kini (1994) also observed a significant decrease in performance following IPOs in the US. Khurshed, Paleari, and Vismara (2005) examined IPOs in the UK and found a decline in performance for firms listed on the official list but not for those listed on the Alternative Investment Market. Cai and Wei (1997) focused on IPOs listed on the Tokyo Stock Exchange and revealed a downward drift in post-offering performance, supported by a deterioration in operating performance among Japanese IPO firms. However, in the specific context of Thailand, there is limited research available. Kim et al. (2004) conducted a study on IPOs listed on the Stock Exchange of Thailand (SET) and found evidence indicating a decline in operating performance for firms after their IPO. The next section explains the relationship between ownership structure and IPO performance.

2.9 Ownership Structure and IPO Performance

An IPO is a critical event in a company's life that enables it to raise fresh capital from outside investors and facilitates existing shareholders' sales of their holdings. Additionally, it also provides the public with the opportunity to participate in the success of the company while allowing entrepreneurs to mitigate risks. Generally, going public leads to significant changes in ownership structure, separation of controls, and management. However, it may result in poor management motivation (Mikkelsen et al., 1997). Previous studies on the performance of IPO firms found that the majority of their performance declines after IPOs (Hansen & Crutchley, 1990; Jain & Kini, 1994; Khurshed et al., 2005; Kim et al., 2004; Ritter, 1991). This may be because the IPO has caused a sudden transition in the ownership structure of firms that also affects their operating performance (Bhatia & Singh, 2013). Previous research has examined the relationship between ownership and firm performance in the context of going public decisions of business firms. Such as Morck et al. (1988) indicating that low ownership is associated with low measures of corporate value, as measured by the q-ratio. Jain and Kini (1994) found a significant positive relation between post-IPO operating performance and equity retention by the original entrepreneurs. Mayur et al. (2007) found that firms

with low levels of insiders' ownership in the post-IPO period experienced the greatest decrease in their post-IPO performance. Michel, Oded, and Shaked (2020) found that post-IPO operating performance was positively correlated with institutional holdings.

2.9.1 Ownership Concentration and Firm Performance

Previously, there was an extensive study of the ownership structure and firm performance, with the role of large investors receiving special attention. Investors with a large ownership stake have an incentive to increase firm value, collect information and oversee managers (Claessens, Djankov, Fan, & Lang, 2002). Also, ownership structures play an important role in emerging capital markets such as Thailand. Ownership concentration plays a crucial role in emerging capital markets and can significantly affect firm performance.

Empirical previous studies have found different results when examining a relationship between ownership concentration and firm performance. For example, Berle and Means (1932) found that concentration of ownership allows owners to reduce manager discretion, align managers' interests with those of shareholders, and improve firm performance. As opposed to Demsetz and Lehn (1985), no significant relationship between the ownership concentration and return on equity of companies were found.

In the context of IPOs, there are few and unclear studies. Stoughton and Zechner (1998) pointed out that in IPOs, investors are not homogeneous in the monitoring capabilities. Large shareholders increase the value of IPOs due to their increased ability and motivation to monitor management. Egbers (2020) investigated the correlation between ownership concentration and corporate long-term performance in Chinese IPO settings, a weak negative correlation was found between ownership concentration and long-term firm performance measured in ROA. Connelly, Limpaphayom, and Siraprapasiri (2004) examines the relationship between the ownership concentration and the performance of the initial public offering (IPO) in Thailand during 1989 - 1993. Empirical evidence suggests a positive correlation between the initial ownership concentration and IPO initial returns; however, the relationship between the initial ownership concentration and the long-term IPO performance was not conclusive. Recently, Chalarat (2018) examined the relationship between ownership concentration

and the long-term performance of IPO firms listed on the SET during 2009–2013, finding that ownership structure had no significant impact on firm performance.

Previous studies drew uncertain conclusions about the direction of the relationship between ownership concentration and firm performance. However, this research estimated that the relationship is correlated according to agency theory, which suggested that ownership concentration can reduce agency problems since large shareholders both have an interest in profit maximization and sufficient control over company assets to have their interests followed by management. Thus, the hypothesis is as follows:

Hypothesis 1.1a: Ownership concentration is positively associated with return on assets in the pre-IPO year.

Hypothesis 1.1b: Ownership concentration is positively associated with return on equity in the pre-IPO year.

2.9.2 Managerial Ownership and IPO Performance

According to Jensen and Meckling (1976), agency problem is defined as a conflict of interest between the principal and his agent. The authorized agent with the power to manage the firm acts for his own interests rather than the interests of the company. Most of the representative problems are explained by two main assumptions: entrenchment hypothesis and alignment hypothesis. Entrenchment hypothesis concentrates on the event when the management is the majority shareholder. This can deteriorate operating results since the management seek personal gain over other stakeholders' interests. Shleifer & Vishny (1997) indicated that excessive shares held by the management allow them to control the company, and take advantage of other shareholders. On the other hand, alignment hypothesis concentrates on the event when the management hold a majority of shares and have a more controlling power. This may increase firm performance since the management may consider major shareholding as controlling power which allows them to monitor the operations effectively. Jensen and Meckling (1976) asserted that when managers hold a high stake in the firm, they are likely to avoid consuming perquisites because they must bear the costs of such activities in proportion to their shareholdings.

Many empirical studies found a relation between managerial ownership and firm performance. For example, Morck et al. (1988) found a positive relationship between managerial ownership and Tobin's Q for ownership levels between 0 and 5 percent and above 25 percent, but at intermediate levels, the relationship is negative. McConnell and Servaes (1990) find a similar relationship in their study but identify the inflection point between 40 and 50 percent ownership.

In the context of IPOs, Mayur et al. (2007) found that the performance of publicly listed Indian firms deteriorates significantly post-IPO, and firms with low levels of insiders' ownership in the post-IPO period experienced the greatest decrease in their post-IPO performance. In line with Jain and Kini (1994), a significant decline in operating performance subsequent to the initial public offering (IPO) was found. Furthermore, there is a significant positive linear relationship between post-IPO operating performance and equity retention by the original entrepreneurs. Their evidence supports the alignment hypothesis. Kim et al. (2004) examine Thai firms operating performance after going public. They found the performance was lower as well. Additionally, firms with 'low' and 'high' levels of managerial ownership experience positive relationships between managerial ownership and the change in performance (alignment-of-interest hypothesis), while firms with 'intermediate' levels of managerial ownership exhibit a negative relationship between managerial ownership and the change in performance (entrenchment hypothesis).

However, Mikkelsen et al. (1997) used US firm data and found evidence that officers' and directors' median ownership stakes declined significantly from the year before going public to ten years later. The median operating return on assets also declines from the year before the offering to the end of the first year of public trading. However, neither the level of performance after going public nor the change in performance from before to after going public is systematically related to various ownership measures by officers, directors, and other blockholders.

This research expects the relationship between managerial ownership and operating performance to be correlated according to agency theory. Thus, the hypothesis is as follows:

Hypothesis 1.1c: Managerial ownership is positively associated with return on assets in the pre-IPO year.

Hypothesis 1.1d: Managerial ownership is positively associated with return on equity in the pre-IPO year.

2.9.3 Ownership Retention and IPO Performance

Going public often leads to significant changes in the ownership structure. It also results in a separation of controls, management, and ownership which may affect the firm performance. Previous studies debated the issue regarding the relationship between levels of ownership and the firm performance. Certain studies confirmed a positive correlation between changes in the levels of insiders' ownership and the performance of firms proposed by Jensen and Meckling (1976). Certain studies also demonstrated a negative correlation as proposed by Fama and Jensen (1983). Hence, a consensus lacks the exact relationship between the changes in the insiders' ownership and firm performance.

In the IPO context, the study of the relationship between changes in ownership structure and IPO performance is limited and ambiguous. Mayur et al. (2007) found evidence that firms with low levels of insider ownership in the post-IPO period experienced the greatest decrease in their post-IPO performance. Consistent with Jain and Kini (1994), who found a significant positive relationship between post-IPO operating performance and equity retention by the original entrepreneurs. Additionally, Wang (2005) examine changes in Chinese listed companies' operating performance around their initial public offerings. He found that firms with low and high levels of legal-entity ownership (concentration of non-state ownership) exhibit positive relations between ownership and performance changes. In contrast, firms with intermediate legal entity ownership levels experience negative relationships between ownership and performance changes. However, Mikkelsen et al. (1997) found no relation between changes in the ownership stakes of directors and officers around IPOs and firm performance.

This research anticipated that changes in the ownership structure after the IPO are positively associated with firm performance, in line with a proposed by Jensen & Meckling (1976). Thus, the hypothesis is as follows:

Hypothesis 1.2: The retention of ownership structure is positively associated with firm performance in the IPO year.

Hypothesis 1.2a: The retention of ownership concentration is positively associated with return on assets in the IPO year.

Hypothesis 1.2b: The retention of ownership concentration is positively associated with return on equity in the IPO year.

Hypothesis 1.2c: The retention of managerial ownership is positively associated with return on assets in the IPO year.

Hypothesis 1.2d: The retention of managerial ownership is positively associated with return on equity in the IPO year.

Hypothesis 1.3: The retention of ownership structure is positively associated with firm performance in the post-IPO year.

Hypothesis 1.3a: The retention of ownership concentration is positively associated with return on assets in the post-IPO year.

Hypothesis 1.3b: The retention of ownership concentration is positively associated with return on equity in the post-IPO year.

Hypothesis 1.3c: The retention of managerial ownership is positively associated with return on assets in the post-IPO year.

Hypothesis 1.3d: The retention of managerial ownership is positively associated with return on equity in the post-IPO year.

2.10 Ownership Structure and Earnings Management

Ownership and control cannot be completely separated. Controlling shareholders often have some degree of ownership in the company, while other owners have effective control over the company. Therefore, the shareholder structure (i.e., the identities of firm equity holders and the sizes of their positions) is an important component of corporate governance (Denis & McConnell, 2003).

According to agency theory, separation of ownership and control leads to differences in the pursuit of managerial interests versus owners' interests (Jensen & Meckling, 1976). Even though shareholders (owners) and managers collaboratively work for a firm good performance, conflicts of interest between them may arise (Jensen &

Meckling, 1976) and affect the performance of the company. The conflict of interest occurs when the management only concentrate on their personal interest instead of maximizing the value of the enterprise which is the goal of doing business to benefit all shareholders. Therefore, the design of effective organizational control mechanisms for managers to act in the best interests of the shareholders is a key issue in corporate governance and finance (Allen & Gale, 2001). This also ensures that financial reporting is reliable and complete (Alves, 2012).

The role of corporate governance structure in financial reporting is to comply with the financial accounting system and maintain the reliability of financial statements (Bushman & Smith, 2003). With effective monitoring of management in the financial reporting process, a well-structured corporate governance mechanism is expected to reduce earnings management.

The ownership structure, an internal control mechanism focusing on determining company ownership, refers to the manner in which rights of representation redistribute the capital of the company in one or more individuals or legal entities. The audit power derived from the ownership structure leads to the control over the company (González & García-Meca, 2014). Previous research showed that different shareholder structures reflect different motivations for controlling and monitoring firm management (Morck et al., 1988; Shleifer & Vishny, 1986). For example, ownership concentration affects the level of information asymmetry between the management and investors, and the quality of earnings and managers' accounting choices (Donnelly & Lynch, 2002; Fan & Wong, 2002).

Higher managerial ownership can align the interests of shareholders and management and reduce agency costs (Rashid, 2016). However, it has been argued that higher managerial ownership helps mitigate earnings management (Ebrahim, 2007; Klein, 2002; Warfield, Wild, & Wild, 1995). Certain studies reveal that managerial ownership is positively related to earnings management (Cheng & Warfield, 2005; Guidry, Leone, & Rock, 1999) since managers also try to maximize the value of their stockholding (Yang, Lai, & Leing Tan, 2008).

In addition, institutional ownership, one of the strongest mechanisms of corporate governance, can monitor a company's management since it has a considerable

influence on the company management, and aligns the interests of shareholders (Moradzadefard et al., 2012). Supporting evidence indicate that large institutional shareholders hinder an increase or a decrease in the reported earnings as required by the management. This evidence is consistent with the monitoring and constraining the self-serving behavior of corporate managers (Chung, Firth, & Kim, 2002).

The impact of ownership structure on earnings management has been widely investigated in prior studies, however, the results have been inconclusive. This study aims to contribute to the existing literature by examining the relationship between ownership structure and earnings management during the initial public offering (IPO) process. The study's goal is to provide additional insights into the connection between ownership concentration, managerial ownership, and earnings management, with a specific focus on IPOs.

2.10.1 Ownership Concentration and Earnings Management

Ownership concentration measures the existence of large shareholders in a firm (Thomsen & Pedersen, 2000). Large shareholders have a strong incentive to monitor and influence firm management to protect their essential investments. (Ramsay & Blair, 1993; Shleifer & Vishny, 1986). On the other hand, small shareholders would not be interested in monitoring this because they have to bear all the monitoring costs while obtaining a small number of benefits (Shleifer & Vishny, 1986). Thus, a concentration of ownership may be considered as an effective governance mechanism that mitigates agency costs by increasing monitoring (Demsetz & Lehn, 1985). According to the agency framework developed by Jensen and Meckling (1976), the existence of large shareholders' is expected to lower opportunistic earnings management. Demsetz and Lehn (1985) and Stiglitz (1985) ascribes that the managers of publicly-traded companies may lose their control to the large shareholders or they are constantly monitored by the major shareholders. However, concentrated ownership, which involves controlling shareholder in decision making, could create another type of agency conflict between the controlling owner and the minority shareholders, for example the controlling shareholders may interfere with the company's management and encourage managers to manipulate earnings to maximize their private benefits (Jaggi & Tsui, 2007). There are a large number of studies that examine the relation between concentrated ownership and earnings

management. Some scholars are of the opinion that ownership concentration is negatively correlated with discretionary accruals as a proxy for earnings management (Abdoli, 2011; Alzoubi, 2016; Ghaleb, Kamardin, & Tabash, 2020; Roodposhti & Chashmi, 2010). On the other hand, studies that documented a positive relationship between ownership concentration and accrual earnings management includes the works of (Firth, Fung, & Rui, 2007; Halioui & Jerbi, 2012; Waweru & Riro, 2013; Wongyim, 2018). Besides, more complicated and curvilinear associations between earnings management and ownership concentration have been indicated in some research, such as Ding, Zhang, and Zhang (2007) provided evidence that the link between ownership concentration and the magnitude of earnings management of Chinese firms and ownership concentration can be described by an inverted U-shaped model.

However, the research relating to associations between real earnings management and ownership concentration has been limited. Recently, Ghaleb et al. (2020) found that family ownership concentration is negatively and significantly associated with REM. This evidence supports the alignment hypothesis that family ownership concentration mitigates managerial earnings management by preventing real activities manipulation. Mellado and Saona (2020) confirm that the monitoring role of the majority owner is crucial in mitigating real activities manipulation engagement that reduces the informative content of financial statements. Conversely, Kang and Kim (2012) did not find an association between the magnitude of real earnings management and ownership concentration.

Based on the literature review, it is assumed that there is a relationship between ownership concentration and earnings management according to agency theory. Thus, the hypothesis is as follows:

Hypothesis 2.1a: Ownership concentration is negatively associated with real earnings management in the pre-IPO year.

Hypothesis 2.1b: Ownership concentration is negatively associated with accrual-based earnings management in the pre-IPO year.

2.10.2 Managerial Ownership and Earnings Management

According to agency theory, conflicts of interest are likely to arise between external shareholders and managers, who act as representatives of the shareholders. To reduce such agency costs and align the interests of shareholders and management, higher managerial ownership is believed to be effective (Jensen & Meckling, 1976), which aligns with the alignment effect perspective. However, the entrenchment hypothesis suggests that when shareholders possess complete management power, they may prioritize their personal interests over those of the company, taking advantage of minority shareholders due to information asymmetry (Morck et al., 1988). Consequently, this may result in a deterioration in the quality of the company's financial information.

There is no consensus in previous research on the impact of managerial ownership on earnings management. One group of findings is consistent with the alignment effect, such as Warfield et al. (1995) hypothesized based on agency theory that low managerial ownership provides deeper incentives for managers' to manipulate earnings for their own benefit. According to the same study findings, there was a negative association between discretionary accrual (a proxy for earnings management) and insider ownership in the US, in line with Dempsey, Hunt III, and Schroeder (1993), suggests that large insider's ownership reduces earnings management, most recently Klein (2002), You, Tsai, and Lin (2003), Alves (2012) suggests that insiders' ownership is negatively associated with discretionary accruals. Pramithasari and Yasa (2017) found the management ownership has a significant negative effect on earnings management in companies performing IPOs. It is in line with the hypothesis that management's lack of stock ownership makes the management not flexible in making decisions as desired, causing management to tend to perform earnings management.

Another part of the research is consistent with the entrenchment hypothesis. Al-Fayoumi, Abuzayed, and Alexander (2010) indicate that insiders' ownership is significant and positively affect earnings management in Jordanian industrial firms. Gabrielsen, Gramlich, and Plenborg (2002) found a positive but non-significant relationship between managerial ownership and discretionary accruals in a sample of Danish firms. Besides, Sánchez-Ballesta and García-Meca (2007) found a non-linear relationship between insider ownership and discretionary accruals. Their results support the hypothesis that

insider ownership contributes to the constraining of earnings management when the proportion of insiders' shares is not too high. However, when insiders own a large percentage of the shares, they are entrenched, and the relation between insider ownership and discretionary accruals reverses.

However, these extant studies examine the effect of ownership structure on earnings management by focusing only on accrual earnings management. Real earnings management is associated with a greater cost than accrual earnings management, especially in the long run. A recent Mellado and Saona (2020) examine the Latin American market and found that as insider ownership increases, managers engage more actively in real earnings management.

This research expects the association between managerial ownership and earnings management to be correlated according to agency theory. Thus, the hypothesis is as follows:

Hypothesis 2.1c: Managerial ownership is negatively associated with real earnings management in the pre-IPO year.

Hypothesis 2.1d: Managerial ownership is negatively associated with accrual-based earnings management in the pre-IPO year.

2.10.3 Ownership Retention and Earnings Management

An Initial Public Offering (IPO) is a popular exit strategy for pre-IPO shareholders as it allows them to realize the value of their ownership claim in the firm (Fan, 2007; Helbing, 2019). The initial market value of the issuer firm is largely determined by the firm performance report, making it a crucial document for the IPO process. This can motivate IPO firms to engage in earnings management or window dressing to present more favorable accounting numbers (Purayil & Lukose, 2019).

Due to information asymmetry, insiders have access to privileged company information, such as future investment opportunities, technological capabilities, and management skills, while outside investors do not. Therefore, it is expected that the issuer firm signals its quality to outside investors through various channels, such as the prospectus, financial statements, or public news. This is because outside investors rely on these signals to make investment decisions in the IPO market. Additionally, the retention of equity by incumbent shareholders can signal the perceived quality of the project since

they possess more information about the future value of the firm (Leland & Pyle, 1977). As a result, higher retention by pre-IPO shareholders can positively affect the IPO valuation (Daily et al., 2003).

Several studies showed that companies manage earnings during the IPO which results in lower post-IPO performance. Even though several studies found that IPO firms are involved in earnings management, studies on shareholders' incentives to manage earnings are limited. Purayil and Lukose (2019) found that the incentive to manipulate earnings around IPO is associated with the selling motives of pre-IPO shareholders or initial owners, which is in accordance with Fan (2007) found an inverse relationship between earnings management in IPO firms and the level of ownership retained by pre-IPO shareholders. When insiders retain more shares, it becomes more expensive for issuer firms to engage in earnings management, and thus they tend to report better-quality earnings. Kalgo et al. (2016) also found that retained ownership is negatively associated with real earnings management, supporting the alignment hypothesis. Hull, Walker, and Kwak (2013) observed that IPO firms with reduced research and development expenses were linked to a lower insider ownership proportion, and decreasing research and development investments led to higher IPO valuations during the IPO pricing process. This aligns with Darrough and Rangan (2005), who found that changes in R&D in the offering year had a negative correlation with managerial share sales. Furthermore, levels of discretionary current accruals were positively correlated with managerial selling.

Based on the literature review, it appears that the level of ownership held by initial owners or pre-IPO shareholders is correlated with earnings management in IPO firms. Therefore, the following hypotheses are proposed:

Hypothesis 2.2: The retention of ownership structure is negatively associated with earnings management in the IPO year.

Hypothesis 2.2a: The retention of ownership concentration is negatively associated with real earnings management in the IPO year.

Hypothesis 2.2b: The retention of ownership concentration is negatively associated with accrual-based earnings management in the IPO year.

Hypothesis 2.2c: The retention of managerial ownership is negatively associated with real earnings management in the IPO year.

Hypothesis 2.2d: The retention of managerial ownership is negatively associated with accrual-based earnings management in the IPO year.

Hypothesis 2.3: The retention of ownership structure is negatively associated with earnings management in the post-IPO year.

Hypothesis 2.3a: The retention of ownership concentration is negatively associated with real earnings management in the post-IPO year.

Hypothesis 2.3b: The retention of ownership concentration is negatively associated with accrual-based earnings management in the post-IPO year.

Hypothesis 2.3c: The retention of managerial ownership is negatively associated with real earnings management in the post-IPO year.

Hypothesis 2.3d: The retention of managerial ownership is negatively associated with accrual-based earnings management in the post-IPO year.

2.11 Earnings Management and IPO Performance

After the initial public offering (IPO), companies have a long-term downturn in performance, and shareholders with corporate information will gain benefit from transferring their ownership to new investor (with little information) at an appropriate time (opportune time) (Derrien, 2005; Field & Lowry, 2009; Ritter, 1991). Previous studies have found evidence that managers manage earnings before IPOs to report higher earnings, which will positively affect offering prices. In an influential study, Teoh, Welch, et al. (1998a) found that companies with discretionary accruals unusually increased in the IPO year, which resulted in a drop in operating results after the IPO. Besides, several researchers, including DuCharme, Malatesta, and Sefcik (2001), examined the relationship between the accrual and the IPO firm performance. The results indicate that abnormal accruals during the offer year are significantly negatively related to subsequent firm stock returns. Roosenboom et al. (2003) found a negative relation between the size of the DCA in the first year as a public company and long-run stock price performance over the next three years. In contrast, Ball and Shivakumar (2008) report no evidence of earnings management around IPOs in both the U.S. and the U.K. However, evidence was found that the IPO company reported its earnings more carefully by improving the quality of its financial statements before the IPO to ensure the quality of the financial statements

in compliance with the regulations of listed companies and market, such as reputation effects, cost of capital effects, and monitoring by internal and external auditors, boards, analysts, rating agencies, the press, litigators and other parties.

Moreover, prior literature also shows that real earnings management has severe negative consequences for subsequent operating performance and stock returns. The consequences are greater than the consequences of accrual earnings management (Cohen & Zarowin, 2010). There is a growing body of research that shows that firms engage extensively in real earnings management to improve reported earnings (Cohen & Zarowin, 2008; Gunny, 2010; Roychowdhury, 2006; Zang, 2012). Although there is a lot of research examining accrual earnings management and IPOs, little research has examined whether IPO firms engage in manipulating real activities. For example, Darrough and Rangan (2005) show that IPO firms reduce R&D expenses during the IPO year to increase reported earnings. Cheng, Wang, and Wei (2015) found that significant negative correlation relationship exists between real earnings management and the company's performance. Alhadab et al. (2015), Cheng et al. (2015), and Wongsunwai (2013) found evidence that IPO firms manipulate earnings upward utilizing real and accrual earnings management during the IPO year. Alhadab et al. (2015) also found that IPO firms with high levels of real and/or accrual earnings management during the IPO year have a higher probability of IPO failure and lower survival rates in subsequent periods.

For newly listed companies in the Stock Exchange of Thailand, Keeratipongpakdee (2017) found that discretionary current accruals affected the long-term performance of the company, i.e., the companies listed on the MAI stock market had worse performance while the performance of the companies listed on the Stock Exchange of Thailand (SET) did not change much. The result was in accordance with Piriyaniti and Supattarakul (2006), who found that companies with high discretionary current accruals (DCA) in the year of the IPO would have lower performance after IPO than those with low DCA in the IPO year. However, there has not been an empirical study on the impact of real earnings management on the performance of IPOs in Thailand. Therefore, this study aims to fill this gap in the literature by examining the impact of both real and accrual-based earnings management on IPO firm performance over three time windows:

the pre-IPO year, the IPO year, and the post-IPO year. The research hypothesis are as follows:

2.12 Ownership Structure, Earnings Management and firm Performance

An IPO is an important event for firms to raise new funds from outside investors and allows existing shareholders to sell their shares. In addition, IPOs provide both an opportunity and an incentive for issuers to inflate their income numbers for higher IPO valuation (Armstrong et al., 2016; Beneish, 2001; Purayil & Lukose, 2019). Extant literature documents show issuers manage earnings during the IPO event to attract potential investors. (Cheng et al., 2015; Fan, 2007; Teoh, Welch, et al., 1998a). Due to information asymmetry between the issuer and potential investors, it is an opportunity for issuers to manage earnings. Previous studies have also found that issuers with unusually high accruals in the IPO year experience poor post-IPO returns. (Abdul Rahman & Wan Abdullah, 2005; DuCharme et al., 2001; Roosenboom et al., 2003; Teoh, Wong, & Rao, 1998).

In emerging capital markets, such as Thailand, ownership concentration plays an important role and may positively affect the performance of the organization by reducing the conflict between principal and agent (David, Hitt, & Tan, 2003; Shleifer & Vishny, 1997; Stoughton & Zechner, 1998; Wang, 2005) or negative affect the performance of the organization by increasing conflicts between major and minor shareholders. (Egbers, 2020; Sonza & de Oliveira Kloeckner, 2014). Building on the agency framework developed by Jensen and Meckling (1976), the existence of large shareholders' is expected to lower opportunistic earnings management. This is because the manager may lose control to the major shareholders or be continuously monitored by the major shareholders (Demsetz & Lehn, 1985; Stiglitz, 1985). However, large shareholders' may interfere with the company's management and encourage managers to manipulate earnings to maximize their private benefits (Jaggi & Tsui, 2007).

In addition, conflicts of interest between shareholders, especially external shareholders and executives acting as representatives of shareholders are expected to occur according to agency theory. Higher managerial ownership can optimize shareholder and management interests and lower agency costs (Jensen & Meckling, 1976). This is in

line with the alignment effect perspective. The alternative view is the entrenchment hypothesis. Morck et al. (1988) stated that if the shareholders have complete management power, they may manage the business based on their personal interests without maximizing the interest for the company. Due to information asymmetry, they tend to take advantage of minority shareholders. These can adversely affect the quality of the company's financial information.

This is an empirical study to determine whether pre-IPO ownership concentration and managerial ownership are correlated with firm performance through earnings management. Previous research found that institutional ownership and managerial ownership influence financial performance through the mediation of earnings management (Rizani et al., 2019). Mahrani and Soewarno (2018) found evidence that good corporate governance mechanisms and corporate social responsibility influence financial performance through the mediation of earnings management among listed companies. However, no evidence of this relationship was found during the IPO period. Thus, this research suggests that earnings management is a mediator variable in the relationship between ownership structure and operating performance in the pre-IPO period. The hypothesis is as follows:

Hypothesis 3.1: Earnings management mediates the association between ownership structure and firm performance in the pre-IPO year.

Hypothesis 3.1a: Real earnings management mediates the association between ownership concentration and return on assets in the pre-IPO year.

Hypothesis 3.1b: Real earnings management mediates the association between managerial ownership and return on assets in the pre-IPO year.

Hypothesis 3.1c: Real earnings management mediates the association between ownership concentration and return on equity in the pre-IPO year.

Hypothesis 3.1d: Real earnings management mediates the association between managerial ownership and return on equity in the pre-IPO year.

Hypothesis 3.1e: Accrual-based earnings management mediates the association between ownership concentration and return on assets in the pre-IPO year.

Hypothesis 3.1f: Accrual-based earnings management mediates the association between managerial ownership and return on assets in the pre-IPO year.

Hypothesis 3.1g: Accrual-based earnings management mediates the association between ownership concentration and return on equity in the pre-IPO year.

Hypothesis 3.1h: Accrual-based earnings management mediates the association between managerial ownership and return on equity in the pre-IPO year.

Changes in the shareholder structure after going public resulting in separation of controls, management and ownership. It may also result in poor management motivation (Mikkelsen et al., 1997). Previous studies on the performance of IPO companies found that the majority of their performance declines during post-IPOs (Hansen & Crutchley, 1990; Jain & Kini, 1994; Khurshed et al., 2005; Kim et al., 2004; Ritter, 1991). Moreover, Jain and Kini (1994) confirmed that the IPO results in dilution of stock ownership and increases agency costs. The decline in management ownership occurs during the process of transition from being a private company to a public company according to Jensen and Meckling (1976). Jain and Kini (1994) also found that IPO firms where entrepreneurs retain higher ownership generally demonstrate superior performance relative to other issuing firms both before and after adjustment for industry effects. Recently, Purayil and Lukose (2019) found that the degree of earnings management by issuer firms is positively associated with the ownership dilution at the time of the IPO as well as around lockup expiration.

Based on the above review, change in stake of the existing shareholders (pre-IPO shareholder) is related to earnings management and post-IPO performance. However, no empirical study shows whether earnings management is a mediator variable in the relationship between ownership structure (concentrated and managerial ownership) and operating performance in the IPO year and later. Thus, the hypothesis is as follows:

Hypothesis 3.2: Earnings management mediates the association between the retention of ownership and firm performance in the IPO year.

Hypothesis 3.2a: Real earnings management mediates the association between the retention of ownership concentration and return on assets in the IPO year.

Hypothesis 3.2b: Real earnings management mediates the association between the retention of managerial ownership and return on assets in the IPO year.

Hypothesis 3.2c: Real earnings management mediates the association between the retention of ownership concentration and return on equity in the IPO year.

Hypothesis 3.2d: Real earnings management mediates the association between the retention of managerial ownership and return on equity in the IPO year.

Hypothesis 3.2e: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on assets in the IPO year.

Hypothesis 3.2f: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on assets in the IPO year.

Hypothesis 3.2g: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on equity in the IPO year.

Hypothesis 3.2h: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on equity in the IPO year.

Hypothesis 3.3: Earnings management mediates the association between the retention of ownership and firm performance in the pre-IPO year.

Hypothesis 3.3a: Real earnings management mediates the association between the retention of ownership concentration and return on assets in the post-IPO year.

Hypothesis 3.3b: Real earnings management mediates the association between the retention of managerial ownership and return on assets in the post-IPO year.

Hypothesis 3.3c: Real earnings management mediates the association between the retention of ownership concentration and return on equity in the post-IPO year.

Hypothesis 3.3d: Real earnings management mediates the association between the retention of managerial ownership and return on equity in the post-IPO year.

Hypothesis 3.3e: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on assets in the post-IPO year.

Hypothesis 3.3f: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on assets in the post-IPO year.

Hypothesis 3.3g: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on equity in the post-IPO year.

Hypothesis 3.3h: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on equity in the post-IPO year.

Based on a literature review on ownership structure, earnings management, and IPO firm performance, the findings can be summarized, as shown in Table 2.2-2.4

Table 2.2 Review of ownership structure and IPO firm performance

Authors	Year	Independent Variables	Dependent Variables	Sign
Jain and Kini	1994	Managerial ownership	Operating return on assets	(+)***
			Operating cash flows	(+)***
			Sales	(+)***
			Assets Turnover	
			Capital Expenditures	
Mikkelson et al.	1997	Managerial ownership	Operating return on assets	
Kim et al.	2004	Managerial ownership	Change in operating return on assets	(+)*** (-)***
Balatbat, Taylor and Walter	2004	Insider Ownership	Operating return on assets	(+)**
Wang	2005	Ownership Concentration	Return on Assets	(+)***
Mayur et al.	2007	Insider Ownership	Operating return on assets	
			Operating Profit	(-)***
			Sales/Total assets	
			Return on Net Worth	
			Capital Employed	

Table 2.2 Review of ownership structure and IPO firm performance (Cont.)

Authors	Year	Independent Variables	Dependent Variables	Sign
Boubaker and Mezhoud	2011	Managerial ownership	Asset Turnover	(+)**
			Net Income/Total Assets	(-)**
			Return on Assets	(-)**
			Return on equity	(+)*
			Total Debt/Total Assets	(-)*
Bhatia and Singh	2013	Promoters' Ownership	Return on Assets	
			Return on Equity	
			Asset Turnover	
			Cash flow from operating activities	
Junior, de Morais, De Luca, and de Vasconcelos	2020	Ownership Concentration	Return on equity	
			Return on Assets	

Note: *, **, *** Indicate .10, .05, and .01 significance levels, respectively.

Table 2.3 Review of ownership structure and earnings management.

Authors	Year	Independent Variables	Dependent Variables	Sign
Darrough and Rangan	2005	Managerial selling	R&D expenditures	(-)***
			Discretionary current accruals	(+)**
Roodposhti and Chashmi	2010	Ownership concentration	Discretionary accruals	(-)***
Abdoli	2011	Ownership concentration	Discretionary accruals	(-)**
Alzoubi	2016	Managerial ownership	Discretionary accruals	(-)***
Purayil and Lukose	2019	Ownership dilution	Real earning management	(+)***
			Discretionary current accruals	(+)**
Ghaleb et al.	2020	Family ownership concentration	Real earnings management	(-)***
Mellado and Saona	2020	Ownership concentration	Real earnings management	(-)***
			Insider ownership	(+)**
			Institutional ownership	(+)**

Note: *, **, *** Indicate .10, .05, and .01 significance levels, respectively.

Table 2.4 Review of earnings management and post-IPO performance.

Authors	Year	Independent Variables	Dependent Variables	Sign
Teoh, Welch, et al.	1998	Discretionary accruals	Stock return	(-) ^{***}
DuCharme et al.	2001	Discretionary accruals	Initial firm value	(+) ^{***}
			Return on equity	
			Stock return (buy-and-hold abnormal return)	(-) ^{***}
Roosenboom et al.	2003	Discretionary accruals	Long-run returns (buy-and-hold abnormal return)	(-) ^{**}
Fan	2007	Discretionary accruals	Change in return on assets	(-) ^{***}
Alhadab et al.	2015	Abnormal cash flow from operations	Failure (Delisted for negative reasons within 5 years after the IPO date)	(+) ^{**}
		Abnormal discretionary expenditure		
		Aggregate real earning management		(+) ^{***}
		Discretionary accruals		(+) ^{**}
Keeratipongpakdee	2017	Discretionary accruals	Market-adjust Return on Assets	(+) ^{***}
			Market-adjust Return on equity	(+) ^{***}
			Cash Flow from Operating Activities (CFO/TA)	(+) ^{***}
Mangala and Dhanda	2019	Discretionary accruals	Return on Assets	(-) ^{**}
			Return on equity	(-) ^{**}

Note: *, **, *** Indicate .10, .05, and .01 significance levels, respectively.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The objective of this chapter is to provide a comprehensive overview of the research methodology employed to gather and analyze the data for this study. The inclusion of this information is crucial for readers to grasp how the results were obtained, and it also facilitates other researchers in replicating or expanding upon the study if desired. By presenting the specific methods and techniques utilized, we strive to foster transparency and enable fellow researchers to validate the findings or apply the model to different markets.

The research methodology adopted for this study was designed to examine the relationships elucidated in the conceptual framework (Figure 3.1). The principal objective was to assess the influence of ownership structure characteristics, namely ownership concentration and managerial ownership, on the performance of IPO firms. Additionally, the study considered earnings management, encompassing real earnings management and accrual-based earnings management, as a mediating variable. To account for other potential influences on the outcomes, the study also incorporated five control variables, including firm growth, leverage, firm length of business operation, year and, industry.

To execute the study, the first step involved defining the population and subsequently selecting a representative sample from it. Data was sourced from various reputable outlets, and the variables were specified based on the research questions and conceptual framework. Subsequently, statistical techniques were employed to analyze the data and test the relationships between the predictor and outcome variables, as well as to examine the mediating role of earnings management.

In conclusion, this chapter elucidated the research methodology employed to gather and analyze the data for this study. By delineating the steps taken to conduct the research, we aim to provide readers with a clear understanding of the process and enable replication or extension of the study. Furthermore, by offering transparency in the methods and techniques employed, we facilitate the verification of results and the application of the model to different markets.

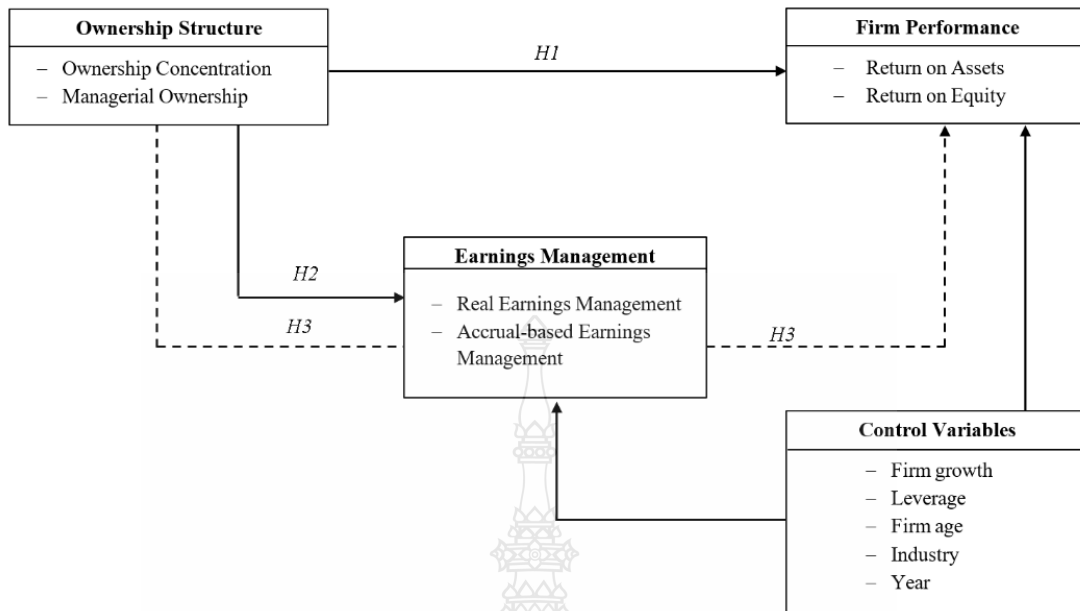


Figure 3.1 Research conceptual framework

3.2 Research Design and Methods

This study employed a quantitative research design and utilized secondary data sources for data collection. The data was analyzed using statistical software to examine the relationships between the predictor and outcome variables, as well as the mediating role of earnings management. The research methodology is as follows:

3.2.1 Population and Sample

The population in this study consists of the listed IPO firms on the Market for Alternative Investment (MAI) between January 2012 and December 2017, totaling 83 firms (SET, 2021). I selected this time frame to observe trends in earnings management and firm performance during one year before and three year after the IPO. This analysis aimed to ensure the empirical evidence is up-to-date and minimize the impact of the accounting standards changes. Therefore, I collected the data from 2010 to 2020. IPOs made from 2012 through 2017 were identified using data from the Securities and Exchange Commission of Thailand (SEC) website.

This study excludes trust units in real estate investment and investment units of the infrastructure fund. Only the companies offering ordinary shares in all industry groups, except for the financial industry, which consists of banking business, capital and

securities, insurance, and life insurance firms since the financial reporting requirements for firms in these industries are different from industrial firms. These industries are highly associated with local regulators, such as the Bank of Thailand (Ibbotson & Ritter, 1995) and the Insurance Department. IPO firms that provide incomplete financial data in prospectuses, firms that were delisted within 2 years from the IPO, and firms under business rehabilitation are also excluded in this study.

According to the aforementioned selection criteria, there are 72 companies to be studied in this research, details are shown below.

Table 3.1 Sample selection

	Observations
	Total
Total IPO firms on the Market for Alternative Investment during 2012-2017	83
Less: Firms in financial industries	(4)
Incomplete information	(2)
Outliers	(5)
Final Sample	72

Table 3.2 Sample characteristics

Panel A: Industry distribution				
Industry	Freq.	%		
Agro & Food Industry (AGRO)	4	5.56		
Consumer Products (CONSUMP)	4	5.56		
Industrial (INDUS)	16	22.22		
Property & Construction (PROPCON)	10	13.89		
Resources (RESOURC)	9	12.50		
Services (SERVICE)	21	29.17		
Technology (TECH)	8	11.11		
Total	72	100.00		
Panel B: Year distribution				
Fiscal Year-End	Freq.	%	Cum Freq.	Cum%
2012	8	11.11	8	11.11
2013	13	18.06	21	29.17
2014	17	23.61	38	52.78
2015	10	13.89	48	66.67
2016	12	16.67	60	83.33
2017	12	16.67	72	100.00
Total	72	100		

3.2.2 Data Sources and Data Collection

The data analyzed include financial information, list of shareholders, and list of lists of directors and executives were collected from secondary sources. The pre-IPO data were collected from the company's prospectus disclosed on the website of the Securities and Exchange Commission of Thailand. The post-IPO data were collected from the financial statements and the Annual Registration Statements (Form 56-1) disclosed on the website of the Securities and Exchange Commission of Thailand and SETSMART online database were collected.

3.2.3 Event Periods

The data were collected 2 years before the IPO, and 3 years after the IPO. Where fiscal year 0 is the year of the IPO, fiscal year -1 refer to the pre-IPO period, and fiscal year +1, +2, +3 refer to the post-IPO period. The analysis period is as shown in Figure 3.2

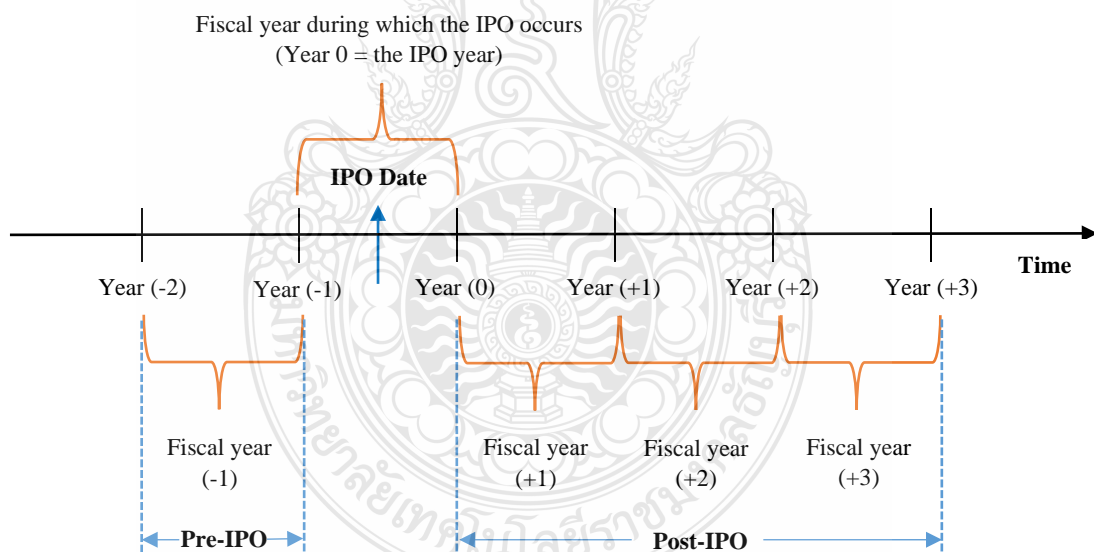


Figure 3.2 Time periods analyzed

3.3 Measurement of Variables

3.3.1 Dependent Variables

In order to assess the performance of IPO firms, the study employed accounting-based measures. These measures were found to be more effective than market-based measures, especially in emerging stock markets where inefficiencies are present and stock prices may not fully reflect all available information (Lo & MacKinlay, 1988). The study utilized return on assets (ROA) and return on equity (ROE) as the performance metrics, which are commonly used indicators for evaluating the performance of IPO firms.

Return on Assets (ROA)

In the IPO literature, the return on assets (ROA) ratio is widely employed as a primary measure to evaluate the operational performance of IPOs (e.g., Jain & Kini, 1994; Kim et al., 2004; Wang, 2005; Bhatia and Singh, 2013; Cheng et al., 2015). The ROA ratio assesses the efficiency of a firm in utilizing its assets to generate income for all stakeholders. It provides valuable insights to managers, investors, and analysts regarding the effectiveness of a company's asset management in generating earnings. A higher ROA is generally considered more favorable for investors. The calculation of ROA involves dividing a company's before-tax and interest operating income by its total assets.

$$\text{ROA} = (\text{Before-tax-and-interest operating income} / \text{Total Assets})$$

Return on Equity (ROE)

Return on equity (ROE) serves as a crucial profitability ratio that assesses a company's ability to generate profits from the equity invested by its shareholders. Numerous prior studies have employed ROE as a key measure to evaluate the performance of IPOs (e.g. Khurshed et al., 2005; Boubaker and Mezhoud, 2011; Bhatia and Singh, 2013; Junior et al., 2020). ROE provides valuable insights to investors regarding how efficiently a company, particularly its management team, is utilizing the funds contributed by shareholders. By calculating ROE, one can gauge the effectiveness of the company's efforts in generating income from the shareholders' invested capital. The computation of ROE involves dividing a company's after-tax net income by its paid-up equity capital. This ratio is highly significant in assessing the financial performance and attractiveness of an IPO firm from an investor's perspective.

$$\text{ROE} = (\text{After-tax net income} / \text{Shareholders' Equity})$$

Table 3.3 List of dependent variables, symbol, measurement, and sources.

Variables	Acronym	Measurement	Sources
Return on assets	ROA	Before-tax-and-interest operating income divided by total assets	Jain and Kini (1994) Kim et al. (2004) Wang (2005) Bhatia and Singh (2013) Cheng et al. (2015)
Return on equity	ROE	After-tax net income divided shareholders' Equity	Khurshed et al. (2005) Boubaker and Mezhoud (2011) Bhatia and Singh (2013) Mangala and Dhanda (2019) Junior et al. (2020)

3.3.2 Independent Variables

In this study, the ownership structure serves as the independent variable, which is further divided into two sub-variables: ownership concentration (CONC) and managerial ownership (MAGE). The measurement of these variables is as follows:

Ownership concentration (CONC): This variable is used to measure the percentage of a company's outstanding shares that are held by the largest shareholders. It is calculated by dividing the number of shares held by the largest shareholders by the total number of outstanding shares.

Managerial ownership (MAGE): This variable is used to measure the percentage of a company's outstanding shares that are held by directors and executives. It is calculated by dividing the number of shares held by the board of directors and executive directors by the total number of outstanding shares.

Table 3.4 List of independent variables, symbol, measurement, and sources.

Variables	Acronym	Measurement	Expected results	Sources
Ownership concentration	CONC	The proportion of common stocks held by the largest shareholder	+/-	Wang (2005) Abdoli (2011) Mellado and Saona (2020) Burdeos (2021)
Managerial ownership	MAGE	The proportion of common stocks held by the board of directors and executives	+/-	Kim et al. (2004) Balatbat et al. (2004) Khurshed et al. (2005) Yang et al (2008) Pramithasari and Yasa (2017)

3.3.3 Mediator Variable

In this study, earnings management acts as the mediator variable, and it is assessed through two measures: real earnings management and accrual-based earnings management.

Real Earnings Management

Following prior research, I estimate real earnings management proxies based on models of real earnings management developed by Dechow et al. (1998) and applied by Roychowdhury (2006), Cohen and Zarowin (2010), and Zang (2012).

This study examines two real earnings management activities; abnormal level of cash flows from operations that result from sales-based manipulation and abnormal level of discretionary expenses that result from reduction of discretionary 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 (Wongsunwai, 2013). Additionally, a significant portion of the firms incorporated into our sample are operating in the service industry.

Sale manipulation is an attempt by managers to temporarily increase sales during the year by offering price discounts or more lenient credit terms. Sales manipulation leads to lower levels of cash flows from operations (Roychowdhury, 2006).

Discretionary expenses meanwhile represent the sum of R&D expenses, selling, and SG&A expenses. Reducing discretionary expenses in the current period will boost

reported earnings and cash flows from operations in the current period. As with estimating measures for accrual earnings management, all variables are scaled with average total assets. I first estimate the normal level of cash flows from operations using the following cross-sectional regression for each industry and year for all non-IPO firms. Unfortunately, MAI is a small capital market so it is not appropriate to estimate the model on an industry basis. I was thus forced to aggregate over all industries, consistent with Roosenboom et al. (2003).

Cash flow from operations (CFO) is expressed 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} = Cash flow from operation of firm *i* in period *t*;
- A_{it-1} = Total assets of firm *i* in year *t-1*;
- S_{it} = Sales of firm *i* in year *t*;
- ΔS_{it} = Sales of firm *i* in year *t* less sales of firm *i* in year *t-1*;
- ε_{it} = A residual term that captures the level of abnormal cash flow of firm *i* in year *t*.

The abnormal level of *CFO* for IPO firms is calculated as actual *CFO* minus the normal level of *CFO* estimated using the coefficients from Equation (1).

Discretionary expenses are expressed as a function of lagged sales (Roychowdhury, 2006). The model used to estimate the normal level of discretionary expenditures is:

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

Where,

- $DISEXP_{it}$ = The sum of Research and Development (R&D) expenses and Selling, General & Administrative (SG&A) expenses of firm *i* in year *t*; and all other variables are as previously defined.

The abnormal level of discretionary expenses for IPO firms is calculated as actual discretionary expenses minus the normal level of discretionary expenses estimated using the coefficients from Equation (2).

In order to measure the total effect of real earnings management, I combine the abnormal level of cash flows from operations and the abnormal level of discretionary expenses to compute an aggregated measure of real earnings management following Alhadab et al. (2015) and Wongsunwai (2013). As both the abnormal cash flows from operations (sales manipulation) and abnormal discretionary expenses represent deviation from normal levels, the sign of these two activates is expected to be negative when the manipulation occurs. So, abnormal cash flow from operations and abnormal discretionary expenses are multiplied by -1, and then calculated as one aggregated measure. A higher amount of this aggregate measure implies that IPO firms are more likely to be manipulating sales and cutting discretionary expenses to increase reported earnings. The model used to estimate the real earnings management (REM) is:

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

Accrual-Based Earnings Management (AEM)

In addition to real earnings management, I also used traditional measures of earnings management. The accrual-based measures have been employed by numerous studies (Ahmad-Zaluki, 2008; Cheng et al., 2015; DuCharme et al., 2001; Fan, 2007; Roosenboom et al., 2003; Teoh, Wong, et al., 1998a). A common feature of those models is to estimate discretionary accruals, which are used as a proxy for management discretion over financial reporting, or earnings management.

Discretionary accruals are calculated as the difference between total accruals and the estimated normal accruals. To evaluate normal accruals, many standard models have been used by researchers: the Healy (1985) model, the DeAngelo (1986) model, the Jones (1991) model, the industry model (Dechow and Sloan 1991), and the modified Jones model (Dechow et al. 1995). Following Teoh, Welch, et al. (1998a) and Fan (2007), this study employs the most popular cross-sectional standard Jones model and the cross-sectional modified Jones model to estimate normal accruals, which is preferred due to its

power to predict the proxy accurately. The proceeding steps are followed to estimate earnings management:

Step 1: Total accruals estimated for sample firm i in the year t using cash flow approach of total accruals (Hriber & Collins, 2002). The accruals are calculated in this model directly from cash flow statement in the following equation:

$$TA_{it} = NI_{it} - CFO_{it} \quad (4)$$

Where,

- TA_{it} = Total accruals of year t ;
 NI_{it} = Net income;
 CFO_{it} = Operations cash flows; of year t .

Step 2: The results are calculated from equation (4) to estimate the coefficients by using cross-sectional Jones (1991) model. I estimate the model for each year for all non-IPO firms. The primary model for estimating coefficients is based on the following cross-sectional model.

$$TA_{it}/A_{it-1} = \alpha_{1i}(1/A_{it-1}) + \alpha_{2i}(\Delta REV_{it})/A_{it-1} + \alpha_{3i}(PPE_{it})/A_{it-1} + \varepsilon_{it} \quad (5)$$

Where,

- TA_{it} = Total accruals of firm i in year t ;
 A_{it-1} = Total assets of firm i in year $t-1$;
 ΔREV_{it} = Change in sales of firm i in year $t-1$;
 PPE_{it} = Gross value of property, plant and equipment of firm i in year t ;
 α_i = Coefficient of correlation of the variable i ;
 ε_{it} = Residual of firm i at time t .

Step 3: The coefficient estimates of Equation (5) for each year are used to calculate the firm-specific non-discretionary accruals (*NDA*) for the IPO firms:

$$NDA_{it} = \alpha_{1i}(1/A_{it-1}) + \alpha_{2i}(\Delta REV_{it} - \Delta REC_{it})/A_{it-1} + \alpha_{3i}PPE_{it}/A_{it-1} \quad (6)$$

Where,

NDA_{it} = Non-discretionary accruals of year t ;

ΔREV_{it} = Change in revenue measured by change in sales, it relates to sales $t-1$;

ΔREC_{it} = Change in receivables for year t ;

PPE_{it} = Gross value of property, plant, and equipment in year t ;

α_i = Coefficient of correlation of the variable i .

Step 4: When non-discretionary accruals are defined, it is deduced from total accruals. The remaining is the difference that is discretionary accrual. The positive figure means managers exercise increasing accruals and the negative figure indicates that firms have been managing earnings downwards (Jones, 1991).

$$DA_{it} = (TA_{it}/A_{it-1}) - NDA_{it} \quad (7)$$

Where,

DA_{it} = Discretionary accruals year t (based on modified Jone Model).

Table 3.5 List of mediator variables, symbol, measurement, and sources.

Variables	Acronym	Measurement	Expected results	Sources
Abnormal cash flow from operations	AbCFO	A residual term from model used to estimate the normal level of CFO	-	Hao (2013) Alhadab et al. (2015) Purayil and Lukose (2019)
Abnormal discretionary expenditure	AbDEX	A residual term from model used to estimate the normal level of discretionary expenditures	-	Hao (2013) Alhadab et al. (2015) Purayil and Lukose (2019)
Real earnings management	REM	Abnormal cash flow from operations (multiplied by -1) + Abnormal discretionary expenses (multiplied by -1)	-	Hao (2013) Alhadab et al. (2015) Purayil and Lukose (2019)
Accrual-based earnings manipulation	AEM	Discretionary accruals estimated from the Modified Jones Model's by Dechow et al. (1995)	-	Teoh, Wong, et al. (1998a) Fan (2007) Hao (2013) Ertimur et al. (2017)

3.3.4 Control Variable

The model that I will use includes various control variables that could affect financial reporting behavior and performance. And to avoid correlation problems between variables, I insert the following control variables in the model:

Firm Growth

Sales growth reflects the company's capability to compete in the market and maintain its business continuity. A decrease in sales growth indicates a decline in the company's profit-generating capability, which can lead to reduced investor interest. Companies experiencing high sales growth are less likely to engage in earnings management practices, while those with low sales growth are more inclined to resort to such strategies. In a study conducted by Purayil and Lukose (2019) did not find a significant relationship between sales growth and real earnings management during the initial public offering (IPO) year. However, they did observe a negative association

between sales growth and real earnings management in the year following the IPO. This suggests that firms with higher sales growth tend to depend less on earnings management practices, possibly because their financial performance becomes more stable. Furthermore, Kim et al. (2004) discovered that growing firms tend to exhibit improved performance following the IPO, indicating a positive association between growth and post-IPO performance. In light of these findings, I include a growth variable as a control variable to account for potential firm growth effects.

Leverage

Debt is an agreement between a company as a debtor and a creditor. The greater the leverage ratio, the higher the value of the company's debt. Thus, the company's financial leverage can also be a trigger for management to take earnings management. The impact of leverage on earnings management has two different views. On the first side, Dichev and Skinner (2002) and Beatty and Weber (2003) suggested that firms with high leverage are more interested in managing their earnings. Beatty and Weber (2003) found that managers use income-increasing accruals to reduce the possibility for firms to violate debt covenants. On the other side, Jensen (1986) suggests that debt creation reduces managers' opportunistic behaviors. This is due to the control hypotheses for debt creation. Managers use their discretion to control firm cash flow.

Additionally, 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 Kim et al. (2004) and Balatbat et al. (2004) highlight the relationship between leverage and IPO firm operating performance. To accurately assess the impact of leverage on earnings management and IPO firm performance, the total liabilities to total assets ratio is used as a control variable.

Firm Age (Length of Firm Business Operation)

The existing literature suggests several key findings regarding the relationship between firm length of business operation and various performance indicators. Firstly, Maheshwari and Agrawal (2015) indicate that older firms generally possess more well-established management and accounting systems compared to younger firms. This implies that older firms are more likely to have a solid business model and exhibit lower

levels of information asymmetry, which reduces the need or opportunity for engaging in earnings management (Ahmad-Zaluki, Campbell, & Goodacre, 2011). Furthermore, Ritter (1991) and Clark (2002) have observed a positive association between age-at-IPO and post-IPO performance. Their research indicates that, on average, older firms tend to exhibit better three-year post-IPO stock returns. Conversely, Banerjee, Güçbilmez, and Pawlina (2016) find that young first-mover companies tend to experience higher underpricing at IPOs but demonstrate stronger long-term operating performance compared to their older counterparts. Based on these findings, it is evident that age plays a crucial role in understanding performance outcomes. Therefore, in this study, firm age is included as a control variable to effectively capture any potential firm age effects on the variables under investigation.

In addition, I include year and industry dummies to control year and industry effects.

Table 3.6 List of control variables, symbol, measurement, and sources.

Variables	Acronym	Measurement	Sources
Leverage	LEV	Total debt to total assets	Fan (2007) Hao (2013) Alhadab et al. (2015) Kalgo et al. (2016)
Firm growth	GROWTH	Firm growth represents last year revenue change over current year revenue. To obtain a normal distribution, the Johnson transformation method is used.	Kim et al. (2004) Hao (2013) Kalgo et al. (2016) Purayil and Lukose (2019)
Firm age	AGE	The difference between the IPO issue-year and the founding year	Kim et al. (2004) Fan (2007) Hao (2013) Bhatia and Singh (2013) Purayil and Lukose (2019)
Year	YEAR	Year dummies	Hao (2013) Alhadab et al. (2015)
Industry	INDUS	Industry dummies	Hao (2013) Alhadab et al. (2015)

3.4 Data Analysis

In this study, the researcher collected quantitative data in order to examine the association between ownership structure, earnings management, and IPO firm performance. The researcher further used statistical methods corresponding to such study by using statistical analysis of the two features including descriptive statistics and inferential statistics.

3.4.1 Descriptive Statistics

Descriptive statistics were used to explain the basic features of data, comprising frequency, percentage, mean, median, minimum, maximum, and standard deviation of the variables used in this study which included ownership structure, earnings management and IPO firm performance.

3.4.2 Inferential Statistics

Inferential statistics were applied to test the research hypotheses, including Pearson correlation to assess the relationships between variables and multiple regression analysis to examine the association between ownership structure, earnings management, and IPO firm performance.

Recognizing the significance of ensuring the reliability of the data, we subjected the variables used in the analysis to a comprehensive reliability test as outlined below:

3.4.2.1 Outlier Check

In multiple regression analysis, it is important to assess whether there is a linear relationship between the dependent and independent variables. To do this, it is necessary to identify and remove any outliers in the sample, as they can significantly impact the results of the analysis. Outliers were identified using Z-scores, which are standard scores that measure the distance of an observation from the mean in terms of standard deviations. Observations with Z-scores outside of the range of -3 to 3 were considered outliers and excluded from the analysis. This helps to ensure that the sample is representative and not overly influenced by extreme values.

In the pre-IPO year, there were 5 outliers from 77 data sets. To ensure comparability in the analysis, the same dataset was utilized for analysis during the IPO year and after.

3.4.2.2 Normality Test

In multiple regression analysis, it is necessary for the dependent variables and their tolerance to be normally distributed. According to the Central Limit Theorem, the distribution of the sample values tends to be close to the normal distribution if the sample is adequate, which should be greater than 30 (Bland & Altman, 1996). In this study, the sample size was greater than 30, so the dependent variables and the errors were assumed to be normally distributed.

3.4.2.3 Homoscedasticity Test

To assess whether the variance of the errors (tolerance) is constant in multiple regression analysis, a scatter plot of the residuals (differences between predicted and observed values) can be used. If the variance of the errors changes significantly near zero or within a narrow range, it suggests that the assumption of homoscedasticity (constant variance of errors) is not met. However, if the deviations are evenly distributed above and below zero in a narrow range regardless of the value of the predicted variable, it suggests that the variance of the errors is constant. In this case, the scatter plot of the residuals showed that most of the deviations were distributed evenly above and below zero in a narrow range, indicating that the variance of the errors was constant.

3.4.2.4 Autocorrelation

In multiple regression analysis, one important assumption is that the errors (also known as the tolerances) are independent of one another. This can be tested using the Durbin-Watson test, which measures the correlation between errors in consecutive time periods (for time series data) or between errors in different observations (for cross-sectional data). A value of the Durbin-Watson statistic between 1.5 and 2.5 indicates independence of the errors. If the value falls outside of this range, it may suggest the presence of autocorrelation, which can affect the accuracy of the model. In this case, the Durbin-Watson test was conducted and the value was found to be within the range of 1.5 to 2.5, indicating that the errors were independent and no autocorrelation was present.

3.4.2.5 Multicollinearity

In multiple regression analysis, it is important for the independent variables to be independent of one another. If an independent variable is correlated with other independent variables, it can lead to multicollinearity, which can affect the accuracy

of the model. To test for multicollinearity, the Variance Inflation Factor (VIF) can be calculated for each independent variable. A VIF value higher than 10 may indicate multicollinearity (Damodar, 2009). In this case, the VIF values of all independent variables were found to be less than 10, indicating that the independent variables were independent of one another and no multicollinearity was present.

3.4.3 Mediation Analysis

The analysis of mediation employs the causal steps method proposed by Baron and Kenny (1986) and the Sobel test utilizing the Z-statistic. Examining the mediating role of earnings management and examining the significance of indirect effects are the purposes of these approaches. This study primary objective is to determine whether earnings management serves as a mediating variable.

To conduct the mediation test in accordance with Baron and Kenny's (1986) approach, the following steps were followed:

Firstly, assesses the total effect of the independent variable (X) on the dependent variable (Y) by examining the statistical significance of the regression coefficient (c). This step helps determine if there is a significant relationship between the independent and dependent variables.

Secondly, the effect of the independent variable (X) on the mediator variable (Med) is evaluated by analyzing the regression coefficient (a) and its statistical significance. This step investigates the relationship between the independent variable and the mediator variable.

Thirdly, analyzes the effect of the mediator variable (Med) on the dependent variable (Y) while controlling for the independent variable (X). This is done by examining the regression coefficient (b) and its statistical significance. This step allows for understanding the direct relationship between the mediator and the dependent variable when considering the influence of the independent variable.

Lastly, the extent of mediation is determined by examining the regression coefficient (c') of the independent variable (X) while controlling for the mediator variable (Med). If the coefficient (c') is statistically insignificant, it suggests that the mediator fully mediates the relationship between the independent and dependent variables. Conversely, if the coefficient (c') is statistically significant, it indicates partial mediation, suggesting

that the mediator only partially accounts for the relationship. Non-significant coefficients (a or b) indicate the absence of mediation, implying that the mediator does not significantly impact the relationship between the independent and dependent variables.

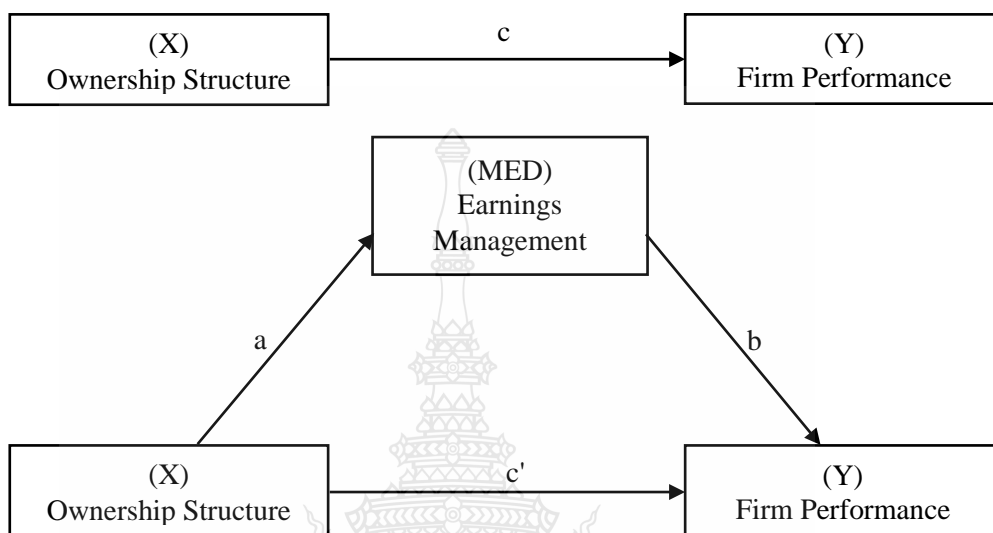


Figure 3.3 Path diagram for mediator model

The formula for the Sobel test is as follows:

$$z = a \cdot b / \text{SQRT}(b^2 \cdot \text{SE}_a^2 + a^2 \cdot \text{SE}_b^2)$$

where:

z is the test statistic, which follows a standard normal distribution under the null hypothesis of no indirect effect.

a is the coefficient for the effect of the predictor variable on the mediator variable, obtained from a regression analysis.

b is the coefficient for the effect of the mediator variable on the outcome variable, obtained from a regression analysis.

SEa and SEb are the standard errors associated with the coefficients a and b, respectively.

The Sobel test evaluates the significance of the indirect effect of the predictor variable on the outcome variable through the mediator variable. If the calculated Z-score

is greater than 1.96 or less than -1.96, it indicates that the indirect effect is statistically significant at the 5% level (assuming a two-tailed test).

3.5 Model Specifications

To test hypotheses, this study develops models to examine the association between ownership structure (ownership concentration and managerial ownership), earnings management, and IPO firm performance by estimating the following regression model.

3.5.1 The Association between Ownership Structure and Firm Performance Pre-IPO year (Year -1)

$$PERF_{i,t-1} = \alpha_0 + \beta_1 CONC_{i,t-1} + \beta_2 MAGE_{i,t-1} + \beta_3 GROWTH_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 AGE_{i,t-1} + Year + IND + \varepsilon_{i,t-1} \quad (11)$$

Where,

- $PERF_{i,t-1}$ = The two main dependent variables are the ROA and ROE of firm i in year $t-1$;
- $CONC_{i,t-1}$ = The proportion of common stock held by the largest shareholder of firm i in the year $t-1$;
- $MAGE_{i,t-1}$ = The proportion of common stock held by the board of directors and executives of firm i in the year $t-1$;
- $GROWTH_{i,t-1}$ = The change in revenue divided by lagged revenue of firm i in the year $t-1$;
- $LEV_{i,t-1}$ = Total debt to total assets of firm i in the year $t-1$;
- $AGE_{i,t-1}$ = Length of firm business operation in the year $t-1$;
- $YEAR$ = The year dummies;
- IND = The industry dummies.

In the IPO year (Year 0)

$$\begin{aligned} PERF_{i,t} &= \alpha_0 + \beta_1 R_CONC_{i,t} + \beta_2 R_MAGE_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 LEV_{i,t} \\ &+ \beta_5 AGE_{i,t} + Year + IND + \varepsilon_{i,t} \end{aligned} \quad (12)$$

Where,

- $PERF_{i,t}$ = The two main dependent variables are the ROA and ROE of firm i in year t ;
- $R_CONC_{i,t}$ = The proportion of common stock retained by the largest shareholder(s), who were the original owners of firm i in the year t ;
- $R_MAGE_{i,t}$ = The proportion of common stock retained by the board of directors and executives who were the original owners of firm i in the year t ;
- $GROWTH_{i,t}$ = The change in revenue divided by lagged revenue of firm i in the year t ;
- $LEV_{i,t}$ = Total debt to total assets of firm i in the year t ;
- $AGE_{i,t}$ = Length of firm business operation in the year t .

Post-IPO years (Year +1)

$$\begin{aligned} PERF_{i,t+1} &= \alpha_0 + \beta_1 CHG_CONC_{i,t+1} + \beta_2 CHG_MAGE_{i,t+1} + \beta_3 GROWTH_{i,t+1} + \\ &\beta_4 LEV_{i,t+1} + \beta_5 AGE_{i,t+1} + Year + IND + \varepsilon_{i,t+1} \end{aligned} \quad (13)$$

Where,

- $PERF_{i,t+1}$ = The two main dependent variables are the ROA and ROE of firm i in year $t+1$;
- $R_CONC_{i,t+1}$ = The proportion of common stock retained by the largest shareholder(s), who were the original owners of firm i in the year $t+1$;
- $R_MAGE_{i,t+1}$ = The proportion of common stock retained by the board of directors and executives who were the original owners of firm i in the year $t+1$;
- $GROWTH_{i,t+1}$ = The change in revenue divided by lagged revenue of firm i in the year $t+1$;
- $LEV_{i,t+1}$ = Total debt to total assets of firm i in the year $t+1$;
- $AGE_{i,t+1}$ = Length of firm business operation in the year $t+1$.

3.5.2 The Association between Ownership Structure and Earnings Management

Pre-IPO year (Year -1)

$$EM_{i,t-1} = \alpha_0 + \beta_1 CONC_{i,t-1} + \beta_2 MAGE_{i,t-1} + \beta_3 GROWTH_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 AGE_{i,t-1} + Year + IND + \varepsilon_{i,t-1} \quad (14)$$

Where,

$$EM_{i,t-1} = \text{The two main dependent variables are the REM and AEM of firm } i \text{ in year } t-1.$$

In the IPO year (Year 0)

$$EM_{i,t} = \alpha_0 + \beta_1 CHG_CONC_{i,t} + \beta_2 CHG_MAGE_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 LEV_{i,t} + \beta_5 AGE_{i,t} + Year + IND + \varepsilon_{i,t} \quad (15)$$

Where,

$$EM_{i,t} = \text{The different proxies for REM and AEM of firm } i \text{ in the year } t.$$

Post-IPO years (Year +1)

$$EM_{i,t+1} = \alpha_0 + \beta_1 CHG_CONC_{i,t+1} + \beta_2 CHG_MAGE_{i,t+1} + \beta_3 GROWTH_{i,t+1} + \beta_4 LEV_{i,t+1} + \beta_5 AGE_{i,t+1} + Year + IND + \varepsilon_{i,t+1} \quad (16)$$

Where,

$$EM_{i,t+1} = \text{The different proxies for REM and AEM of firm } i \text{ in the year } t+1.$$

3.5.3 The Association between Ownership Structure and Firm Performance through Earnings Management

Pre-IPO year (Year -1)

$$PERF_{i,t-1} = \alpha_0 + \beta_1 CONC_{i,t-1} + \beta_2 MAGE_{i,t-1} + \beta_3 GROWTH_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 AGE_{i,t-1} + \beta_6 EM_{i,t-1} + Year + IND + \varepsilon_{i,t-1} \quad (17)$$

In the IPO year (Year 0)

$$PERF_{i,t} = \alpha_0 + \beta_1 CONC_{i,t} + \beta_2 MAGE_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 LEV_{i,t} + \beta_5 AGE_{i,t} + \beta_6 EM_{i,t} + Year + IND + \varepsilon_{i,t} \quad (18)$$

Post-IPO years (Year +1)

$$PERF_{i,t+1} = \alpha_0 + \beta_1 CONC_{i,t+1} + \beta_2 MAGE_{i,t+1} + \beta_3 GROWTH_{i,t+1} + \beta_4 LEV_{i,t+1} + \beta_5 AGE_{i,t+1} + \beta_6 EM_{i,t+1} + Year + IND + \varepsilon_{i,t+1} \quad (19)$$



CHAPTER 4

RESEARCH RESULT

This chapter presents the results and the discussion of the association between ownership structure, earnings management, and performance of the IPO companies listed on the Market for Alternative Investment (MAI) from 2012 to 2017. The companies offering ordinary shares in all industries, except companies in the financial industry group, were included in this study.

The results of data analysis were divided into 3 parts: 1) preliminary data analysis, 2) correlation coefficient analysis, and 3) analysis of the association among ownership structure, earnings management, and performance of IPO firms.

4.1 Descriptive Statistics

This section presents the results of data analysis in the form of descriptive statistics based on data collected from a sample of companies listed on the Market for Alternative Investment (MAI) from 2012 to 2017, including one year prior to the IPO (year -1), IPO year (year 0), one year after the IPO (year +1), two years after the IPO (year +2), and three years after the IPO (year +3). The summary shows the number of observations, as well as the mean, median, standard deviation, minimum, and maximum values of each variable.

Table 4.1 Descriptive statistics of total assets, net income, cash flow from operating activities, selling and administrative expenses, and total accruals (n = 72)

(in Million Baht)

Year	-1	0	+1	+2	+3
<i>Panel A: Total Assets</i>					
Mean	775.86	1,206.28	1,393.86	1,807.55	2,219.88
Median	516.13	702.72	817.96	942.49	1,145.47
Standard deviation	839.11	1,610.59	2,364.11	3,974.55	5,052.12
Minimum	120.92	208.45	216.83	228.00	213.07
Maximum	5,113.98	11,465.57	19,324.80	33,057.23	41,483.58
<i>Panel B: Net income</i>					
Mean	50.59	65.46	82.80	92.87	87.24
Median	37.52	47.68	48.23	32.54	42.95
Standard deviation	87.03	79.93	200.66	328.37	401.63
Minimum	-168.325	-50.379	-80.605	-84.236	-457.783
Maximum	671.524	581.259	1,608.457	2,686.922	3,251.506
<i>Panel C: Cash flows from operations</i>					
Mean	53.44	55.93	94.15	102.44	105.62
Median	48.54	45.73	43.66	51.15	62.07
Standard deviation	94.10	163.50	235.31	363.82	585.94
Minimum	-246.66	-666.86	-153.93	-528.58	-2,119.77
Maximum	296.67	639.52	1,790.03	2,819.79	4,119.30
<i>Panel D: Selling and administrative expenses</i>					
Mean	118.52	130.98	151.39	165.58	171.22
Median	82.25	104.38	111.17	117.60	127.85
Standard deviation	199.62	189.21	228.65	223.30	195.84
Minimum	17.91	23.98	23.06	10.34	32.07
Maximum	1,723.12	1,622.84	1,947.00	1,847.65	1,591.81
<i>Panel E: Total Accruals</i>					
Mean	-2.85	9.53	-11.36	-9.57	-18.38
Median	-11.93	-0.09	-4.24	-24.36	-29.41
Standard deviation	112.47	138.05	96.79	152.20	327.17
Minimum	-442.10	-438.70	-357.20	-352.49	-867.79
Maximum	498.28	729.94	239.37	793.39	2,064.71

Table 4.1 presents descriptive statistics of the general characteristics of the sample: total assets, net income, cash flows from operations, and selling and administrative expenses from year -1 to year +3. The results reveal an increase in the average total assets, net income, and cash flows from operating activities over this period. In year +3, the highest average of total assets was 2,291.88 million baht, and the highest average of cash flows from operating activities was 105.62 million baht. The highest average net income was in year +2 with 92.87 million baht. The data also showed a wide range of selling and administrative expenses. In year +3, the highest average was 171.22 million baht, with the highest value reaching 1591.81 million baht and the lowest value at 32.07 million baht. As for total accruals, the average value was -2.85 million baht in year -1. It increased to 9.53 million baht in year 0, but decreased in years +1, +2, and +3, with an average value of -11.36 million baht, -9.57 million baht, and -18.38 million baht, respectively.

Table 4.2 Descriptive statistics of earnings management proxies (n=72)

Year	-1	0	+1	+2	+3
<i>Panel A: Aggregate real earnings management</i>					
Mean	-0.017	-0.011	0.004	-0.001	0.012
Median	-0.015	0.040	0.017	-0.001	0.001
Standard deviation	0.224	0.231	0.152	0.165	0.189
Minimum	-0.842	-0.766	-0.345	-0.412	-0.547
Maximum	0.756	0.383	0.506	0.392	0.701
<i>Panel B: Abnormal cash flows from operations</i>					
Mean	-0.024	-0.007	-0.006	-0.003	0.016
Median	-0.031	0.007	-0.005	-0.009	-0.003
Standard deviation	0.173	0.178	0.123	0.140	0.157
Minimum	-0.768	-0.492	-0.352	-0.303	-0.270
Maximum	0.478	0.371	0.342	0.377	0.668

Table 4.2 Descriptive statistics of earnings management proxies (Cont.)

Year	-1	0	+1	+2	+3
<i>Panel C: Abnormal discretionary expenses</i>					
Mean	0.006	-0.004	0.010	0.003	-0.003
Median	0.037	0.024	0.020	0.023	0.015
Standard deviation	0.152	0.147	0.098	0.096	0.091
Minimum	-0.556	-0.536	-0.371	-0.318	-0.314
Maximum	0.296	0.198	0.164	0.145	0.164
<i>Panel D: Discretionary accruals</i>					
Mean	0.041	0.044	0.027	0.027	0.019
Median	0.042	0.062	0.030	0.009	-0.004
Standard deviation	0.192	0.140	0.107	0.099	0.138
Minimum	-0.441	-0.442	-0.312	-0.224	-0.172
Maximum	1.164	0.368	0.389	0.312	0.554

Table 4.2 presents descriptive statistics for aggregate real earnings management, abnormal cash flows from operations (sales-based manipulation), abnormal discretionary expenses, and discretionary accruals as a proxy for accrual-based earnings management from year -1 to year +3. In order to measure real earnings management, the same interpretation as the measures of accrual-based earnings management, abnormal cash flows from operations, and abnormal discretionary expenses are multiplied by -1. Consequently, a significant and positive coefficient for both real activity-based and accrual-based earnings management indicates income-increasing earnings management.

Panel A shows the average values of aggregate real earnings management. The analysis reveals that aggregate real earnings management had the lowest average value in year -1 at -0.017. The average gradually increased to -0.011 in year 0 and up to 0.004 in year +1. When examining the median values, the lowest value was -0.015 in year -1, while the highest value was 0.040 in year 0 and 0.017 in year +1. This suggests that the sample may have employed real earnings management strategies to increase earnings during the year of the initial public offering and the year after. When considering each real earnings management activity individually in Panel B, it was found that the average was -0.024 in

year -1 and it gradually increased from -0.007 in year +0 and reached 0.016 in year +3. Regarding abnormal discretionary expenses in Panel C, the averages in each year exhibited significant differences. In year -1, the average was 0.006. However, it decreased to -0.004 in year 0 and increased to 0.10 in year +1. When examining the median values, the highest value was found in year -1 at 0.037, and it gradually decreased to 0.024 in year 0 and 0.020 in year +1.

Panel D shows the discretionary accruals, which serve as a proxy for accrual-based earnings management. The analysis shows that the discretionary accrual was 0.041 in year -1 and increased to 0.044 in year 0. However, it gradually decreased to 0.019 in year +3. These findings suggest that the sample group may have employed an accrual-based earnings management strategy to increase earnings during the IPO period.

Table 4.3 The mean and median changes in earnings management variables of IPO firms

Variable	Year -1 to Year 0	Year -1 to Year +1	Year -1 to Year +2	Year -1 to Year +3
<i>Panel A: Aggregate real earnings management</i>				
Mean changes	0.007	0.022	0.017	0.030
t-Statistic	0.269	0.808	0.741	1.217
Median changes	0.055	0.032	0.015	0.016
z-Statistic	-0.331	-0.819	-1.072	-0.673
<i>Panel B: Abnormal cash flows from operations</i>				
Mean changes	0.017	0.018	0.020	0.039
t-Statistic	0.654	0.682	0.939	1.643
Median changes	0.038	0.026	0.022	0.028
z-Statistic	-0.752	-0.937	-1.308	-1.184
<i>Panel C: Abnormal discretionary expenses</i>				
Mean changes	-0.010	0.004	-0.003	-0.009
t-Statistic	-1.454	0.427	-0.326	-0.884
Median changes	-0.013	-0.017	-0.014	-0.022
z-Statistic	-1.279	-0.438	-1.027	-1.128
<i>Panel D: Discretionary accruals</i>				
Mean changes	0.003	-0.014	-0.014	-0.022
t-Statistic	0.104	-0.470	-0.676	-0.888
Median changes	0.020	-0.012	-0.033	-0.046
z-Statistic	-0.527	-0.516	-0.471	-1.403

Table 4.3 presents the mean and median changes in earnings management proxies during the IPO year and the subsequent years. Changes in earnings management were measured by comparing with year -1, one year before the IPO.

Panel A shows the mean and median changes in aggregate real earnings management. According to the analysis, the mean and median changes are not statistically significant since the mean (median) increased by 0.007 (0.055) in year 0, 0.022 (0.032) in year 1, and 0.030 (0.016) in year 3.

Panel B shows the mean and median changes in abnormal cash flows from operations. According to the analysis, the mean and median changes are not statistically significant since the mean (median) increased by 0.017 (0.038) in year 0, 0.018 (0.026) in year 1, and 0.039 (0.028) in year 3.

Panel C shows the mean and median changes in abnormal discretionary expenses. According to the analysis, the mean and median changes are not statistically significant since the mean (median) decreased by 0.010 (0.013) in year 0, increased (decreased) by 0.004 (0.017) in year 1, and decreased by 0.009 (0.022) in year 3.

Panel D shows the mean and median changes in discretionary accruals. According to the analysis, the mean and median changes are not statistically significant since the mean (median) increased by 0.003 (0.020) in year 0, decreased by 0.014 (0.012) in year 0. 1, and 0.022 (0.046) in year 3.

Table 4.4 Descriptive statistics of dependent variable (n=72)

Year	-1	0	+1	+2	+3
Panel A: Return on assets (%)					
Mean	11.417	9.093	6.886	5.065	4.023
Median	10.025	8.310	6.930	4.300	4.910
Standard deviation	7.914	4.996	6.594	7.976	10.118
Minimum	-3.780	-1.880	-12.680	-21.060	-38.120
Maximum	40.050	25.020	28.910	26.190	28.710
Panel B: Return on equity (%)					
Mean	22.471	13.955	9.521	7.208	4.582
Median	21.800	12.360	9.700	5.230	5.975
Standard deviation	16.266	8.774	10.954	13.279	18.115
Minimum	-29.180	-11.590	-28.750	-28.150	-75.970
Maximum	79.660	35.690	47.730	41.260	43.290

Table 4.4 presents the descriptive statistics of the dependent variables, which encompass IPO firm performance measured by return on assets (ROA) and return on equity (ROE) from year -1 to year +3, with year 0 representing the IPO year. It was observed that the highest average return on assets was 11.42% in year -1, and decreased to 9.09% in year t, and 4.02% in year t+3. In terms of return on equity (ROE), it was 22.47% in year -1, decreased to 13.95% in year 0, and was 4.58% in year +3. These findings suggest that the companies listed on the Market for Alternative Investment (MAI) tend to experience a decrease in performance after the initial public offering. Similarly, Laokulrach (2019) found that small and medium-sized businesses listed on the Market for Alternative Investment (MAI) also exhibited a decline in performance after the initial public offering. Kim et al. (2004) also noted that companies listed on the Stock Exchange of Thailand experience a decline in performance following their initial public offering.

Table 4.5 The mean and median changes in performance variables of IPO firms

Variable	Year -1 to Year 0	Year -1 to Year +1	Year -1 to Year +2	Year -1 to Year +3
Panel A: Return on assets				
Mean changes (%)	-2.325	-4.531	-6.352	-7.394
t-Statistic	-2.275*	-4.043**	-5.339**	-5.186**
Median changes (%)	-1.715	-3.095	-5.725	-5.115
z-Statistic	-2.219*	-3.900**	-4.846**	-4.736**
Panel B: Return on equity				
Mean changes (%)	-8.516	-12.951	-15.263	-17.889
t-Statistic	-4.099**	-5.894**	-6.472**	-6.291**
Median changes (%)	-9.440	-12.100	-16.570	-15.825
z-Statistic	-4.503**	-5.412**	-5.449**	-5.657**

Table 4.5 presents the mean and median changes in performance of IPO firms during the IPO year and the subsequent years. Changes in firm performance were measured by comparing with year -1, one year before the IPO.

Panel A shows the mean and median changes in return on assets (ROA). According to the analysis, the mean and median changes are statistically significant since the mean (median) decreased by 2.32% (1.71%) in year 0, 4.53% (3.09%) in year 1, and 7.39% (5.12%) in year 3.

Panel B shows the mean and median changes in return on equity (ROE). According to the analysis, the mean and median changes are statistically significant since the mean (median) decreased by 8.52% (9.44%) in year 0, 12.95% (12.10%) in year 1, and 17.89% (15.82%) in year 3.

Table 4.6 Descriptive statistics of independent variable (n=72)

Year	-1	0	+1	+2	+3
<i>Panel A: Ownership concentration (%)</i>					
Mean	70.941	51.309	50.711	49.131	48.443
Median	76.498	54.096	52.352	50.921	49.954
Standard deviation	23.888	16.656	16.559	16.257	16.873
Minimum	21.839	15.529	15.529	11.818	4.5341
Maximum	100.000	75.731	75.988	76.206	83.729
<i>Panel B: Managerial ownership (%)</i>					
Mean	56.450	41.784	40.494	37.219	35.140
Median	58.140	44.565	43.045	39.082	35.985
Standard deviation	32.924	24.376	24.191	23.763	23.093
Minimum	0.001	0.001	0.000	0.0000	0.000
Maximum	100.000	84.652	84.652	74.500	73.330

Table 4.6 presents the ownership structure of IPO firms on the Market for Alternative Investment (MAI) during year t-1 to year t+3 with descriptive statistics.

Panel A presents the ownership concentration measured by the shareholding of the first largest shareholders. The average ownership concentration was 70.94% in year -1, and reduced afterwards. The average ownership concentration was 51.31% in year 0, which then decreased to 50.71% in year +1, and continued to decline to 48.44% in year +3.

Panel B presents the managerial ownership measured by the shares held by the board of directors and executive directors. The average of managerial ownership was 56.45% in year -1, but it declined over time. The average of managerial ownership was 41.78% in year 0, which then decreased to 40.49% in year +1, and continued to decline to 35.14% in year t+3.

Table 4.7 The mean and median changes in ownership structure of IPO firms (n=72)

Variable	Year -1 to Year 0	Year -1 to Year +1	Year -1 to Year +2	Year -1 to Year +3
Panel A: Ownership concentration				
Mean Difference (%)	-19.632	-20.230	-21.811	-22.498
t-Statistics	-18.045**	-18.065**	-16.851**	-14.524**
Median changes (%)	-22.402	-24.147	-25.578	-26.545
z-Statistic	-7.368**	-7.374**	-7.346**	-7.200**
Panel B: Managerial ownership				
Mean Difference (%)	-14.666	-15.956	-19.231	-21.310
t-Statistics	-12.400**	-12.095**	-11.288**	-10.421**
Median changes (%)	-13.575	-15.095	-19.058	-22.155
z-Statistic	-7.183**	-7.104**	-6.987**	-6.908**

Notes: Differences in means are tested using paired samples t-test, test and differences in medians are tested using Wilcoxon signed ranks test.

*, ** Indicate .05, and .01 significance levels, respectively.

Table 4.7 presents the mean and median changes in the ownership structure of IPO firm during the IPO year and the subsequent years. Changes in ownership structure were measured by comparing with year -1, one year before the IPO.

Panel A shows the mean and median changes in ownership concentration. According to the analysis, the mean and median of the largest shareholder's shareholding percentage changed significantly since the mean (median) decreased by 19.63% (22.40%) in year 0, 20.23% (24.15%) in year +1, and 22.50% (26.55%) in year 3.

Panel B shows the mean and median changes in managerial ownership. According to the analysis, the mean and median of managerial ownership have

significantly decreased since the mean (median) decreased by 14.67% (13.58%) in year 0, -5.96% (-5.09%) in year 1, and -1.31% (-2.15%) in year +3.

Table 4.8 Descriptive statistics of control variable (n=72)

Year	-1	0	+1	+2	+3
<i>Panel A: Firm age (year)</i>					
Mean	16.278	17.278	18.278	19.278	20.278
Median	15.500	16.500	17.500	18.500	19.500
Standard deviation	8.202	8.202	8.202	8.202	8.202
Minimum	1.000	2.000	3.000	4.000	5.000
Maximum	34.000	35.000	36.000	37.000	38.000
<i>Panel B: Leverage (%)</i>					
Mean	54.467	33.362	34.661	37.260	39.318
Median	53.620	32.653	32.426	36.433	38.158
Standard deviation	17.503	15.428	17.380	17.746	19.069
Minimum	18.077	8.440	2.603	4.531	7.264
Maximum	88.077	69.054	69.569	74.257	74.141
<i>Panel C: Firm Growth (%)</i>					
Mean	30.615	19.610	12.614	12.852	10.635
Median	10.677	8.697	10.353	2.033	7.363
Standard deviation	94.788	62.095	26.576	49.763	37.771
Minimum	-63.973	-42.729	-84.385	-40.957	-93.904
Maximum	731.157	485.118	99.635	309.679	133.371

Table 4.8 presents control variables, which included firm age (length of firm business operation), leverage, and firm growth from year -1 to year +3, with descriptive statistics. It was found that the average length of business operation for firms in the IPO year was 17.28 years. The oldest business had been in operation for 35 years, while the youngest age had just 2 years of operation. This aligns with the qualifications required for companies to submit an application for listing on the Market for Alternative Investment.

In terms of firm growth, the highest average was 30.61% in year -1, and continuously decreased over time. By year +3, the average firm growth had reduced to

10.64%. Obviously, the income of IPO companies in the Market for Alternative Investment (MAI) declined after the initial public offering.

Regarding leverage, as measured by the total-debt-to-total-asset ratio, the highest average ratio was 54.47% in year -1, which decreased to 33.36% in year 0, and then increased to 39.32% by year +3. It is clear that the leverage was reduced in the IPO year, and increased in the subsequent years.

Table 4.9 Variables definition/ measurement

Acronym	Variables	Definition
CONC	Ownership concentration	The proportion of common stocks held by the largest shareholder before the IPO.
MANG	Managerial ownership	The proportion of common stocks held by the board of directors and executives before the IPO.
R_CONC	Retention of ownership concentration	The proportion of common stocks retained by the largest shareholder, who was an original owner.
R_MANG	Retention of managerial ownership	The proportion of common stocks retained by the board of directors and executives, who were the original owners.
EM	Earnings management	Real earnings manipulation (REM) and accrual-based earnings manipulation (AEM)
REM	Real earnings management	$AbCFO + AbDEX$
AbCFO	Abnormal cash flow from operations	A residual term from model used to estimate the normal level of CFO (Multiplied by -1)
AbDEX	Abnormal discretionary expenses	A residual term from model used to estimate the normal level of discretionary expenditures (Multiplied by -1)
AEM	Accrual-based earnings management	Discretionary accruals based on modified Jone Model (Dechow et al., 1995)

Table 4.9 Variables definition/ measurement (Cont.)

Acronym	Variables	Definition
ROA	Return on assets	Before-tax-and-interest operating income divided by the total assets
ROE	Return on equity	After-tax net income divided shareholders' Equity
LEV	Leverage	Total debt to total assets
GROWTH	Firm growth	Firm growth represents last year revenue change over current year revenue. To obtain a normal distribution, the Johnson transformation method is used.
AGE	Firm age (Length of firm business operation)	The difference between the IPO issue-year and the founding year
YEAR	Year	Year dummies
INDUS	Industry	Industry dummies include seven distinct industry groups: 1) Service, 2) Industrials Group, 3) Consumer Products Group, 4) Property and Construction Group, 5) Resources, 6) Technology Group, and 7) Agro and Food Industry

4.2 Correlation Matrix

In this research, Pearson's correlation coefficient (r) was used to analyze the relationship between variables and evaluate the association between them. Multiple regression analysis was then performed to test the relationship between the independent and dependent variables and to examine the relationship between the independent variables. A positive correlation coefficient indicates a positive relationship between two variables, while a negative correlation coefficient indicates an inverse relationship. The results of this analysis are shown in Tables 4.10–4.12.

Table 4.10 Correlation matrix of all variables in the pre-IPO year (Year -1)

	ROA	ROE	CONC	MANG	GROWTH	LEV	AGE	REM	AbCFO	AbDEX	AEM
ROA	1										
ROE	.871**	1									
CONC	.028	.018	1								
MANG	.227	.383**	.026	1							
GROWTH	.026	-.011	.072	-.095	1						
LEV	-.521**	-.258*	-.054	.006	.234*	1					
AGE	-.008	-.034	.124	.134	-.013	-.073	1				
REM	-.453**	-.491**	.116	-.217	-.228	.078	-.082	1			
AbCFO	-.597**	-.528**	.063	-.110	-.065	.282*	-.199	.738**	1		
AbDEX	.013	-.123	.100	-.194	-.263*	-.207	.105	.635**	-.052	1	
AEM	-.086	-.044	.103	.058	-.258*	.026	-.138	.506**	.651**	.004	1

Note: *, ** Indicate .05, and .01 significance levels, respectively.

Table 4.11 Correlation matrix of all variables in the IPO year (Year 0)

	ROA	ROE	R_CONC	R_MANG	GROWTH	LEV	AGE	REM	AbCFO	AbDEX	AEM
ROA	1										
ROE	.896**	1									
R_CONC	.043	.085	1								
R_MANG	.161	.165	.061	1							
GROWTH	.401**	.519**	-.004	-.056	1						
LEV	-.279*	-.037	-.128	-.078	.124	1					
AGE	.110	.120	.126	.179	-.205	-.071	1				
REM	-.360**	-.334**	-.027	-.151	-.113	.143	.053	1			
AbCFO	-.337**	-.295*	-.094	.036	.052	.249*	-.045	.771**	1		
AbDEX	-.159	-.169	.072	-.281*	-.240*	-.076	.137	.641**	.005	1	
AEM	-.157	-.167	-.028	.019	-.074	.126	-.020	.731**	.854**	.118	1

Note: *, ** Indicate .05, and .01 significance levels, respectively.

Table 4.12 Correlation matrix of all variables in the post-IPO year (Year +1)

	ROA	ROE	R_CONC	R_MANG	GROWTH	LEV	AGE	REM	AbCFO	AbDEX	AEM
ROA	1										
ROE	.949**	1									
R_CONC	-.034	-.009	1								
R_MANG	.117	.156	.087	1							
GROWTH	.387**	.402**	.032	.054	1						
LEV	-.163	-.017	-.012	.017	.245*	1					
AGE	.022	.015	.152	.203	-.048	-.036	1				
REM	-.367**	-.345**	.108	-.062	-.093	.081	.267*	1			
AbCFO	-.415**	-.397**	.108	.034	.073	.218	.203	.771**	1		
AbDEX	-.022	-.012	.026	-.142	-.241*	-.163	.147	.535**	-.125	1	
AEM	-.012	.007	.067	.050	.085	.096	.167	.697**	.803**	.021	1

Note: *, ** Indicate .05, and .01 significance levels, respectively.

The consideration of the correlation coefficients between the independent variables in the pre-IPO year (year t-1), IPO year (year t), and one year after the IPO (year t+1), it was found that there is no independent variable with a relationship greater than 0.90 (Gujarati, 2003), indicating that there is no multicollinearity among the independent variables. However, the researchers will also consider the Variance Inflation Factor (VIF) to check for multicollinearity among the independent variables before proceeding with further analysis. VIF is used to assess the degree of multicollinearity in a multiple regression model by measuring the correlation between the independent variables. A VIF value greater than 10 (Gujarati, 2003) indicates a strong presence of multicollinearity and may require further investigation.

4.3 Hypothesis Analysis

4.3.1 Empirical Results and Analysis of the Association between Ownership Structure and Performance of IPO Firm

4.3.1.1 Ownership Structure and Firm Performance in the Pre-IPO Year (year -1)

In order to find an answer to the research question of whether pre-IPO ownership structure is associated with firm performance, the research hypotheses to examine such an association were developed as follows:

Hypothesis 1.1: Ownership structure is positively associated with firm performance in the pre-IPO year.

Hypothesis 1.1a Ownership concentration is positively associated with return on assets in the pre-IPO year.

Hypothesis 1.1b Ownership concentration is positively associated with return on equity in the pre-IPO year.

Hypothesis 1.1c Managerial ownership is positively associated with return on assets in the pre-IPO year.

Hypothesis 1.1d Managerial ownership is positively associated with return on equity in the pre-IPO year.

The regression results of ownership structure and firm performance in the pre-IPO (year t-1) are presented in Table 4.13. Model 1 shows the association between the ownership structure and return on assets (ROA), and Model 2 shows the association between the ownership structure and return on equity (ROE).

As shown in Table 4.13, there was no statistically significant association between ownership concentration (CONC) and ROA, ownership concentration (CONC) and ROE. There was a statistically significant positive association between managerial ownership (MANG) and ROA ($\beta=.216$, $p=.040$), managerial ownership (MANG) and ROE ($\beta=.368$, $p=.001$).

Regarding the other variables, there was a statistically significant negative association between leverage (LEV) and ROA ($\beta=-.544$, $p=.000$). Similarly, there was a statistically significant negative association between LEV and ROE ($\beta=-.256$, $p=.017$) and between firm length of business operation (AGE) and ROE ($\beta=-.284$, $p=.011$).

In conclusion, the study demonstrates that there was no significant association between ownership concentration and firm performance in the pre-IPO year as measured by ROA and ROE. This indicates that the largest shareholders do not have a direct influence on the firm performance. However, a significant positive association was found between managerial ownership, ROA, and ROE. This indicates that firms with higher levels of managerial ownership tend to show better performance. Thus, hypotheses 1.1a and 1.1b are not supported, whereas hypotheses 1.1c and 1.1d are supported. In addition, as a control variable, leverage was found to have a significant negative association with ROA and ROE, indicating that firms with lower leverage tend to exhibit higher performance.

Table 4.13 The association between ownership structure and firm performance in the pre-IPO year (Year -1)

Independent Variables	Dependent Variables							
	Model 1: ROA				Model 2: ROE			
	B	Beta	t	VIF	B	Beta	t	VIF
Constant	24.963		5.572**		35.203		3.730**	
CONC	.017	.049	.525	1.152	.062	.090	.931	1.152
MANG	.052	.216	2.101*	1.371	.182	.368	3.496**	1.371
GROWTH	.910	.126	1.236	1.348	.736	.050	.475	1.348
LEV	-24.587	-.544	-5.377**	1.330	-23.793	-.256	-2.471*	1.330
AGE	-.175	-.181	-1.732	1.426	-.563	-.284	-2.646*	1.426
Year11	-1.015	-.041	-.360	1.657	.211	.004	.036	1.657
Year12	1.330	.065	.520	2.036	-.643	-.015	-.119	2.036
Year13	-2.399	-.130	-.992	2.222	-4.579	-.120	-.899	2.222
Year14	-3.337	-.147	-1.250	1.796	-8.639	-.185	-1.536	1.796
Year15	3.609	.171	1.383	1.993	6.747	.156	1.227	1.993
INDUS2	.029	.002	.014	1.635	.618	.016	.138	1.635
INDUS3	-7.691	-.224	-2.109*	1.470	-22.221	-.315	-2.893**	1.470
INDUS4	3.363	.148	1.365	1.528	6.230	.133	1.201	1.528
INDUS5	-5.670	-.239	-2.213*	1.513	-18.679	-.382	-3.460**	1.513
INDUS6	-2.744	-.110	-1.056	1.405	-8.612	-.168	-1.573	1.405
INDUS7	-5.624	-.164	-1.691	1.222	-11.306	-.160	-1.614	1.222
Adj. R ²			.454				.427	
F-statistic			4.693**				4.305**	
Durbin-Watson			2.054				2.203	
Observations			72				72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

CONC = ownership concentration; MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

4.3.1.2 The Retention of Ownership and Firm Performance in the IPO Year (Year 0)

In order to find an answer to the research question of whether post-IPO ownership structure impacts firm performance, the research hypotheses to investigate this impact were developed as follows:

Hypothesis 1.2: The retention of ownership structure is positively associated with firm performance in the IPO year.

Hypothesis 1.2a: The retention of ownership concentration is positively associated with return on assets in the IPO year.

Hypothesis 1.2b: The retention of ownership concentration is positively associated with return on equity in the IPO year.

Hypothesis 1.2c: The retention of managerial ownership is positively associated with return on assets in the IPO year.

Hypothesis 1.2d: The retention of managerial ownership is positively associated with return on equity in the IPO year.

The regression results of the retention of ownership and firm performance in the IPO year are presented in Table 4.14. Model 1 presents the association between the retention of ownership and return on assets (ROA), and Model 2 presents the association between the retention of ownership and return on equity (ROE).

According to Table 4.14, there was no statistically significant association between the retention of ownership concentration (R_CONC) and ROA, as well as between the retention of ownership concentration (R_CONC) and ROE. Conversely, a statistically significant positive association was found between the retention of managerial ownership (R_MANG) and ROE ($\beta=.271$, $p=.018$). However, there was no statistically significant association between the retention of managerial ownership (R_MANG) and ROA.

Regarding the other variables, a statistically significant positive association was found between firm growth (GROWTH) and ROA ($\beta=.458$, $p=.000$) and between firm growth (GROWTH) and ROE ($\beta=.576$, $p=.000$). Conversely, a statistically significant negative association was found between leverage (LEV) and ROA ($\beta=-.344$, $p=.003$).

In conclusion, the results show that there is no significant association between ownership retention by the largest shareholder (ownership concentration) and firm performance, as measured by ROA and ROE, in the IPO year. In addition, there was no significant association between managerial ownership retention and ROA. However, the study showed a positive association between managerial ownership retention and the ROE. This indicates that the retention of managerial ownership during the IPO year does

not directly impact firm asset management effectiveness. Nonetheless, it impacts management's efforts to generate returns for shareholders. Thus, hypotheses 1.2a, 1.2b, and 1.2c are not supported, whereas hypothesis 1.2d is supported.

In terms of control variables, firm growth was significantly positively associated with ROA and ROE. However, leverage was negatively associated with ROA. It indicates that firms with higher revenue growth and lower leverage tend to exhibit higher performance.

Table 4.14 The association between ownership retention and firm performance in the IPO year (Year 0)

Independent Variables	Dependent Variables							
	Model 1: ROA				Model 2: ROE			
	B	Beta	t	VIF	B	Beta	t	VIF
Constant	10.088		3.560**		8.408		1.794	
R_CONC	-.013	-.043	-.392	1.164	.024	.046	.442	1.164
R_MANG	.044	.217	1.833	1.350	.097	.271	2.432*	1.350
GROWTH	2.324	.458	3.881**	1.344	5.132	.576	5.182**	1.344
LEV	-11.128	-.344	-3.156**	1.145	-7.587	-.133	-1.301	1.145
AGE	.107	.176	1.432	1.450	.185	.173	1.501	1.450
Year12	.945	.060	.453	1.683	3.570	.129	1.036	1.683
Year14	-1.149	-.098	-.707	1.870	-2.843	-.139	-1.057	1.870
Year15	-3.276	-.228	-1.717	1.708	-5.903	-.234	-1.871	1.708
Year16	-.100	-.008	-.053	1.918	-3.150	-.135	-1.015	1.918
Year17	-2.355	-.177	-1.301	1.785	-2.491	-.107	-.832	1.785
INDUS2	1.325	.111	.869	1.578	3.650	.174	1.447	1.578
INDUS3	-1.270	-.059	-.490	1.386	-2.377	-.062	-.554	1.386
INDUS4	.237	.017	.127	1.637	-.089	-.004	-.029	1.637
INDUS5	1.345	.090	.721	1.491	3.467	.132	1.125	1.491
INDUS6	.090	.006	.047	1.416	.777	.028	.246	1.416
INDUS7	2.776	.128	1.137	1.226	2.772	.073	.687	1.226
Adj. R ²			.265				.348	
F-statistic			2.597**				3.368**	
Durbin-Watson			2.008				2.030	
Observations			72				72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

4.3.2.3 The Retention of Ownership and Firm Performance in the Post-IPO Year (Year +1)

In order to find an answer to the research question of whether post-IPO ownership structure impacts firm performance, the research hypotheses to investigate this impact were developed as follows:

Hypothesis 1.3: The retention of ownership structure is positively associated with firm performance in the post-IPO year.

Hypothesis 1.3a: The retention of ownership concentration is positively associated with return on assets in the post-IPO year.

Hypothesis 1.3b: The retention of ownership concentration is positively associated with return on equity in the post-IPO year.

Hypothesis 1.3c: The retention of managerial ownership is positively associated with return on assets in the post-IPO year.

Hypothesis 1.3d: The retention of managerial ownership is positively associated with return on equity in the post-IPO year.

The regression results of the retention of ownership and firm performance in the post-IPO year are presented Table 4.15 Model 1 presents the association between the retention of ownership and return on assets (ROA), and Model 2 presents the association between the retention of ownership and return on equity (ROE).

According to Table 4.15, there was no statistically significant association between the retention of ownership concentration (R_CONC) and the retention of managerial ownership (R_MANG) with firm performance, as measured by ROA and ROE.

Regarding the other variables, there was a statistically significant positive association between firm growth (GROWTH) and ROA ($\beta=.463$, $p=.001$), as well as firm growth (GROWTH) and ROE ($\beta=.461$, $p=.001$). Conversely, there was a statistically significant negative association at the .05 level between leverage (LEV) and ROA ($\beta=-.264$, $p=.043$).

In conclusion, the results showed no significant association between ownership retention by the largest shareholder (ownership concentration), managerial ownership, and firm performance, as measured by ROA and ROE, in the post-IPO year.

This indicates that ownership retention by the largest shareholder and managerial shareholders has no direct effect on firm performance. Thus, hypotheses 1.3a, 1.3b, 1.3c and 1.3d are not supported. In terms of control variables, firm growth was significantly positively associated with ROA and ROE. However, leverage was negatively associated with ROA. This indicates that firms with higher revenue growth rates and lower leverage tend to have better performance.

Table 4.15 The association between ownership retention and firm performance in the post-IPO year (Year +1)

Independent Variables	Dependent Variables							
	Model 1: ROA				Model 2: ROE			
	B	Beta	t	VIF	B	Beta	t	VIF
Constant	8.480		2.268*		7.469		1.182	
R_CONC	-.033	-.082	-.671	1.145	-.038	-.057	-.457	1.145
R_MANG	.025	.091	.687	1.338	.060	.132	.982	1.338
GROWTH	3.381	.463	3.503**	1.246	5.588	.461	3.426**	1.340
LEV	-10.001	-.264	-2.067*	1.340	-8.262	-.131	-1.010	1.246
AGE	.041	.051	.374	1.439	.057	.043	.309	1.439
Year13	1.483	.071	.503	1.537	3.055	.088	.613	1.537
Year14	2.101	.123	.862	1.570	3.895	.138	.946	1.570
Year16	1.336	.071	.490	1.587	2.144	.068	.466	1.587
Year17	-.046	-.003	-.017	1.858	-1.482	-.051	-.321	1.858
Year18	-1.326	-.075	-.502	1.728	-1.896	-.065	-.425	1.728
INDUS2	.630	.040	.268	1.708	1.998	.076	.503	1.708
INDUS3	1.318	.046	.331	1.483	4.151	.087	.618	1.483
INDUS4	1.389	.073	.518	1.535	1.906	.061	.421	1.535
INDUS5	1.542	.078	.558	1.490	3.397	.103	.728	1.490
INDUS6	3.216	.154	1.117	1.462	6.479	.187	1.332	1.462
INDUS7	3.341	.117	.914	1.254	4.900	.103	.793	1.254
Adj. R ²			.073				.041	
F-statistic			1.352				1.191	
Durbin-Watson			2.158				2.160	
Observations			72				72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.16 presents a summary of the test results for the hypotheses that ownership structure is positively associated with firm performance during the IPO period.

The results of the first hypothesis test indicate no significant association between ownership concentration and both return on assets and return on equity across the periods before, during, and after the IPO. This suggests that the largest shareholder does not have a direct impact on the firm performance during the IPO event. Concurrently, managerial ownership exhibits a positive association with return on assets and return on equity in the year before the initial public offering (IPO). During the IPO year, retaining ownership by the management does not show a relationship with the return on assets. However, it maintains a connection with the return on equity. Notably, the confidence level has decreased from 99% to 95%, implying a diminishing impact of managerial ownership on firm performance. Following a post-IPO analysis, there is no correlation between retaining ownership by the management and both the return on assets and the return on equity. This suggests that the influence of managerial ownership on firm performance diminishes after the IPO year.

Table 4.16 Summary of the results of Hypotheses 1 testing

	Hypothesis	Pre-IPO Year	IPO Year	Post- IPO Year
H1	Ownership structure is positively associated with firm performance.			
H1.1	Ownership structure is positively associated with firm performance in the pre-IPO year.			
H1.1a	Ownership concentration is positively associated with return on assets in the pre-IPO year.	Not Supported		
H1.1b	Ownership concentration is positively associated with return on equity in the pre-IPO year.	Not Supported		
H1.1c	Managerial ownership is positively associated with return on assets in the pre-IPO year.	Supported		
H1.1d	Managerial ownership is positively associated with return on equity in the pre-IPO year.	Supported		

Table 4.16 Summary of the results of Hypotheses 1 testing (Cont.)

	Hypothesis	Pre-IPO Year	IPO Year	Post-IPO Year
H1.2	The retention of ownership structure is positively associated with firm performance in the IPO year.			
H1.2a	The retention of ownership concentration is positively associated with return on assets in the IPO year.		Not Supported	
H1.2b	The retention of ownership concentration is positively associated with return on equity in the IPO year.		Not Supported	
H1.2c	The retention of managerial ownership is positively associated with return on assets in the IPO year.		Not Supported	
H1.2d	The retention of managerial ownership is positively associated with return on equity in the IPO year.		Supported	
H1.3	The retention of ownership structure is positively associated with firm performance in the post-IPO year.			
H1.3a	The retention of ownership concentration is positively associated with return on assets in the post-IPO year.			Not Supported
H1.3b	The retention of ownership concentration is positively associated with return on equity in the post-IPO year.			Not Supported
H1.3c	The retention of managerial ownership is positively associated with return on assets in the post-IPO year.			Not Supported
H1.3d	The retention of managerial ownership is positively associated with return on equity in the post-IPO year.			Not Supported

4.3.2 Empirical Results and Analysis of the Association between Ownership Structure and Earnings Management

4.3.2.1 Ownership Structure and Earnings Management in the Pre-IPO Year (year t-1)

In order to find an answer to the research question of whether pre-IPO ownership structure is associated with earnings management, the research hypotheses to examine such an association were developed as follows:

Hypothesis 2.1: Ownership structure is negatively associated with earnings management in the pre-IPO year.

Hypothesis 2.1a: Ownership concentration is negatively associated with real earnings management in the pre-IPO year.

Hypothesis 2.1b: Ownership concentration is negatively associated with accrual-based earnings management in the pre-IPO year.

Hypothesis 2.1c: Managerial ownership is negatively associated with real earnings management in the pre-IPO year.

Hypothesis 2.1d: Managerial ownership is negatively associated with accrual-based earnings management in the pre-IPO year.

The regression results of ownership structure and earnings management in the pre-IPO year (year t-1) are presented in Table 4.17. Model 1 shows the association between ownership structure and real earnings management (REM), Model 2 shows the association between ownership structure and abnormal cash flow from operations (AbCFO), Model 3 shows the association between ownership structure and abnormal discretionary expenses (AbDEX), and Model 4 shows the association between ownership structure and accrual-based earnings management (AEM).

According to Table 4.17, there was no statistically significant association among ownership concentration (CONC), real earnings management (REM), and accrual-based earnings management (AEM). However, there was a statistically significant negative association between managerial ownership (MANG) and real earnings management (REM) ($\beta = -.293$, $p = .019$). On the other hand, there was no statistically significant association between managerial ownership (MANG) and accrual-based earnings management (AEM).

When considering each activity of real earnings management (REM) individually, there was no statistically significant association between managerial ownership (MANG) and abnormal cash flow from operations (AbCFO). However, there was a statistically significant negative association between managerial ownership (MANG) and abnormal discretionary expenses (AbDEX) ($\beta = -.262$, $p = .034$).

Regarding the other variables, statistically significant negative associations were found between firm growth (GROWTH) and real earnings management (REM) ($\beta = -.313$, $p = .012$), firm growth (GROWTH) and accrual-based earnings management (AEM) ($\beta = -.308$, $p = .011$), as well as firm growth (GROWTH) and abnormal discretionary expenses (AbDEX) ($\beta = -.287$, $p = .020$). On the other hand, there was a statistically significant positive association between leverage (LEV) and abnormal cash flow from operations (AbCFO) ($\beta = .314$, $p = .017$).

In conclusion, the results showed no significant association between ownership concentration and earnings management (REM and AEM) in the pre-IPO year. However, there was a significantly negative association between managerial ownership and real earnings management. This indicates that firms with lower managerial ownership are more likely to engage in real earnings management through sales manipulation and discretionary expense reduction in order to increase their earnings. Thus, hypotheses 2.1a, 2.1b, and 2.1d are not supported, whereas hypothesis 2.1c is supported.

Moreover, the study revealed a significant negative association between firm growth and earnings management, including both real (REM) and accrual-based (AEM) methods. This indicated that firms with lower revenue growth rates are more likely to employ earnings management to increase their earnings. In addition, a positive association was found between leverage and abnormal cash flow from operations, indicating that firms with high leverage are more likely to engage in real earnings management through sales manipulation, aiming to increase their earnings.

Table 4.17 The association between ownership structure and earnings management in the pre-IPO year (Year -1)

Independent Variables	Dependent Variables															
	Model 1: REM				Model 2: AbCFO				Model 3: AbDEX				Model 4: AEM			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	-.213		-1.420		-.182		-1.466		-.031		-.306		.015		.121	
CONC	.001	.085	.765	1.152	.001	.004	.038	1.152	.001	.121	1.093	1.152	-.001	-.007	-.064	1.152
MANG	-.002	-.293	-2.410*	1.371	-.001	-.150	-1.150	1.371	-.001	-.262	-2.170*	1.371	.000	-.083	-.695	1.371
GROWTH	-.064	-.313	-2.604*	1.348	-.024	-.155	-1.199	1.348	-.040	-.287	-2.399*	1.348	-.054	-.308	-2.616*	1.348
LEV	.219	.171	1.431	1.330	.311	.314	2.451*	1.330	-.092	-.106	-.891	1.330	.065	.060	.510	1.330
AGE	.002	.075	.603	1.426	-.002	-.072	-.545	1.426	.004	.193	1.570	1.426	-.003	-.113	-.929	1.426
Year11	.099	.140	1.050	1.657	.120	.219	1.534	1.657	-.021	-.043	-.328	1.657	.215	.354	2.712**	1.657
Year12	.118	.204	1.382	2.036	.080	.180	1.135	2.036	.038	.097	.658	2.036	.083	.167	1.155	2.036
Year13	.140	.267	1.728	2.222	.080	.197	1.189	2.222	.060	.170	1.107	2.222	.013	.029	.189	2.222
Year14	.079	.123	.885	1.796	.045	.090	.602	1.796	.035	.079	.575	1.796	.004	.007	.053	1.796
Year15	.005	.009	.059	1.993	.013	.029	.186	1.993	-.008	-.021	-.141	1.993	.195	.382	2.663**	1.993
INDUS2	-.006	-.011	-.085	1.635	-.045	-.109	-.766	1.635	.039	.108	.818	1.635	-.041	-.090	-.692	1.635
INDUS3	.350	.360	2.863**	1.470	.263	.349	2.596*	1.470	.087	.133	1.063	1.470	.272	.327	2.659**	1.470
INDUS4	.022	.034	.269	1.528	-.035	-.069	-.506	1.528	.057	.130	1.024	1.528	.011	.019	.154	1.528
INDUS5	.112	.166	1.302	1.513	.027	.053	.386	1.513	.084	.185	1.463	1.513	-.027	-.047	-.377	1.513
INDUS6	.085	.119	.972	1.405	.014	.025	.191	1.405	.071	.148	1.212	1.405	-.043	-.071	-.586	1.405
INDUS7	-.207	-.213	-1.859	1.222	.020	.027	.216	1.222	-.227	-.346	-3.035**	1.222	.010	.012	.107	1.222
Adj. R ²			.237				.125				.247				.268	
F-statistic			2.279**				1.635				2.453**				2.624**	
Durbin-Watson			2.114				1.869				2.095				1.863	
Observations			72				72				72				72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

CONC = ownership concentration; MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

4.3.2.2 The Retention of Ownership and Earnings Management in the IPO Year (year t)

In order to find an answer to the research question of whether post-IPO ownership structure impacts earnings management, the research hypotheses to investigate this impact were developed as follows:

Hypothesis 2.2: The retention of ownership concentration is negatively associated with earnings management in the IPO year.

Hypothesis 2.2a: The retention of ownership concentration is negatively associated with real earnings management in the IPO year.

Hypothesis 2.2b: The retention of ownership concentration is negatively associated with accrual-based earnings management in the IPO year.

Hypothesis 2.2c: The retention of managerial ownership is negatively associated with real earnings management in the IPO year.

Hypothesis 2.2d: The retention of managerial ownership is negatively associated with accrual-based earnings management in the IPO year.

The regression results of the retention of ownership and earnings management in the IPO year are presented in Table 4.18. Model 1 shows the association between the retention of ownership and real earnings management (REM), Model 2 shows the association between the retention of ownership and abnormal cash flow from operations (AbCFO), Model 3 shows the association between the retention of ownership and abnormal discretionary expenses (AbDEX), and Model 4 shows the association between the retention of ownership and accrual-based earnings management (AEM).

As shown in Table 4.18, there was no statistically significant association between the retention of ownership concentration (R_CONC) and real earnings management (REM) or accrual-based earnings management (AEM). In addition, there was no significant association between the retention of managerial ownership (R_MANG) and real earnings management (REM) or accrual-based earnings management (AEM).

When considering each activity of real earnings management (REM) individually, there was no statistically significant association between managerial ownership (MANG) and abnormal cash flow from operations (AbCFO). However, there

was a statistically significant negative association between the retention of managerial ownership (R_MANG) and abnormal discretionary expenses (AbDEX) ($\beta = -.351$, $p = .003$).

In conclusion, the results showed no significant association between the retention of ownership concentration, managerial ownership, and real and accrual-based earnings management in the IPO year. Therefore, hypotheses 2.2a, 2.2b, 2.2c and 2.2d are not supported. However, there was a significantly negative association between managerial ownership and abnormal discretionary expenses. This indicates that firms with lower managerial ownership are more likely to engage in real earnings management by employing cost-cutting measures in discretionary expenses.



Table 4.18 The association between ownership retention and earnings management in the IPO year (Year 0)

Independent Variables	Dependent Variables															
	Model 1: REM				Model 2: AbCFO				Model 3: AbDEX				Model 4: AEM			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	-.066		-.468		-.047		-.387		-.020		-.244		-.020		-.204	
R_CONC	.000	-.013	-1.106	1.164	-.001	-.081	-.617	1.164	.001	.078	.736	1.164	.000	-.019	-1.141	1.164
R_MANG	-.002	-.252	-1.971	1.350	.000	-.036	-.257	1.350	-.002	-.351	-3.075**	1.350	.000	-.050	-.353	1.350
GROWTH	-.010	-.045	-.350	1.344	.006	.032	.225	1.344	-.016	-.108	-.950	1.344	-.015	-.105	-.734	1.344
LEV	.157	.105	.889	1.145	.248	.216	1.656	1.145	-.092	-.096	-.913	1.145	.121	.133	1.013	1.145
AGE	.003	.106	.800	1.450	-.001	-.050	-.339	1.450	.004	.226	1.909	1.450	-.001	-.055	-.371	1.450
Year12	-.030	-.041	-.290	1.683	.031	.055	.345	1.683	-.061	-.131	-1.023	1.683	.090	.203	1.276	1.683
Year14	.019	.036	.240	1.870	-.010	-.024	-.144	1.870	.029	.085	.636	1.870	.046	.141	.840	1.870
Year15	.028	.042	.294	1.708	.034	.067	.423	1.708	-.006	-.015	-.115	1.708	.071	.176	1.095	1.708
Year16	-.088	-.143	-.941	1.918	-.040	-.085	-.504	1.918	-.048	-.122	-.898	1.918	.033	.089	.521	1.918
Year17	-.040	-.065	-.442	1.785	-.034	-.071	-.438	1.785	-.006	-.016	-.122	1.785	-.003	-.009	-.055	1.785
INDUS2	.076	.137	.994	1.578	.003	.007	.043	1.578	.073	.207	1.680	1.578	-.001	-.002	-.016	1.578
INDUS3	.302	.301	2.327*	1.386	.166	.215	1.502	1.386	.136	.213	1.841	1.386	.082	.136	.938	1.386
INDUS4	.190	.287	2.038*	1.637	.121	.237	1.518	1.637	.070	.165	1.310	1.637	.088	.218	1.387	1.637
INDUS5	.105	.151	1.128	1.491	.005	.010	.066	1.491	.100	.226	1.880	1.491	.032	.075	.502	1.491
INDUS6	.179	.246	1.877	1.416	.116	.206	1.423	1.416	.064	.137	1.170	1.416	.085	.192	1.313	1.416
INDUS7	-.284	-.283	-2.328*	1.226	-.056	-.073	-.542	1.226	-.228	-.357	-3.276**	1.226	-.091	-.150	-1.102	1.226
Adj. R ²			.142				-.053				.313				-.073	
F-statistic			1.734				.775				3.026**				.700	
Durbin-Watson			2.129				2.073				1.940				1.998	
Observations			72				72				72				72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

4.3.2.3 The Retention of Ownership and Earnings Management in the Post-IPO Year

In order to find an answer to the research question of whether post-IPO ownership structure impacts earnings management, the research hypotheses to investigate this impact were developed as follows:

Hypothesis 2.3: The retention of ownership concentration is negatively associated with earnings management in the post-IPO year.

Hypothesis 2.3a: The retention of ownership concentration is negatively associated with real earnings management in the post-IPO year.

Hypothesis 2.3b: The retention of ownership concentration is negatively associated with accrual-based earnings management in the post-IPO year.

Hypothesis 2.3c: The retention of managerial ownership is negatively associated with real earnings management in the post-IPO year.

Hypothesis 2.3d: The retention of managerial ownership is negatively associated with accrual-based earnings management in the post-IPO year.

The regression results of the retention of ownership and earnings management in the post-IPO year (year $t+1$) are presented in Table 4.19 Model 1 shows the association between the retention of ownership and real earnings management (REM), Model 2 shows the association between the retention of ownership and abnormal cash flow from operations (AbCFO), Model 3 shows the association between the retention of ownership and abnormal discretionary expenses (AbDEX), and Model 4 shows the association between the retention of ownership and accrual-based earnings management (AEM).

As shown in Table 4.19, there was no statistically significant association between the retention of ownership concentration (R_CONC) and either real earnings management (REM) or accrual-based earnings management (AEM). In addition, there was no significant association between the retention of managerial ownership (R_MANG) and either real earnings management (REM) or accrual-based earnings management (AEM).

Regarding the other variables, there was a statistically significant positive association between firm length of business operation (AGE) and real earnings management (REM) ($\beta=.353$, $p=.009$). When each activity of real earnings management (REM) was individually examined, no statistically significant association between firm length of business operation (AGE) and abnormal cash flow from operations (AbCFO) was found. However, there was a statistically significant positive association between firm length of business operation (AGE) and abnormal discretionary expenses (AbDEX) ($\beta=.255$, $p=.041$).

In conclusion, no significant association was found between the retention of ownership concentration, managerial ownership, and real and accrual-based earnings management in the post-IPO year. Therefore, hypotheses 2.3a, 2.3b, 2.3c and 2.3d are not supported.

However, there was a significantly positive association between firm length of business operation and abnormal discretionary expenses. This indicates that firms with longer operational histories are more likely to engage in upward earnings management by employing cost-cutting measures in discretionary expenses.

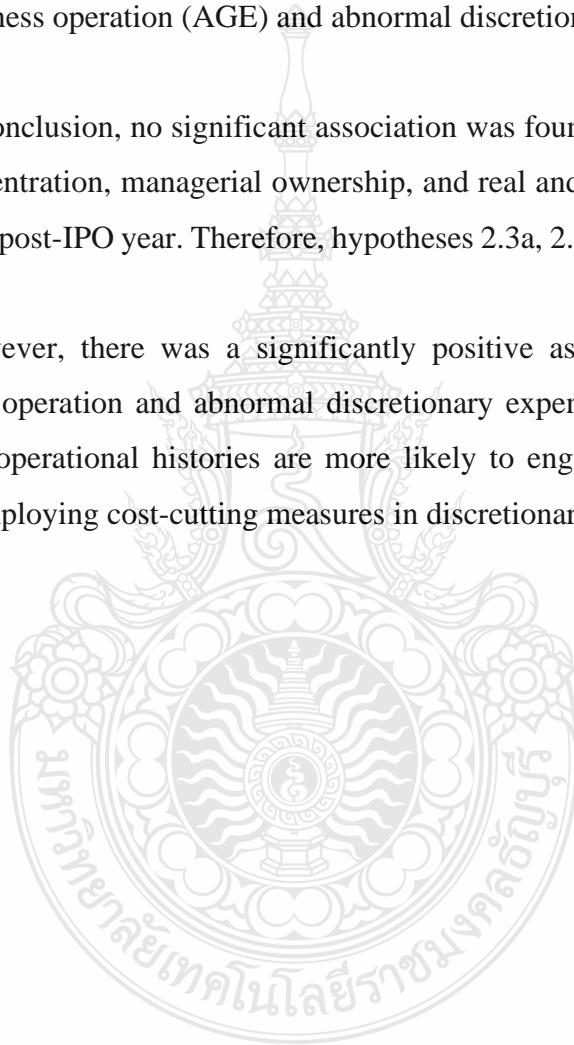


Table 4.19 The association between ownership retention and earnings management in post-IPO year (Year +1)

Independent Variables	Dependent Variables															
	Model 1: REM				Model 2: AbCFO				Model 3: AbDEX				Model 4: AEM			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	-.198		-2.427*		-.185		-2.375*		-.013		-.255		-.101		-1.632	
R_CONC	.001	.094	.813	1.145	.001	.082	.632	1.145	.000	.037	.345	1.145	.000	.053	.430	1.145
R_MANG	.000	-.021	-.169	1.338	.001	.112	.796	1.338	-.001	-.181	-1.543	1.338	.001	.176	1.313	1.338
GROWTH	-.003	-.019	-.153	1.340	.008	.052	.373	1.340	-.011	-.099	-.846	1.340	.020	.170	1.265	1.340
LEV	.036	.041	.340	1.246	.124	.166	1.224	1.246	-.088	-.156	-1.379	1.246	.008	.014	.105	1.246
AGE	.007	.353	2.729**	1.439	.004	.222	1.529	1.439	.003	.255	2.097*	1.439	.003	.255	1.829	1.439
Year13	-.008	-.016	-.120	1.537	.050	.122	.812	1.537	-.058	-.187	-1.487	1.537	-.017	-.050	-.346	1.537
Year14	.023	.058	.426	1.570	.017	.050	.328	1.570	.006	.024	.185	1.570	.005	.017	.115	1.570
Year16	-.040	-.091	-.673	1.587	-.037	-.098	-.643	1.587	-.003	-.012	-.095	1.587	-.065	-.211	-1.442	1.587
Year17	-.056	-.137	-.932	1.858	-.019	-.055	-.330	1.858	-.037	-.141	-1.022	1.858	-.067	-.236	-1.489	1.858
Year18	-.009	-.022	-.159	1.728	.017	.049	.307	1.728	-.026	-.100	-.750	1.728	.003	.010	.065	1.728
INDUS2	.061	.168	1.195	1.708	.017	.054	.342	1.708	.044	.191	1.438	1.708	.049	.192	1.265	1.708
INDUS3	.028	.042	.321	1.483	-.045	-.079	-.538	1.483	.073	.171	1.386	1.483	-.006	-.013	-.089	1.483
INDUS4	.057	.130	.970	1.535	-.005	-.014	-.095	1.535	.062	.221	1.758	1.535	.004	.013	.087	1.535
INDUS5	.182	.398	3.024**	1.490	.091	.235	1.587	1.490	.091	.309	2.495*	1.490	.125	.388	2.733**	1.490
INDUS6	.065	.135	1.035	1.462	.008	.020	.138	1.462	.057	.183	1.496	1.462	.066	.196	1.395	1.462
INDUS7	-.150	-.227	-1.879	1.254	-.015	-.026	-.194	1.254	-.135	-.318	-2.806**	1.254	.019	.040	.311	1.254
Adj. R ²			.174				-.044				.270				.042	
F-statistic			1.935*				.813				2.645**				1.193	
Durbin-Watson			2.073				2.021				1.619				2.311	
Observations			72				72				72				72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.20 presents a summary of the test results for the hypothesis that ownership structure is negatively associated with earnings management during the IPO period.

The results of the second hypothesis test reveal no significant association between ownership concentration and both real earnings management and accrual-based earnings management, spanning the periods before, during, and after the IPO. This indicates that the largest shareholder does not have a direct impact on earnings management during the IPO event. Concurrently, managerial ownership exhibits a negative association with real earnings management but no association with accrual-based earnings management in the year before the initial public offering (IPO). In the year of the IPO and thereafter, retaining the proportion of shares held by management owners shows no correlation with either real earnings management or accrual-based earnings management. This suggests that the influence of the original management owners diminishes after the IPO.

Table 4.20 Summary of the results of hypotheses 2 testing

	Hypothesis	Pre-IPO Year	IPO Year	Post-IPO Year
H2	Ownership structure is negatively associated with earnings management.			
H2.1	Ownership structure is negatively associated with earnings management in the pre-IPO year.			
H2.1a	Ownership concentration is negatively associated with real earnings management in the pre-IPO year.	Not Supported		
H2.1b	Ownership concentration is negatively associated with accrual-based earnings management in the pre-IPO year.	Not Supported		
H2.1c	Managerial ownership is negatively associated with real earnings management in the pre-IPO year.	Supported		
H2.1d	Managerial ownership is negatively associated with accrual-based earnings management in the pre-IPO year.	Not Supported		

Table 4.20 Summary of the results of hypotheses 2 testing (Cont.)

	Hypothesis	Pre-IPO Year	IPO Year	Post-IPO Year
H2.2	The retention of ownership structure is negatively associated with earnings management in the IPO year.			
H2.2a	The retention of ownership concentration is negatively associated with real earnings management in the IPO year.		Not Supported	
H2.2b	The retention of ownership concentration is negatively associated with accrual-based earnings management in the IPO year.		Not Supported	
H2.2c	The retention of managerial ownership is negatively associated with real earnings management in the IPO year.		Not Supported	
H2.2d	The retention of managerial ownership is negatively associated with accrual-based earnings management in the IPO year.		Not Supported	
H2.3	The retention of ownership structure is negatively associated with earnings management in the post-IPO year.			
H2.3a	The retention of ownership concentration is negatively associated with real earnings management in the post-IPO year.			Not Supported
H2.3b	The retention of ownership concentration is negatively associated with accrual-based earnings management in the post-IPO year.			Not Supported
H2.3c	The retention of managerial ownership is negatively associated with real earnings management in the post-IPO year.			Not Supported
H2.3d	The retention of managerial ownership is negatively associated with accrual-based management in the post-IPO year.			Not Supported

4.3.4 Empirical Results and Analysis of the Mediation Effect of Earnings Management on the Association between Ownership Structure and Firm Performance

4.3.4.1 The Mediation Effect in the Pre-IPO year

In order to find an answer to the research question of whether earnings management mediates the association between ownership structure and firm performance in the pre-IPO year, the research hypothesis to examine such an association was developed as follows:

Hypothesis 3.1: Earnings management mediates the association between ownership structure and firm performance in the pre-IPO year.

Hypothesis 3.1a: Real earnings management mediates the association between ownership concentration and return on assets in the pre-IPO year.

Hypothesis 3.1b: Real earnings management mediates the association between managerial ownership and return on assets in the pre-IPO year.

Hypothesis 3.1c: Real earnings management mediates the association between ownership concentration and return on equity in the pre-IPO year.

Hypothesis 3.1d: Real earnings management mediates the association between managerial ownership and return on equity in the pre-IPO year.

Hypothesis 3.1e: Accrual-based earnings management mediates the association between ownership concentration and return on assets in the pre-IPO year.

Hypothesis 3.1f: Accrual-based earnings management mediates the association between managerial ownership and return on assets in the pre-IPO year.

Hypothesis 3.1g: Accrual-based earnings management mediates the association between ownership concentration and return on equity in the pre-IPO year.

Hypothesis 3.1h: Accrual-based earnings management mediates the association between managerial ownership and return on equity in the pre-IPO year.

Table 4.21 presented a comparative examination of the effects of ownership structure and real earnings management on return on assets, focusing on evaluating the mediator in the pre-IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership structure (X) and return on assets (Y). The result indicated that there was no statistically significant association between ownership

concentration (CONC) and return on assets (ROA). However, the results revealed a significant and positive association between managerial ownership (MANG) and ROA ($\beta=.216$, $p=.040$).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership structure (X) and real earnings management (Med). According to the findings, the regression coefficient of ownership concentration (CONC) had no statistically significant effect on real earnings management (REM). However, the regression coefficient of managerial ownership (MANG) had a significant effect on REM ($\beta=-.293$, $p=.019$).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership structure (X), earnings management (Med), and return on assets (Y). When control ownership structure was used as a control variable, the result showed that the regression coefficient of real earnings management (REM), denoted as "b," had a statistically significant and negative effect on return on assets (ROA) ($\beta=-.364$, $p=.001$). Furthermore, when control real earnings management (REM) as a control variable, the regression coefficient of managerial ownership (MANG), denoted as "c," had no statistically significant effect on ROA.

Based on the analysis results from Step 1 to Step 3, it is evident that real earnings management (REM) does not serve as a mediator in the relationship between ownership concentration (CONC) and ROA. This is due to the absence of a correlation between ownership concentration (CONC) and ROA, as specified in Step 1. The findings suggest that real earnings management (REM) fully mediates the association between managerial ownership (MANG) and ROA. In other words, managerial ownership (MANG) has an indirect effect on the ROA through real earnings management while having no direct effect on the ROA. Therefore, hypothesis 3.1a is not supported, whereas hypothesis 3.1b is supported.

Table 4.21 The association between ownership structure, real earnings management, and return on assets in the pre-IPO year (Year-1)

Independent Variables	Model 1: ROA			Model 2: REM			Model 3: ROA			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	24.963		5.572**	-.213		-1.420	22.224		5.349**	
CONC	.017	.049	.525	.001	.085	.765	.027	.080	.933	1.164
MANG	.052	.216	.101*	-.002	-.293	-2.410*	.026	.109	1.110	1.516
GROWTH	.910	.126	12.236	-.064	-.313	-2.604*	.084	.012	.119	1.514
LEV	-24.587	-.544	-5.377**	.219	.171	1.431	-21.770	-.481	-5.133**	1.380
AGE	-.175	-.181	-1.732	.002	.075	.603	-.149	-.154	-1.611	1.436
REM							-12.854	-.364	-3.506**	1.692
Year11	-1.015	-.041	-.360	.099	.140	1.050	.261	.010	.100	1.690
Year12	1.330	.065	.520	.118	.204	1.382	2.850	.140	1.204	2.107
Year13	-2.399	-.130	-.992	.140	.267	1.728	-.600	-.032	-.265	2.342
Year14	-3.337	-.147	-1.250	.079	.123	.885	-2.320	-.102	-.947	1.821
Year15	3.609	.171	1.383	.005	.009	.059	3.676	.174	1.546	1.993
INDUS2	.029	.002	.014	-.006	-.011	-.085	-.048	-.003	-.025	1.635
INDUS3	-7.691	-.224	-2.109*	.350	.360	2.863**	-3.195	-.093	-.897	1.689
INDUS4	3.363	.148	1.365	.022	.034	.269	3.648	.161	1.625	1.530
INDUS5	-5.670	-.239	-2.213*	.112	.166	1.302	-4.233	-.178	-1.786	1.560
INDUS6	-2.744	-.110	-1.056	.085	.119	.972	-1.656	-.066	-.694	1.429
INDUS7	-5.624	-.164	-1.691	-.207	-.213	-1.859	-8.285	-.242	-2.653**	1.299
Adj. R ²			.454			.237			.547	
F-statistic			4.693**			2.379**			6.047**	
Durbin-Watson			2.054			2.114			1.971	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

CONC = ownership concentration; MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.22 The effects of managerial ownership on return on assets through real earnings management in the pre-IPO year (Year -1)

Effects	Path	Beta	SE	t	p-value
Direct effect	MANG -> ROA (Control REM)	.109	.024	1.110	.272
Indirect effect	MANG -> REM	-.293	.001	-2.410	.019*
	REM -> ROA	-.364	3.667	-3.506	.001**
Total effect	MANG > ROA	.216	.025	2.101	.040*

Note: *, ** Indicate .05, and .01 significance levels, respectively.

To confirm the significance of the indirect effect and mediating role of real earnings management, the Sobel Test (Sobel, 1982) was employed. The results, presented in Table 23, revealed a significant Sobel Test value of 1.986 ($p = .047$). This indicated that the indirect effects of the mediator variables are statistically significant. Thus, it can be concluded that real earnings management acts as a mediator between managerial ownership and ROA. In addition, Table 4.23 contains the values of the other two tests, the Aroian test and the Goodman test, which offer additional insight into the robustness of the mediation effects in the context of the research.

Table 4.23 Sobel, Aroian, and Goodman test statistics for mediation testing

Test	REM	
	Test Statistics	p-value
Sobel test	1.986	.047*
Aroian test	1.933	.053
Goodman test	2.043	.041*

Note: *, ** Indicate .05, and .01 significance levels, respectively.

Table 4.24 presented a comparative examination of the effects of ownership structure and real earnings management on return on equity, focusing on evaluating the mediator in the pre-IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership structure (X) and return on equity (Y). The result indicated that the regression coefficients of ownership concentration (CONC), denoted as “c,” had no statistically significant effect on return on equity (ROE). However, the regression coefficients of managerial ownership (MANG) had a significant and positive effect on return on equity (ROE) ($\beta=0.368$, $p=0.001$).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership structure (X) and real earnings management (Med). According to the results, the regression coefficient of ownership concentration (CONC), denoted as “a,” had no statistically significant effect on real earnings management (REM). However, the regression coefficient of managerial ownership (MANG) had a significant effect on REM ($\beta=-0.293$, $p=0.019$).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership structure (X), real earnings management (Med), and return on equity (Y). When control ownership structure as a control variables, the result showed that the regression coefficient of real earnings management (REM), denoted as "b," had a significant and negative association with ROE ($\beta=-0.344$, $p=0.002$). This implies that lower levels of real earnings management are linked to improved firm performance. Furthermore, when control real earnings management (REM) as a control variable, the regression coefficient of managerial ownership (MANG), denoted as “c,” had a significant and positive association with ROE ($\beta=0.267$, $p=0.012$).

Based on the analysis results from Step 1 to Step 3, it is evident that real earnings management (REM) does not act as a mediator in the relationship between ownership concentration (CONC) and ROE. This is due to the absence of a correlation between ownership concentration (CONC) and both ROE, as well as REM, as specified in Step 1 and Step 2. The findings suggest that real earnings management (REM) partially mediates the association between managerial ownership (MANG) and ROE. In other words, managerial ownership had an indirect effect on ROE through real earnings management and a direct effect on return on equity without real earnings management. Therefore, hypothesis 3.1c is not supported, whereas hypothesis 3.1d is supported.

Table 4.24 The association between ownership structure, real earnings management, and return on equity in the pre-IPO year (Year-1)

Independent Variables	Model 1: ROE			Model 2: REM			Model 2: ROE			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	35.203		3.730**	-.213		-1.420	29.877		3.358**	
CONC	.062	.090	.931	.001	.085	.765	.082	.119	1.327	1.164
MANG	.182	.368	3.496**	-.002	-.293	-2.410*	.132	.267	2.607*	1.516
GROWTH	.736	.050	.475	-.064	-.313	-2.604*	-.869	-.058	-.571	1.514
LEV	-23.793	-.256	-2.471*	.219	.171	1.431	-18.316	-.197	-2.016*	1.380
AGE	-.563	-.284	-2.646*	.002	.075	.603	-.512	-.258	-2.589*	1.436
REM							-24.991	-.344	-3.183**	1.692
Year11	.211	.004	.036	.099	.140	1.050	2.693	.052	.484	1.690
Year12	-.643	-.015	-.119	.118	.204	1.382	2.313	.055	.456	2.107
Year13	-4.579	-.120	-.899	.140	.267	1.728	-1.082	-.028	-.223	2.342
Year14	-8.639	-.185	-1.536	.079	.123	.885	-6.661	-.143	-1.270	1.821
Year15	6.747	.156	1.227	.005	.009	.059	6.876	.159	1.351	1.993
INDUS2	.618	.016	.138	-.006	-.011	-.085	.467	.012	.113	1.635
INDUS3	-22.221	-.315	-2.893**	.350	.360	2.863**	-13.479	-.191	-1.768	1.689
INDUS4	6.230	.133	1.201	.022	.034	.269	6.784	.145	1.411	1.530
INDUS5	-18.679	-.382	-3.460**	.112	.166	1.302	-15.885	-.325	-3.130**	1.560
INDUS6	-8.612	-.168	-1.573	.085	.119	.972	-6.497	-.126	-1.271	1.429
INDUS7	-11.306	-.160	-1.614	-.207	-.213	-1.859	-16.481	-.234	-2.464*	1.299
Adj. R ²			.427			.237			.508	
F-statistic			4.305**			2.379**			5.321**	
Durbin-Watson			2.203			2.114			2.122	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

CONC = ownership concentration; MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.25 The effects of managerial ownership on return on equity through real earnings management in the pre-IPO year (Year -1)

Effects	Path	Beta	SE	t	p-value
Direct effect	MANG -> ROE (Control REM)	.267	.051	2.607	.012*
Indirect effect	MANG -> REM	-.293	.001	-2.410	.019*
	REM -> ROE	-.344	7.852	-3.183	.002**
Total effect	MANG > ROE	.368	.052	3.496	.001**

Note: *, ** Indicate .05, and .01 significance levels, respectively.

To confirm the significance of the indirect effect and mediating role of real earnings management, Table 4.26 presents the results of the Sobel test value of 1.921 ($p = .054$), the Aroian test value of 1.863 ($p = .082$), and the Goodman test value of 1.984 ($p = .047$). The results support a significant indirect effect and the mediating role of earnings management. The Sobel and Aroian tests indicated moderate evidence at the .10 level, whereas the Goodman test indicated stronger significance at the .05 level. These results suggest that real earnings management plays a significant role as a mediator in the examined relationship, with increasing confidence in its impact indicated by the Goodman test.

Table 4.26 Sobel, Aroian, and Goodman test statistics for mediation testing

Test	REM	
	Test Statistics	p-value
Sobel test	1.921	.054
Aroian test	1.863	.082
Goodman test	1.984	.047*

Note: *, ** Indicate .05, and .01 significance levels, respectively.

Table 4.27 presented a comparative examination of the effects of ownership structure and accrual-based earnings management on return on assets, focusing on evaluating the mediator in the pre-IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership structure (X) and return on assets (Y). The result indicated that the regression coefficients of ownership concentration (CONC), denoted as “c,” had no statistically significant effect on return on assets (ROA). However, the regression coefficients of managerial ownership (MANG) had a statistically significant effect on return on assets (ROA) ($\beta = .216, p = .040$).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership structure (X) and accrual-based earnings management (Med). The result indicated that the regression coefficients of ownership concentration (CONC) and managerial ownership (MANG), denoted as “a,” had no statistically significant effect on accrual-based earnings management (AEM).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership structure (X), earnings management (Med), and return on assets (Y). When control ownership structure as a control variable. The result showed that the regression coefficient of accrual-based earnings management (AEM), denoted as “b,” had no statistically significant association with return on assets (ROA). As well as, in step 2, the regression coefficients of ownership structure, denoted as “a,” had no statistically significant association with accrual-based earnings management (AEM).

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that accrual-based earnings management (AEM) did not mediate the association between ownership concentration (CONC) and ROA, as well as between managerial ownership (MANG) and ROA. Therefore, hypotheses 3.1e and 3.1f are not supported.

Table 4.27 The association between ownership structure, accrual-based earnings management, and return on assets in the pre-IPO year (Year-1)

Independent Variables	Model 1: ROA			Model 2: AEM			Model 3: ROA			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	24.963		5.572**	.015		.121	25.061		5.634**	
CONC	.017	.049	.525	-.001	-.007	-.064	.016	.048	.517	1.152
MANG	.052	.216	2.101*	.000	-.083	-.695	.049	.203	1.982	1.383
GROWTH	.910	.126	1.236	-.054	-.308	-2.616*	.563	.078	.726	1.516
LEV	-24.587	-.544	-5.377**	.065	.060	.510	-24.166	-.535	-5.312**	1.337
AGE	-.175	-.181	-1.732	-.003	-.113	-.929	-.192	-.199	-1.899	1.449
AEM							-6.424	-.156	-1.346	1.763
Year11	-1.015	-.041	-.360	.215	.354	2.712**	.364	.015	.122	1.879
Year12	1.330	.065	.520	.083	.167	1.155	1.862	.091	.725	2.086
Year13	-2.399	-.130	-.992	.013	.029	.189	-2.317	-.125	-.965	2.223
Year14	-3.337	-.147	-1.250	.004	.007	.053	-3.312	-.146	-1.250	1.796
Year15	3.609	.171	1.383	.195	.382	2.663**	4.861	.231	1.766	2.250
INDUS2	.029	.002	.014	-.041	-.090	-.692	-.235	-.012	-.111	1.649
INDUS3	-7.691	-.224	-2.109*	.272	.327	2.659**	-5.943	-.173	-1.545	1.659
INDUS4	3.363	.148	1.365	.011	.019	.154	3.432	.151	1.403	1.529
INDUS5	-5.670	-.239	-2.213*	-.027	-.047	-.377	-5.844	-.246	-2.294**	1.517
INDUS6	-2.744	-.110	-1.056	-.043	-.071	-.586	-3.018	-.121	-1.166	1.414
INDUS7	-5.624	-.164	-1.691	.010	.012	.107	-5.560	-.162	-1.684	1.223
Adj. R ²			.454			.268			.462	
F-statistic			4.693**			2.624**			4.589**	
Durbin-Watson			2.054			1.863			2.028	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

CONC = ownership concentration; MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.28 presented a comparative examination of the effects of ownership structure and accrual-based earnings management on return on equity, focusing on evaluating the mediator in the pre-IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership structure (X) and return on equity (Y). The result indicated the regression coefficients of ownership concentration (CONC), denoted as “c,” had no statistically significant association with return on equity (ROE). However, the regression coefficients of managerial ownership (MANG) had a significant and positive association with return on equity (ROE) ($\beta=.368$, $p=.001$).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership structure (X) and accrual-based earnings management (Med). The result indicated that the regression coefficients of ownership concentration (CONC) and managerial ownership (MANG), denoted as “a,” had no statistically significant association with accrual-based earnings management (AEM).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership structure (X), earnings management (Med), and return on equity (Y). When control ownership structure as a control variable, the result indicated that the regression coefficient of accrual-based earnings management (AEM), denoted as “b,” had no statistically significant association with return on equity (ROE). As well as, in step 2, the regression coefficients of ownership structure, denoted as “a,” had no statistically significant association with accrual-based earnings management (AEM).

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that accrual-based earnings management (AEM) did not mediate the association between ownership concentration (CONC) and ROE, as well as between managerial ownership (MANG) and ROE. Therefore, hypotheses 3.1g and 3.1h are not supported.

Table 4.28 The association between ownership structure, accrual-based earnings management, and return on equity in the pre-IPO year (Year-1)

Independent Variables	Model 1: ROE			Model 2: AEM			Model 2: ROE			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	35.203		3.730**	.015		.121	35.384		3.762**	
CONC	.062	.090	.931	-.001	-.007	-.064	.061	.089	.925	1.152
MANG	.182	.368	3.496**	.000	-.083	-.695	.176	.356	3.383**	1.383
GROWTH	.736	.050	.475	-.054	-.308	-2.616*	.092	.006	.056	1.516
LEV	-23.793	-.256	-2.471*	.065	.060	.510	-23.013	-.248	-2.392*	1.337
AGE	-.563	-.284	-2.646*	-.003	-.113	-.929	-.594	-.300	-2.781**	1.449
AEM							-11.914	-.140	-1.181	1.763
Year11	.211	.004	.036	.215	.354	2.712**	2.769	.054	.439	1.879
Year12	-.643	-.015	-.119	.083	.167	1.155	.344	.008	.063	2.086
Year13	-4.579	-.120	-.899	.013	.029	.189	-4.427	-.116	-.872	2.223
Year14	-8.639	-.185	-1.536	.004	.007	.053	-8.592	-.184	-1.533	1.796
Year15	6.747	.156	1.227	.195	.382	2.663**	9.069	.209	1.558	2.250
INDUS2	.618	.016	.138	-.041	-.090	-.692	.128	.003	.029	1.649
INDUS3	-22.221	-.315	-2.893**	.272	.327	2.659**	-18.979	-.269	-2.334*	1.659
INDUS4	6.230	.133	1.201	.011	.019	.154	6.357	.136	1.229	1.529
INDUS5	-18.679	-.382	-3.460**	-.027	-.047	-.377	-19.002	-.389	-3.528**	1.517
INDUS6	-8.612	-.168	-1.573	-.043	-.071	-.586	-9.120	-.177	-1.667	1.414
INDUS7	-11.306	-.160	-1.614	.010	.012	.107	-11.187	-.159	-1.603	1.223
Adj. R ²			.427			.268			.431	
F-statistic			4.305**			2.624**			4.163**	
Durbin-Watson			2.203			1.863			2.191	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

CONC = ownership concentration; MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

4.3.4.2 The Mediation Effect in the IPO Year

In order to find an answer to the research question of whether earnings management mediates the association between ownership retention and firm performance in the IPO year, the research hypothesis to examine such an association was developed as follows:

Hypothesis 3.2: Earnings management mediates the association between the retention of ownership and firm performance in the IPO year.

Hypothesis 3.2a: Real earnings management mediates the association between the retention of ownership concentration and return on assets in the IPO year.

Hypothesis 3.2b: Real earnings management mediates the association between the retention of managerial ownership and return on assets in the IPO year.

Hypothesis 3.2c: Real earnings management mediates the association between the retention of ownership concentration and return on equity in the IPO year.

Hypothesis 3.2d: Real earnings management mediates the association between the retention of managerial ownership and return on equity in the IPO year.

Hypothesis 3.2e: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on assets in the IPO year.

Hypothesis 3.2f: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on assets in the IPO year.

Hypothesis 3.1g: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on equity in the IPO year.

Hypothesis 3.2h: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on equity in the IPO year.

Table 4.29 presented a comparative examination of the effects of ownership retention and real earnings management on return on assets, focusing on evaluating the mediator in the IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership retention (X) and return on assets (Y). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “c,” had no statistically significant association with return on assets (ROA).

Model 2 shows the multiple regression results for Step 2, focusing on examining the association between ownership retention (X) and real earnings management (Med). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “a,” had no statistically significant association with real earnings management (REM).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership retention (X), earnings management (Med), and ROA (Y). The result indicated that the regression coefficient of real earnings management (REM), denoted as “b,” had a significant and negative association with return on assets (ROA) ($\beta = -.289$, $p = .019$) when controlling for ownership retention as a control variable. This implies that lower levels of real earnings management are linked to improved firm performance.

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that real earnings management (REM) did not mediate the association between ownership concentration (CONC) and ROA, as well as between managerial ownership (MANG) and ROA. Therefore, hypotheses 3.2a and 3.2b are not supported.

Table 4.29 The association between ownership retention, real earnings management, and return on assets in the IPO year (Year 0)

Independent Variables	Model 1: ROA			Model 2: REM			Model 2: ROA			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	10.088		3.560**	-.066		-.468	9.674		3.553**	1.164
R_CONC	-.013	-.043	-.392	.000	-.013	-.106	-.014	-.047	-.443	1.445
R_MANG	.044	.217	1.833	-.002	-.252	-1.971	.030	.144	1.228	1.347
GROWTH	2.324	.458	3.881**	-.010	-.045	-.350	2.258	.445	3.929**	1.161
LEV	-11.128	-.344	-3.156**	.157	.105	.889	-10.151	-.313	-2.981**	1.467
AGE	.107	.176	1.432	.003	.106	.800	.126	.206	1.744	1.504
REM							-6.240	-.289	-2.412*	1.685
Year12	.945	.060	.453	-.030	-.041	-.290	.757	.048	.378	1.872
Year14	-1.149	-.098	-.707	.019	.036	.240	-1.028	-.088	-.659	1.711
Year15	-3.276	-.228	-1.717	.028	.042	.294	-3.101	-.216	-1.693	1.949
Year16	-.100	-.008	-.053	-.088	-.143	-.941	-.651	-.049	-.359	1.791
Year17	-2.355	-.177	-1.301	-.040	-.065	-.442	-2.604	-.196	-1.498	1.607
INDUS2	1.325	.111	.869	.076	.137	.994	1.798	.151	1.218	1.522
INDUS3	-1.270	-.059	-.490	.302	.301	2.327*	.613	.028	.235	1.761
INDUS4	.237	.017	.127	.190	.287	2.038*	1.424	.099	.767	1.525
INDUS5	1.345	.090	.721	.105	.151	1.128	2.001	.133	1.106	1.506
INDUS6	.090	.006	.047	.179	.246	1.877	1.209	.077	.639	1.347
INDUS7	2.776	.128	1.137	-.284	-.283	-2.328*	1.003	.046	.409	1.164
Adj. R ²			.265			.142			.324	
F-statistic			2.597**			1.734			3.001**	
Durbin-Watson			2.008			2.129			1.877	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.30 presented a comparative examination of the effects of ownership retention and real earnings management on return on equity, focusing on evaluating the mediator in the IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership retention (X) and return on equity (Y). The result indicated that the regression coefficients of ownership concentration retention (R_CONC), denoted as “c,” had no significant association with return on equity (ROE). However, the regression coefficients of managerial ownership retention (R_MANG) had a significant and positive association with ROE ($\beta = .271$, $p = .018$).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership retention (X) and real earnings management (Med). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “a,” had no statistically significant effect on real earnings management (REM).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership retention (X), earnings management (Med), and ROE (Y). The result indicated that the regression coefficient of real earnings management (REM), denoted as “b,” had a significant and negative association with ROE ($\beta = -.313$, $p = .007$) when controlling for ownership retention as a control variable. This implies that lower levels of real earnings management are linked to improved firm performance.

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that real earnings management (REM) did not mediate the association between ownership concentration (CONC) and ROE, as well as between managerial ownership (MANG) and ROE. Therefore, hypotheses 3.2c and 3.2d are not supported.

Table 4.30 The association between ownership retention, real earnings management, and return on equity in the IPO year (Year 0)

Independent Variables	Model 1: ROE			Model 2: REM			Model 2: ROE			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	8.408		1.794	-.066		-.468	7.620		1.723	
R_CONC	.024	.046	.442	.000	-.013	-.106	.022	.042	.429	1.164
R_MANG	.097	.271	2.432*	-.002	-.252	-1.971	.069	.192	1.769	1.445
GROWTH	5.132	.576	5.182**	-.010	-.045	-.350	5.007	.562	5.363**	1.347
LEV	-7.587	-.133	-1.301	.157	.105	.889	-5.724	-.101	-1.035	1.161
AGE	.185	.173	1.501	.003	.106	.800	.221	.206	1.888	1.467
REM							-11.889	-.313	-2.830**	1.504
Year12	3.570	.129	1.036	-.030	-.041	-.290	3.211	.116	.989	1.685
Year14	-2.843	-.139	-1.057	.019	.036	.240	-2.611	-.127	-1.031	1.872
Year15	-5.903	-.234	-1.871	.028	.042	.294	-5.569	-.221	-1.873	1.711
Year16	-3.150	-.135	-1.015	-.088	-.143	-.941	-4.199	-.180	-1.425	1.949
Year17	-2.491	-.107	-.832	-.040	-.065	-.442	-2.966	-.127	-1.050	1.791
INDUS2	3.650	.174	1.447	.076	.137	.994	4.552	.217	1.898	1.607
INDUS3	-2.377	-.062	-.554	.302	.301	2.327*	1.212	.032	.286	1.522
INDUS4	-.089	-.004	-.029	.190	.287	2.038*	2.174	.086	.720	1.761
INDUS5	3.467	.132	1.125	.105	.151	1.128	4.716	.179	1.606	1.525
INDUS6	.777	.028	.246	.179	.246	1.877	2.910	.105	.948	1.506
INDUS7	2.772	.073	.687	-.284	-.283	-2.328*	-.605	-.016	-.152	1.347
Adj. R ²			.348			.142			.422	
F-statistic			3.368**			1.734			4.045**	
Durbin-Watson			2.030			2.129			1.802	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.31 presented a comparative examination of the effects of ownership retention and accrual-based earnings management on return on assets, focusing on evaluating the mediator in the IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership retention (X) and return on assets (Y). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “c,” had no significant association with return on assets (ROA).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership retention (X) and accrual-based earnings management (Med). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “a,” had no significant association with accrual-based earnings management (AEM).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership retention (X), earnings management (Med), and return on assets (Y). When control ownership retention was used as a control variable, the result showed that the regression coefficient of accrual-based earnings management (AEM), denoted as “b,” had no significant association with return on assets (ROA).

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that accrual-based earnings management (AEM) did not mediate the association between ownership concentration (CONC) and ROA, as well as between managerial ownership (MANG) and ROA. Therefore, hypotheses 3.2e and 3.2f are not supported.

Table 4.31 The association between ownership retention, accrual-based earnings management, and return on assets in the IPO year (Year 0)

Independent Variables	Model 1: ROA			Model 2: AEM			Model 2: ROA			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	10.088		3.560**	-.020		-.204	10.037		3.522**	
R_CONC	-.013	-.043	-.392	.000	-.019	-.141	-.013	-.044	-.402	1.164
R_MANG	.044	.217	1.833	.000	-.050	-.353	.044	.213	1.791	1.353
GROWTH	2.324	.458	3.881**	-.015	-.105	-.734	2.285	.450	3.777**	1.358
LEV	-11.128	-.344	-3.156**	.121	.133	1.013	-10.814	-.334	-3.023**	1.166
AGE	.107	.176	1.432	-.001	-.055	-.371	.104	.172	1.391	1.454
AEM							-2.601	-.073	-.650	1.204
Year12	.945	.060	.453	.090	.203	1.276	1.179	.075	.555	1.733
Year14	-1.149	-.098	-.707	.046	.141	.840	-1.029	-.088	-.626	1.894
Year15	-3.276	-.228	-1.717	.071	.176	1.095	-3.092	-.216	-1.595	1.746
Year16	-.100	-.008	-.053	.033	.089	.521	-.014	-.001	-.008	1.927
Year17	-2.355	-.177	-1.301	-.003	-.009	-.055	-2.364	-.178	-1.299	1.785
INDUS2	1.325	.111	.869	-.001	-.002	-.016	1.323	.111	.863	1.578
INDUS3	-1.270	-.059	-.490	.082	.136	.938	-1.056	-.049	-.402	1.408
INDUS4	.237	.017	.127	.088	.218	1.387	.465	.032	.243	1.694
INDUS5	1.345	.090	.721	.032	.075	.502	1.427	.095	.760	1.498
INDUS6	.090	.006	.047	.085	.192	1.313	.311	.020	.159	1.460
INDUS7	2.776	.128	1.137	-.091	-.150	-1.102	2.539	.117	1.024	1.253
Adj. R ²			.265			-.073			.257	
F-statistic			2.597**			.700			2.443**	
Durbin-Watson			2.008			1.998			1.964	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.32 presented a comparative examination of the effects of ownership retention and accrual-based earnings management on return on equity, focusing on evaluating the mediator in the IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership retention (X) and return on equity (Y). The result indicated that the regression coefficients of ownership concentration retention (R_CONC), denoted as "c," had no significant association with return on equity (ROE). However, the regression coefficients of managerial ownership retention (R_MANG) had a significant association with ROE ($\beta = .271$, $p = .018$).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership retention (X) and accrual-based earnings management (Med). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as "a," had no significant association with accrual-based earnings management (AEM).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership structure (X), earnings management (Med), and ROE (Y). When control ownership retention was used as a control variable, the result showed that the regression coefficient of accrual-based earnings management (AEM), denoted as "b," had no significant association with return on equity (ROE).

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that accrual-based earnings management (AEM) did not mediate the association between ownership concentration (CONC) and ROE, as well as between managerial ownership (MANG) and ROE. Therefore, hypotheses 3.2g and 3.2h are not supported.

Table 4.32 The association between ownership retention, accrual-based earnings management, and return on equity in the IPO year (Year 0)

Independent Variables	Model 1: ROE			Model 2: AEM			Model 2: ROE			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	8.408		1.794	-.020		-.204	8.273		1.766	
R_CONC	.024	.046	.442	.000	-.019	-.141	.023	.044	.423	1.164
R_MANG	.097	.271	2.432*	.000	-.050	-.353	.095	.265	2.382*	1.353
GROWTH	5.132	.576	5.182**	-.015	-.105	-.734	5.029	.564	5.058**	1.358
LEV	-7.587	-.133	-1.301	.121	.133	1.013	-6.750	-.119	-1.148	1.166
AGE	.185	.173	1.501	-.001	-.055	-.371	.179	.167	1.448	1.454
AEM							-6.924	-.111	-1.052	1.204
Year12	3.570	.129	1.036	.090	.203	1.276	4.193	.151	1.200	1.733
Year14	-2.843	-.139	-1.057	.046	.141	.840	-2.523	-.123	-.933	1.894
Year15	-5.903	-.234	-1.871	.071	.176	1.095	-5.413	-.215	-1.699	1.746
Year16	-3.150	-.135	-1.015	.033	.089	.521	-2.920	-.125	-.940	1.927
Year17	-2.491	-.107	-.832	-.003	-.009	-.055	-2.514	-.108	-.841	1.785
INDUS2	3.650	.174	1.447	-.001	-.002	-.016	3.645	.174	1.446	1.578
INDUS3	-2.377	-.062	-.554	.082	.136	.938	-1.806	-.047	-.418	1.408
INDUS4	-.089	-.004	-.029	.088	.218	1.387	.518	.021	.165	1.694
INDUS5	3.467	.132	1.125	.032	.075	.502	3.686	.140	1.194	1.498
INDUS6	.777	.028	.246	.085	.192	1.313	1.366	.049	.426	1.460
INDUS7	2.772	.073	.687	-.091	-.150	-1.102	2.142	.056	.525	1.253
Adj. R ²			.348			-.073			.349	
F-statistic			3.368**			.700			3.241**	
Durbin-Watson			2.030			1.998			1.947	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

4.3.4.2 The Mediation Effect in the Post-IPO Year

In order to find an answer to the research question of whether earnings management mediates the association between ownership retention and firm performance in the post-IPO year, the research hypothesis to examine such an association was developed as follows:

Hypothesis 3.3: Earnings management mediates the association between the retention of ownership and firm performance in the pre-IPO year.

Hypothesis 3.3a: Real earnings management mediates the association between the retention of ownership concentration and return on assets in the post-IPO year.

Hypothesis 3.3b: Real earnings management mediates the association between the retention of managerial ownership and return on assets in the post-IPO year.

Hypothesis 3.3c: Real earnings management mediates the association between the retention of ownership concentration and return on equity in the post-IPO year.

Hypothesis 3.3d: Real earnings management mediates the association between the retention of managerial ownership and return on equity in the post-IPO year.

Hypothesis 3.3e: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on assets in the post-IPO year.

Hypothesis 3.3f: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on assets in the post-IPO year.

Hypothesis 3.3g: Accrual-based earnings management mediates the association between the retention of ownership concentration and return on equity in the post-IPO year.

Hypothesis 3.3h: Accrual-based earnings management mediates the association between the retention of managerial ownership and return on equity in the post-IPO year.

Table 4.31 presented a comparative examination of the effects of ownership retention and real earnings management on return on assets, focusing on evaluating the mediator in the post-IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership retention (X) and return on assets (Y). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “c,” had no statistically significant effect on return on assets (ROA).

Model 2 shows the multiple regression results for Step 2, focusing on examining the association between ownership retention (X) and real earnings management (Med). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “a,” had no statistically significant effect on real earnings management (REM).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership retention (X), earnings management (Med), and ROA (Y). When control ownership retention was used as a control variable, the result indicated that the regression coefficient of real earnings management (REM), denoted as “b,” had a statistically significant and negative effect on ROA ($\beta = -.492$, $p = .000$).

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that real earnings management (REM) did not mediate the association between ownership concentration retention (R_CONC) and ROA, as well as between managerial ownership retention (R_MANG) and ROA. Therefore, hypotheses 3.3a and 3.3b are not supported.

Table 4.33 The association between ownership retention, real earnings management, and return on assets in the post-IPO year (Year+1)

Independent Variables	Model 1: ROA			Model 2: REM			Model 2: ROA			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	8.480		2.268*	-.198		-2.427*	4.261		1.212	
R_CONC	-.033	-.082	-.671	.001	.094	.813	-.014	-.036	-.326	1.159
R_MANG	.025	.091	.687	.000	-.021	-.169	.022	.080	.681	1.339
GROWTH	3.381	.463	3.503**	-.003	-.019	-.153	3.312	.454	3.839**	1.340
LEV	-10.001	-.264	-2.067*	.036	.041	.340	-9.237	-.243	-2.134*	1.249
AGE	.041	.051	.374	.007	.353	2.729**	.181	.225	1.725	1.634
REM							-21.309	-.492	-3.857**	1.563
Year13	1.483	.071	.503	-.008	-.016	-.120	1.319	.063	.500	1.538
Year14	2.101	.123	.862	.023	.058	.426	2.583	.152	1.184	1.575
Year16	1.336	.071	.490	-.040	-.091	-.673	.484	.026	.198	1.600
Year17	-.046	-.003	-.017	-.056	-.137	-.932	-1.231	-.070	-.500	1.888
Year18	-1.326	-.075	-.502	-.009	-.022	-.159	-1.520	-.087	-.645	1.729
INDUS2	.630	.040	.268	.061	.168	1.195	1.936	.123	.909	1.752
INDUS3	1.318	.046	.331	.028	.042	.321	1.911	.067	.537	1.486
INDUS4	1.389	.073	.518	.057	.130	.970	2.597	.137	1.075	1.561
INDUS5	1.542	.078	.558	.182	.398	3.024**	5.423	.274	2.035*	1.738
INDUS6	3.216	.154	1.117	.065	.135	1.035	4.600	.221	1.771	1.490
INDUS7	3.341	.117	.914	-.150	-.227	-1.879	.149	.005	.044	1.334
Adj. R ²			.073			.174			.260	
F-statistic			1.352			1.935*			2.468**	
Durbin-Watson			2.158			2.073			1.945	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.34 presented a comparative examination of the effects of ownership retention and real earnings management on return on equity, specifically focusing on evaluating the mediator in the IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership retention (X) and return on equity (Y). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “c,” had no statistically significant effect on return on equity (ROE).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership retention (X) and real earnings management (Med). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “a,” had no statistically significant effect on real earnings management (REM).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership retention (X), earnings management (Med), and ROE (Y). When control ownership retention was used as a control variable, the result indicated that the regression coefficient of real earnings management (REM), denoted as “b,” had a statistically significant and negative effect on ROE ($\beta = -.508$, $p = .000$).

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that real earnings management (REM) did not mediate the association between ownership concentration retention (R_CONC) and ROE, as well as between managerial ownership retention (R_MANG) and ROE. Therefore, hypotheses 3.3c and 3.3d are not supported.

Table 4.34 The association between ownership retention, real earnings management, and return on equity in the post-IPO year (Year+1)

Independent Variables	Model 1: ROE			Model 2: REM			Model 2: ROE			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	7.469		1.182	-.198		-2.427*	.242		.041	
R_CONC	-.038	-.057	-.457	.001	.094	.813	-.006	-.009	-.083	1.159
R_MANG	.060	.132	.982	.000	-.021	-.169	.055	.121	1.014	1.339
GROWTH	5.588	.461	3.426**	-.003	-.019	-.153	5.470	.451	3.766**	1.340
LEV	-8.262	-.131	-1.010	.036	.041	.340	-6.954	-.110	-.954	1.249
AGE	.057	.043	.309	.007	.353	2.729**	.297	.222	1.681	1.634
REM							-36.503	-.508	-3.925**	1.563
Year13	3.055	.088	.613	-.008	-.016	-.120	2.773	.080	.624	1.538
Year14	3.895	.138	.946	.023	.058	.426	4.722	.167	1.286	1.575
Year16	2.144	.068	.466	-.040	-.091	-.673	.684	.022	.166	1.600
Year17	-1.482	-.051	-.321	-.056	-.137	-.932	-3.513	-.120	-.847	1.888
Year18	-1.896	-.065	-.425	-.009	-.022	-.159	-2.229	-.076	-.561	1.729
INDUS2	1.998	.076	.503	.061	.168	1.195	4.234	.162	1.182	1.752
INDUS3	4.151	.087	.618	.028	.042	.321	5.168	.109	.863	1.486
INDUS4	1.906	.061	.421	.057	.130	.970	3.974	.126	.977	1.561
INDUS5	3.397	.103	.728	.182	.398	3.024**	10.045	.305	2.239*	1.738
INDUS6	6.479	.187	1.332	.065	.135	1.035	8.851	.256	2.025*	1.490
INDUS7	4.900	.103	.793	-.150	-.227	-1.879	-.568	-.012	-.100	1.334
Adj. R ²			.041			.174			.240	
F-statistic			1.191			1.935*			2.320*	
Durbin-Watson			2.160			2.073			1.936	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.35 presented a comparative examination of the effects of ownership retention and accrual-based earnings management on return on assets (ROA), focusing on evaluating the mediator in the IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership retention (X) and return on assets (Y). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “c,” had no statistically significant effect on return on assets (ROA).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership retention (X) and accrual-based earnings management (Med). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “a,” had no statistically significant effect on accrual-based earnings management (AEM).

Lastly, in Model 3 shows the multiple regression results for Step 3, which examined the association between ownership structure (X), earnings management (Med), and return on assets (Y). These results did not align with the criteria developed by Baron and Kenny (1986) for mediation. When control ownership retention was used as a control variable, the result indicated that the regression coefficient of accrual-based earnings management (AEM), denoted as “b,” had no statistically significant effect on return on assets (ROA).

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that accrual-based earnings management (AEM) did not mediate the association between ownership concentration retention (R_CONC) and ROA, as well as between managerial ownership retention (R_MANG) and ROA. Therefore, hypotheses 3.3e and 3.3f are not supported.

Table 4.35 The association between ownership retention, accrual-based earnings management, and return on assets in the post-IPO year (year+1)

Independent Variables	Model 1: ROA			Model 2: AEM			Model 2: ROA			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	8.480		2.268*	-.101		-1.632	8.028		2.083	
R_CONC	-.033	-.082	-.671	.000	.053	.430	-.031	-.078	-.634	1.149
R_MANG	.025	.091	.687	.001	.176	1.313	.028	.104	.767	1.380
GROWTH	3.381	.463	3.503**	.020	.170	1.265	3.472	.476	3.523	1.379
LEV	-10.001	-.264	-2.067*	.008	.014	.105	-9.963	-.263	-2.046	1.247
AGE	.041	.051	.374	.003	.255	1.829	.056	.070	.492	1.526
AEM							-4.482	-.073	-.546	1.347
Year13	1.483	.071	.503	-.017	-.050	-.346	1.408	.068	.473	1.541
Year14	2.101	.123	.862	.005	.017	.115	2.121	.125	.865	1.570
Year16	1.336	.071	.490	-.065	-.211	-1.442	1.045	.055	.374	1.647
Year17	-.046	-.003	-.017	-.067	-.236	-1.489	-.348	-.020	-.124	1.933
Year18	-1.326	-.075	-.502	.003	.010	.065	-1.313	-.075	-.494	1.728
INDUS2	.630	.040	.268	.049	.192	1.265	.850	.054	.354	1.757
INDUS3	1.318	.046	.331	-.006	-.013	-.089	1.291	.045	.323	1.484
INDUS4	1.389	.073	.518	.004	.013	.087	1.407	.074	.521	1.535
INDUS5	1.542	.078	.558	.125	.388	2.733**	2.101	.106	.709	1.693
INDUS6	3.216	.154	1.117	.066	.196	1.395	3.513	.169	1.192	1.514
INDUS7	3.341	.117	.914	.019	.040	.311	3.425	.120	.930	1.256
Adj. R ²			.073			.042			.062	
F-statistic			1.352			1.193			1.274	
Durbin-Watson			2.158			2.311			2.135	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.36 presented a comparative examination of the effects of ownership retention and accrual-based earnings management on return on equity, specifically focusing on evaluating the mediator in the IPO year.

Model 1 shows the multiple regression results for Step 1, which examined the association between ownership retention (X) and return on equity (Y). The result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “c,” had no statistically significant effect on return on equity (ROE).

Model 2 shows the multiple regression results for Step 2, which examined the association between ownership retention (X) and accrual-based earnings management (Med). According to the results, the result indicated that the regression coefficients of ownership concentration retention (R_CONC) and managerial ownership retention (R_MANG), denoted as “a,” had no statistically significant effect on accrual-based earnings management (AEM).

Lastly, Model 3 shows the multiple regression results for Step 3, which examined the association between ownership structure (X), earnings management (Med), and ROE (Y). When control ownership structure as a control variable, the regression coefficient of accrual-based earnings management (AEM), denoted as “b,” had no statistically significant effect on ROE.

Based on the analysis results from Step 1 to Step 3, it is evident that these results do not align with the criteria developed by Baron and Kenny (1986) for mediation. As a result, it can be concluded that accrual-based earnings management (AEM) did not mediate the association between ownership concentration retention (R_CONC) and ROE, as well as between managerial ownership retention (R_MANG) and ROE. Therefore, hypotheses 3.3g and 3.3h are not supported.

Table 4.36 The association between ownership retention, accrual-based earnings management, and return on equity in the post-IPO year (Year+1)

Independent Variables	Model 1: ROE			Model 2: AEM			Model 2: ROE			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	7.469		1.182	-.101		-1.632	6.515		1.002	
R_CONC	-.038	-.057	-.457	.000	.053	.430	-.034	-.052	-.414	1.149
R_MANG	.060	.132	.982	.001	.176	1.313	.067	.148	1.082	1.380
GROWTH	5.588	.461	3.426**	.020	.170	1.265	5.778	.477	3.475**	1.379
LEV	-8.262	-.131	-1.010	.008	.014	.105	-8.183	-.130	-.996	1.247
AGE	.057	.043	.309	.003	.255	1.829	.089	.067	.462	1.526
AEM							-9.461	-.093	-.683	1.347
Year13	3.055	.088	.613	-.017	-.050	-.346	2.895	.084	.577	1.541
Year14	3.895	.138	.946	.005	.017	.115	3.939	.139	.952	1.570
Year16	2.144	.068	.466	-.065	-.211	-1.442	1.530	.049	.325	1.647
Year17	-1.482	-.051	-.321	-.067	-.236	-1.489	-2.119	-.073	-.447	1.933
Year18	-1.896	-.065	-.425	.003	.010	.065	-1.869	-.064	-.417	1.728
INDUS2	1.998	.076	.503	.049	.192	1.265	2.463	.094	.608	1.757
INDUS3	4.151	.087	.618	-.006	-.013	-.089	4.096	.086	.606	1.484
INDUS4	1.906	.061	.421	.004	.013	.087	1.942	.062	.427	1.535
INDUS5	3.397	.103	.728	.125	.388	2.733**	4.577	.139	.916	1.693
INDUS6	6.479	.187	1.332	.066	.196	1.395	7.107	.205	1.429	1.514
INDUS7	4.900	.103	.793	.019	.040	.311	5.078	.107	.817	1.256
Adj. R ²			.041			.042			.264	
F-statistic			1.191			1.193			1.137	
Durbin-Watson			2.160			2.311			2.133	
Observations			72			72			72	

Note: *, ** Indicate .05, and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if service group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table 4.37 presents a summary of the test results for the hypotheses that earnings management mediates the association between ownership structure and firm performance during the IPO period.

The results of hypotheses 3 indicate that ownership concentration does not direct effect on earnings management and firm performance during the IPO period. However, the analysis demonstrates that in the pre-IPO year, higher managerial ownership is associated with reduced REM behavior and improved firm performance. The mediation analysis provides additional insights, showing that REM fully mediates the relationship between managerial ownership and ROA, while partially mediating the relationship between managerial ownership and ROE. However, after the IPO, the retention of managerial ownership does not show a significant relationship between earnings management and firm performance. REM no longer serves as a mediating variable. These findings illuminate changes in ownership structure during the transition from private to public companies. The decline in managerial ownership following the IPO clearly highlights the potential loss of control and influence, which impacts the practices of earnings management and operational efficiency.

Table 4.37 Summary of the results of hypotheses 3 testing

	Hypothesis	Pre-IPO Year	IPO Year	Post-IPO Year
H3	Earnings management mediates the association between ownership structure and firm performance.			
H3.1	Earnings management mediates the association between ownership structure and firm performance in the pre-IPO year.			
H3.1a	Real earnings management mediates the association between ownership concentration and return on assets in the pre-IPO year.	Not Supported		
H3.1b	Real earnings management mediates the association between managerial ownership and return on assets in the pre-IPO year.	Supported		
H3.1c	Real earnings management mediates the association between ownership concentration and return on equity in the pre-IPO year.	Not Supported		

Table 4.37 Summary of the results of hypotheses 3 testing (Cont.)

	Hypothesis	Pre-IPO Year	IPO Year	Post-IPO Year
H3.1d	Real earnings management mediates the association between managerial ownership and return on equity in the pre-IPO year.	Supported		
H3.1e	Accrual-based earnings management mediates the association between ownership concentration and return on assets in the pre-IPO year.	Not Supported		
H3.1f	Accrual-based earnings management mediates the association between managerial ownership and return on assets in the pre-IPO year.	Not Supported		
H3.1g	Accrual-based earnings management mediates the association between ownership concentration and return on equity in the pre-IPO year.	Not Supported		
H3.1h	Accrual-based earnings management mediates the association between managerial ownership and return on equity in the pre-IPO year.	Not Supported		
H3.2	Earnings management mediates the association between ownership structure and firm performance in the IPO year.			
H3.2a	Real earnings management mediates the association between the retention of ownership concentration and return on assets in the IPO year.		Not Supported	
H3.2b	Real earnings management mediates the association between the retention of managerial ownership and return on assets in the IPO year.		Not Supported	

Table 4.37 Summary of the results of hypotheses 3 testing (Cont.)

	Hypothesis	Pre-IPO Year	IPO Year	Post-IPO Year
H3.2c	Real earnings management mediates the association between the retention of ownership concentration and return on equity in the IPO year.		Not Supported	
H3.2d	Real earnings management mediates the association between the retention of managerial ownership and return on equity in the IPO year.		Not Supported	
H3.2e	Accrual-based earnings management mediates the association between the retention of ownership concentration and return on assets in the IPO year.		Not Supported	
H3.2f	Accrual-based earnings management mediates the association between the retention of managerial ownership and return on assets in the IPO year.		Not Supported	
H3.2g	Accrual-based earnings management mediates the association between the retention of ownership concentration and return on equity in the IPO year.		Not Supported	
H3.2h	Accrual-based earnings management mediates the association between the retention of managerial ownership and return on equity in the IPO year.		Not Supported	
H3.3	Earnings management mediates the association between ownership structure and firm performance in the post-IPO year.			
H3.3a	Real earnings management mediates the association between the retention of ownership concentration and return on assets in the post-IPO year.			Not Supported

Table 4.37 Summary of the results of hypotheses 3 testing (Cont.)

	Hypothesis	Pre-IPO Year	IPO Year	Post-IPO Year
H3.3b	Real earnings management mediates the association between the retention of managerial ownership and return on assets in the post-IPO year.			Not Supported
H3.3c	Real earnings management mediates the association between the retention of ownership concentration and return on equity in the post-IPO year.			Not Supported
H3.3d	Real earnings management mediates the association between the retention of managerial ownership and return on equity in the post-IPO year.			Not Supported
H3.3e	Accrual-based earnings management mediates the association between the retention of ownership concentration and return on assets in the post-IPO year.			Not Supported
H3.3f	Accrual-based earnings management mediates the association between the retention of managerial ownership and return on assets in the post-IPO year.			Not Supported
H3.3g	Accrual-based earnings management mediates the association between the retention of ownership concentration and return on equity in the post-IPO year.			Not Supported
H3.3h	Accrual-based earnings management mediates the association between the retention of managerial ownership and return on equity in the post-IPO year.			Not Supported

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to contribute to the existing academic literature by conducting a comprehensive examination of the effects of ownership structure on firms' performance. The study investigates both the direct effect of ownership structure and the indirect effects of earnings management during the initial public offering (IPO) period. By incorporating earnings management variables as mediators, this comprehensive review seeks to clarify the complex relationship between ownership structure and business performance. The in-depth findings of this study are relevant not only for SMEs looking to go public but also for a wide range of stakeholders, including policymakers, investors, and market participants. Understanding the intricate relationship between ownership structure and firm performance is essential for making informed decisions and evaluations in the dynamic financial environment.

The population of this study consisted of IPO companies listed on the Market for Alternative Investment from 2012 to 2017. However, companies in the finance industry were excluded because their business models and financial structures significantly differ from those in other industries. Data from 2010 to 2020, namely financial information, lists of shareholders, lists of directors and executives, pre-IPO information from the prospectus disclosed on the website of the Securities and Exchange Commission of Thailand, post-IPO information from the financial statements and the annual registration statement (from 56-1) disclosed on the same website and SETSMART online database, were collected. Data analysis was presented in the form of descriptive statistics and inferential statistics using multiple regression. The mediator variable's role was tested employing the method of Baron and Kenny (1986). Results of the mediator variables were confirmed by Sobel Test. This chapter comprises four sections: conclusion of the study, research results and discussions, limitation, and suggestions for future research, respectively.

5.1 Conclusions

According to the data collected from the pre-IPO to post-IPO periods, it was observed that the performance of IPO companies, as measured by return on assets (ROA) and return on equity (ROE), exhibited its highest average in the pre-IPO year, gradually declining thereafter. Specifically, during the pre-IPO year, the average ROA was 11.41%, while the average ROE was 22.47. Upon entering the IPO year, these averages declined to 9.09% for ROA and 13.95% for ROE. One year following the IPO year, the average of both ROA and ROE further fell to 6.89% and 9.52%, respectively. These findings suggest that the companies listed on the Market for Alternative Investment (MAI) tend to experience a diminished performance following the initial public offering. Similarly, Laokulrach (2019) found that small and medium-sized businesses listed on the Market for Alternative Investment (MAI) also exhibited a decline in performance after the initial public offering. Kim et al. (2004) noted that companies listed on the Stock Exchange of Thailand experience a decline in market performance following their initial public offering.

In terms of ownership concentration, with a specific focus on the percentage of shares held by the first largest shareholder and managerial ownership, as measured by the shares held by company directors and executives in the pre-IPO year, several significant trends emerged. On average, the first largest shareholder maintained a substantial ownership stake, accounting for 70.94% of shares, while managerial ownership stood at 56.45%. These averages displayed a consistent pattern of decline over time. During the IPO year, a significant change occurred. In comparison to the pre-IPO year, the first largest existing shareholder average ownership decreased markedly to 51.31%, representing a substantial decline of 19.63%. Concurrently, the average shares held by managerial shareholders decreased to 41.78%, signifying a reduction of 14.67%. Following the IPO, these ownership trends persisted. The average ownership held by the first largest existing shareholder continued to decline, reaching 50.71%, a decrease of 20.23% compared to the pre-IPO year. Managerial shareholders held an average ownership share of 40.49%, representing a fall of 15.96% from the pre-IPO year.

Earnings management was measured by real earnings management and accrual-based earnings management. Real earnings management proxies were based on the model

developed by Decow et al. (1998) and applied by Roychowdhury (2006), Cohen and Zarowin (2010), and Zang (2012). This research concentrated on examining two real earnings management activities: firstly, abnormal level of cash flows from operations that result from sales-based management; and secondly, abnormal level of discretionary expenses resulting from a reduction of discretionary expenses. As well, the modified Jones model (Decow et al., 1995) is employed to estimate discretionary accruals, which represent proxies of accrual-based earnings management.

The data analysis indicates that average real earnings management tends to rise after the IPO. The average stands at -0.017 in the IPO year, -0.011 in the year following the IPO, and 0.004 thereafter. As for discretionary accruals, which constitute a proxy of accrual-based earnings management, it is observed that in the IPO year, the average is highest at 0.044, but one year after the IPO, it decreases to 0.027. Suggested here is that after the IPO, the focus may shift from accruals earnings management to real earnings management. This shift might be because accruals earnings management can be more easily detected by auditors, regulators, and various stakeholders.

The specific research questions were as follows:

Research Question 1: What is the association between pre-IPO ownership structure, earnings management, and firm performance?

Research Question 2: How do changes in the post-IPO ownership structure impact earnings management and firm performance?

Research Question 3: Does earnings management mediate the association between ownership structure and firm performance?

The objectives of this study were to: 1) examine the association of ownership structures with earnings management and firm performance in the pre-IPO year; 2) examine the impact of changes in ownership structure on earnings management and firm performance during and after the IPO year; and 3) investigate the mediating effects of earnings management on the association between ownership structures and firm performance.

The subsequent hypotheses devised were proposed as follows:

Hypothesis 1: Ownership structure is positively associated with firm performance during the IPO period.

Hypothesis 2: Ownership structure is negatively associated with earnings management during the IPO period.

Hypothesis 3: Earnings management mediates the association between ownership structure and IPO firm performance.

5.2 Research Results and Discussion

The following summarizes the research findings and discussion of the findings based on the first research question:

Research Question 1: What is the association between pre-IPO ownership structure, earnings management, and firm performance?

The Association between Pre-IPO Ownership Structure and Firm Performance

The results indicate that pre-IPO ownership concentration had no significant association with firm performance measured by the return on assets and return on equity. This suggests that the company's various management and strategic decision-making aspects do not depend on the largest shareholders. Management and the board of directors have the autonomy and authority to make decisions independently. This outcome is consistent with the findings of Demsetz and Lehn (1985) and Chalarat (2018). Interestingly, the results show that managerial ownership has a positive association with firm performance. This aligns with the agency theory (Jensen and Meckling, 1976), which contends that management's participation in shareholding leads to an alignment of interests between management and shareholders. Consequently, the company's management will make decisions to maximize the firm's value, thereby enhancing how well it performs.

The Association between Pre-IPO Ownership Structure and Earnings Management

The results indicate that pre-IPO ownership concentration had no significant association with earnings management. This agrees with the findings of Burdeos (2021), who studied IPO firms in the Philippines. The absence of a significant association suggests that the largest shareholders may not engage in systematic earnings manipulation, possibly due to oversight by regulators, auditors, and underwriters.

However, this study shows that managerial ownership was significantly negatively associated with real earnings management. This confirms the agency theory (Jensen and Meckling, 1976), suggesting that higher management shareholders align shareholder and management interests, thereby reducing the likelihood of earnings manipulation. When examining the association between ownership concentration, managerial ownership, and accrual-based earnings management, no significant link was found. This absence of a significant can be attributed to the fact that auditors and regulators are able to examine and evaluate accrual-based earnings management practices effectively.

Research Question 2: How do changes in the post-IPO ownership structure impact earnings management and firm performance?

The Impact of Post-IPO Ownership Structure on Firm Performance

The result suggests that the retention of ownership by the largest shareholders and the retention of managerial ownership after the IPO had no significant impact on firm performance. This finding concurs with previous studies, such as those by conducted by Mikkelsen et al. (1997), Bhatia and Singh (2013), and Chalarat (2018) but contradicts Jain and Kini (1994). One possible explanation for this disparity may be the different methods used to gauge ownership retention. Our research directly measures it as the percentage of shares retained by directors and executives, whereas Jain and Kini (1994) measure it as the percentage of shares retained by pre-IPO shareholders. According to the findings, it is worth noting that before a company goes public, managerial ownership is significantly positively associated with firm performance. However, after companies go public, retaining ownership by managers no longer has a statistically significant association with how well the firms perform. This observation suggests that going public may have an impact on managerial ownership and company control structures. In other words, when company shares are distributed to the general public, it could lead to changes in management and control. These changes might be a significant factor contributing to an alteration in the relationship between managerial ownership and firm performance.

The Impact of post-IPO Ownership Structure on Earnings Management

The result suggests that the retention of ownership by the largest shareholders and the retention of managerial ownership after the IPO had no significant effect on earnings management. This contrasts with earlier studies by Fan (2007) and Kalgo et al.

(2016), which detected a negative relationship between earnings management and shareholders retained by pre-IPO shareholders. This difference arises from the method of measuring ownership retention. Fan (2007) and Kalgo et al. (2016) measured it based on the retention of pre-IPO shareholders, while our study evaluates it by considering the retention of the largest shareholders and managerial ownership. Additionally, managing earnings post-IPO becomes more challenging due to companies trading in the securities market being required to adhere to stringent financial reporting and transparency regulations. These regulations limit their ability to employ accounting techniques for earnings management.

The results of this study are noteworthy in that, before the IPO, managerial ownership had a significantly negative association with real earnings management. This suggests that firms with a higher level of managerial ownership can constrain real earnings management practices. However, a significant observation after the IPO is that the level of retained managerial ownership does not show a statistically significant relationship with real earnings management. Indicated here is management wielding less influence on earnings management. This discovery underscores the significant changes in the internal management structure after the IPO.

Research Question 3: Does earnings management mediate the association between ownership structure and firm performance?

The results of the association between ownership structure and firm performance through earnings management before the IPO reveal a positive association between managerial ownership and both ROA and ROE, as well as a negative association with real earnings management. This finding suggests that higher levels of managerial ownership are associated with improved firm performance and a decrease in real earnings management. Also, the analysis of mediation shows that real earnings management fully mediated the relationship between managerial ownership and ROA and partially mediated the relationship between managerial ownership and ROE. These findings are consistent with Rizani, Lisandri, Boedhi, and Syam (2019), who found that managerial ownership influenced corporations' financial performance through the mediation of earnings management. However, after the IPO, the study suggests that the retention of managerial ownership no longer significantly guides firm performance. It has been revealed that the

retention of managerial ownership does not significantly impact real earnings management. Furthermore, real earnings management no longer plays a role as a mediating variable 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 structure, earnings management, and ultimately the operational efficiency of the company after the IPO.

This study highlights the significant shifts in structure during the transition from a private company to a public company. These changes directly affect both the management of earnings and the operational efficiency of the company.

5.3 Limitation of the Study

This study is subject to several limitations as follows.

Firstly, this research concentrates on companies listed on the Market for Alternative Investment (MAI), where the number of newly registered businesses each year is not substantial. Additionally, the data collection period is constrained. These limitations primarily result from changes in accounting standards, such as TFRS 9: financial instruments, TFRS 15: revenue from contracts with customers, TFRS 16: leases, and the impact of the recent COVID-19 pandemic. Therefore, to mitigate these effects, the best data collection period is between 2012 and 2017, resulting in a sample group of 72 companies.

Secondly, this study applied Roychowdhury's (2006) model to detect real earnings management. This model is based on three metrics: abnormal levels of cash flow from operations, discretionary expenses, and production costs. Since the majority of companies listed on the MAI operated in the service industry, it was difficult to accurately estimate normalized production costs. As a result, companies in the industrial sector should exercise caution when interpreting and applying the findings of this study.

Thirdly and lastly, financial data as of the end of the fiscal year was used to evaluate corporate performance in this study. However, during the year of the initial public offering (IPO), the performance of each company may vary due to differences in the first trading day on the stock exchange. Therefore, the interpretation of results in the initial public offering year should be approached with caution.

5.4 Implications and Recommendations

Based on the study on the association among ownership structure, earnings management, and performance of initial public offering (IPO) firms listed on the Market for Alternative Investment (MAI), the theoretical and practical recommendations are explained in more detail below.

5.4.1 Theoretical Implications

The IPO event leads to changes in the ownership structure, separation of control, and management while causing agency problems (Jensen and Meckling, 1976). Moreover, information asymmetry (Akerlof, 1970) usually occurs during the IPO. Having more inside information than outside investors, a company's executives have opportunities and motivations to manage earnings during the IPO event, which signals that the company has good operational efficiency and the opportunity for future growth or expansion. Obviously, such a signal attracts investors and affects the IPO price. In order to reduce conflicts of interests and information asymmetry (Akerlof, 1970) between insiders and outside investors, the results of this study support the agency theory (Jensen and Meckling, 1976), which allows the management to hold shares. This can lead to shared interests between the management and other shareholders. With aligned benefits, the management would maximize the firm's value and market share, ultimately resulting in improved performance.

5.4.2 Practical Implications

The results of this research are useful to several related parties and these are explained as follows.

5.4.2.1 Company Management to be Listed on the Market for Alternative Investment (MAI)

The results indicate that the participation of management shareholders in corporate ownership can reduce earnings management and improve company performance. Consequently, firms planning to be listed on the Market for Alternative Investment (MAI) can use these findings to enhance and devise their ownership structure by encouraging management to have a larger stake in the company, particularly after the IPO. This can contribute to the company's sustainable and long-term growth.

5.4.2.2 Regulators

This research demonstrates that the initial public offering (IPO), the proportion of shares held by the original owners significantly decreases. In the IPO year, the original owners reduce their shareholding significantly. On average, the shareholding of the largest shareholder diminishes by 20%, while the shareholding of management decreases by an average of 15%. For this reason, it is recommended to review the number of shares that original owners - particularly those with managerial roles - can sell before the end of the lock-up period and consider extending this period to more than one year. This is crucial because it wields an impact on the internal management structure, earnings management, and the overall operational effectiveness of the company. Additionally, it is important to ensure the accuracy, completeness, and adequacy of financial statements and disclosures both before and after the IPO to increase confidence in Thailand's capital market in the future.

5.4.2.3 Investors, Analysts, and Relevant Stakeholders

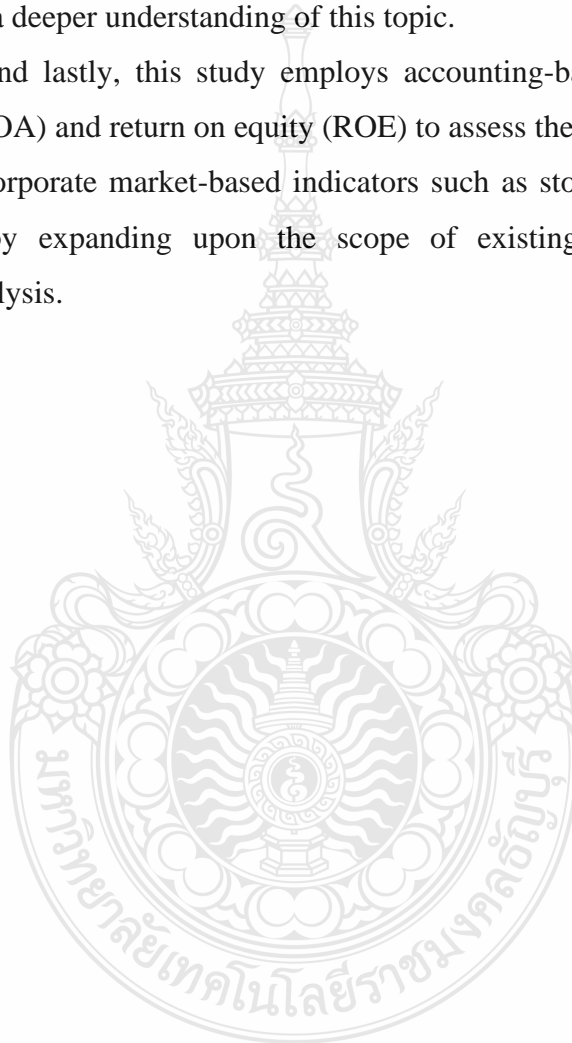
This research demonstrates that after the IPO, the proportion of shares held by management significantly decreases, which has substantial impact on earnings management and operational efficiency within the company. Therefore, a reduction in the shareholding of management after an IPO can serve as a signal that the company's operational efficiency is likely to wane. Thus, according to the signaling theory, it is recommended that investors, analysts, and other stakeholders exercise caution when considering investments in IPO stocks listed on the MAI. Before making investment decisions, it is prudent to seek out additional information in order to be aware of potential risks that may emerge in the future.

5.5 Future Research

Firstly, studies in the future should consider expanding the sample to include companies listed on the Stock Exchange of Thailand (SET), which are large-scale businesses. The ownership structure may have an impact on earnings management and firm performance, distinct from medium- and small-scale businesses. In addition, a comparative study with companies listed on the Market for Alternative Investment (MAI) could provide a more diverse perspective.

Secondly, this study employed the Modified Jones model (Dechow et al., 1995) to examine accrual earnings management (AEM). However, the study did not find a statistically significant relationship between the ownership structure, which includes ownership concentration and managerial ownership, and AEM. Therefore, future research may consider using alternative models that are suitable for companies conducting their initial public offering (IPO) or models that are appropriate for medium and small-scale businesses to gain a deeper understanding of this topic.

Thirdly and lastly, this study employs accounting-based indicators, namely return on assets (ROA) and return on equity (ROE) to assess the success of IPOs. Future research could incorporate market-based indicators such as stock price, P/E ratio, and Tobin's Q, thereby expanding upon the scope of existing research for a more comprehensive analysis.



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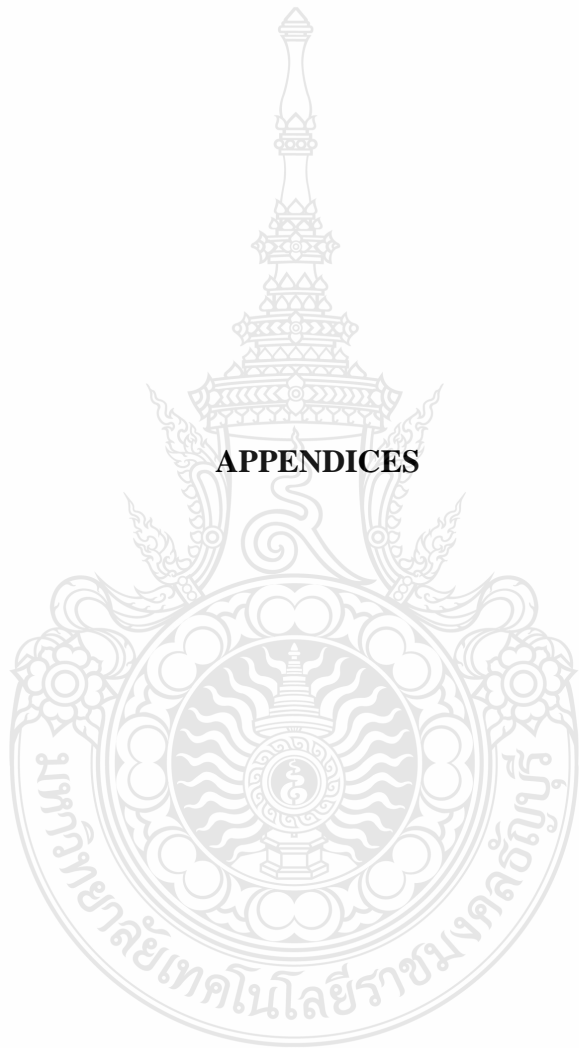
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APPENDICES



APPENDIX A

**The Association between Ownership Structure and Firm Performance
by Considering Each Type of Ownership Structure**

Table A.1 The association between ownership structure and firm performance in the pre-IPO year (Year -1)

Independent Variables	Dependent Variables															
	Model 1: ROA				Model 2: ROA				Model 3: ROE				Model 4: ROE			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	28.445		6.773**		27.443		7.699**		42.101		4.475**		38.858		5.148**	
CONC	.015	.045	.465	1.151					.057	.082	.780	1.151				
MANG					.052	.215	2.104*	1.371					.181	.366	3.481**	1.371
GROWTH	.859	.119	1.133	1.347	.954	.132	1.313	1.331	.557	.037	.328	1.347	.901	.061	.585	1.331
LEV	-24.016	-.531	-5.108**	1.326	-24.834	-.549	-5.496**	1.316	-21.792	-.234	-2.069*	1.326	-24.717	-.266	-2.583*	1.316
AGE	-.159	-.165	-1.531	1.418	-.167	-.173	-1.685	1.396	-.506	-.255	-2.178*	1.418	-.534	-.269	-2.540*	1.396
Year11	-2.328	-.093	-.815	1.599	-2.293	-.092	-.833	1.597	.914	.018	.143	1.599	1.051	.020	.180	1.597
Year13	-3.638	-.197	-1.583	1.891	-3.774	-.204	-1.704	1.888	-3.617	-.095	-.703	1.891	-4.105	-.108	-.875	1.888
Year14	-3.666	-.161	-1.383	1.668	-4.685	-.206	-1.803	1.725	-4.487	-.096	-.756	1.668	-8.064	-.173	-1.465	1.725
Year15	2.809	.133	1.095	1.813	2.321	.110	.934	1.829	9.245	.213	1.609	1.813	7.545	.174	1.434	1.829
Year16	-1.373	-.065	-.521	1.911	-1.380	-.065	-.544	1.909	.492	.011	.083	1.911	.455	.011	.085	1.909
INDUS2	.024	.001	.011	1.635	.062	.003	.029	1.633	.600	.015	.123	1.635	.740	.019	.166	1.633
INDUS3	-5.861	-.171	-1.607	1.386	-7.210	-.210	-2.056*	1.377	-15.807	-.224	-1.934	1.386	-20.422	-.290	-2.750**	1.377
INDUS4	3.785	.167	1.497	1.518	3.346	.147	1.368	1.528	7.707	.165	1.360	1.518	6.167	.132	1.190	1.528
INDUS5	-6.983	-.294	-2.728**	1.423	-5.550	-.234	-2.189*	1.501	-23.280	-.477	-4.059**	1.423	-18.229	-.373	-3.395**	1.501
INDUS6	-1.843	-.074	-.698	1.367	-2.787	-.111	-1.080	1.404	-5.455	-.106	-.922	1.367	-8.773	-.171	-1.605	1.404
INDUS7	-6.055	-.176	-1.771	1.218	-5.455	-.159	-1.659	1.211	-12.816	-.182	-1.673	1.218	-10.673	-.151	-1.533	1.211
Adj. R ²			.421				.461				.312				.428	
F-statistic			4.441**				5.053**				3.147**				4.545**	
Durbin-Watson			2.117				2.057				2.207				2.175	
Observations			72				72				72				72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

CONC = ownership concentration; MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table A.2 The association between ownership structure and firm performance in the IPO year (Year 0)

Independent Variables	Dependent Variables															
	Model 1: ROA				Model 2: ROA				Model 3: ROE				Model 4: ROE			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	11.621		4.205**		9.482		4.022**		11.773		2.521*		9.539		2.446*	
R_CONC	-.013	-.043	-.387	1.164					.024	.045	.420	1.164				
R_MANG					.044	.217	1.848	1.350					.097	.271	2.449*	1.350
GROWTH	2.240	.441	3.675**	1.337	2.321	.457	3.906**	1.344	4.949	.555	4.805**	1.337	5.137	.576	5.225**	1.344
LEV	-11.532	-.356	-3.210**	1.140	-10.951	-.338	-3.156**	1.126	-8.473	-.149	-1.396	1.140	-7.917	-.139	-1.379	1.126
AGE	.122	.200	1.607	1.433	.102	.168	1.399	1.415	.218	.204	1.701	1.433	.194	.181	1.602	1.415
Year12	1.058	.067	.498	1.681	.905	.057	.438	1.679	3.819	.138	1.063	1.681	3.645	.131	1.066	1.679
Year14	-1.150	-.098	-.693	1.870	-1.155	-.099	-.716	1.870	-2.844	-.139	-1.014	1.870	-2.833	-.138	-1.061	1.870
Year15	-2.614	-.182	-1.367	1.647	-3.286	-.229	-1.735	1.708	-4.450	-.177	-1.377	1.647	-5.885	-.234	-1.879	1.708
Year16	.368	.028	.194	1.882	-.153	-.012	-.083	1.908	-2.122	-.091	-.662	1.882	-3.051	-.130	-.993	1.908
Year17	-2.307	-.173	-1.249	1.784	-2.351	-.177	-1.309	1.785	-2.387	-.102	-.765	1.784	-2.497	-.107	-.840	1.785
INDUS2	1.323	.111	.850	1.578	1.333	.112	.880	1.578	3.646	.174	1.386	1.578	3.636	.174	1.452	1.578
INDUS3	-.231	-.011	-.089	1.320	-1.513	-.070	-.605	1.307	-.097	-.003	-.022	1.320	-1.924	-.051	-.465	1.307
INDUS4	.331	.023	.173	1.636	.252	.018	.136	1.636	.117	.005	.036	1.636	-.117	-.005	-.038	1.636
INDUS5	.642	.043	.345	1.428	1.258	.084	.685	1.470	1.924	.073	.612	1.428	3.630	.138	1.194	1.470
INDUS6	.602	.038	.312	1.385	.129	.008	.068	1.412	1.903	.069	.583	1.385	.703	.025	.224	1.412
INDUS7	2.442	.113	.983	1.219	2.677	.124	1.111	1.213	2.040	.054	.486	1.219	2.956	.078	.742	1.213
Adj. R ²			.234				.276				.291				.357	
F-statistic			2.443**				2.802**				2.940**				3.631**	
Durbin-Watson			1.955				2.034				1.996				2.016	
Observations			72				72				72				72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table A.3 The association between ownership structure and firm performance in the post-IPO year (Year +1)

Independent Variables	Dependent Variables															
	Model 1: ROA				Model 2: ROA				Model 3: ROE				Model 4: ROE			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	9.100		2.519*		7.124		2.275*		8.967		1.463		5.909		1.119	
R_CONC	-.031	-.079	-.646	1.143					-.034	-.052	-.417	1.143				
R_MANG					.024	.087	.663	1.336					.059	.130	.971	1.336
GROWTH	3.426	.469	3.575**	1.334	3.342	.458	3.485**	1.335	5.696	.470	3.502**	1.334	5.542	.457	3.428**	1.335
LEV	-9.950	-.262	-2.066*	1.246	-9.954	-.262	-2.067*	1.246	-8.138	-.129	-.996	1.246	-8.208	-.130	-1.011	1.246
AGE	.050	.062	.461	1.419	.029	.037	.271	1.402	.079	.059	.429	1.419	.044	.033	.240	1.402
Year13	1.472	.071	.501	1.537	1.399	.067	.477	1.535	3.026	.087	.607	1.537	2.957	.085	.598	1.535
Year14	2.089	.123	.861	1.570	2.141	.126	.883	1.569	3.867	.137	.939	1.570	3.942	.139	.965	1.569
Year16	1.700	.090	.639	1.527	1.355	.072	.500	1.587	3.024	.096	.670	1.527	2.166	.069	.474	1.587
Year17	.076	.004	.028	1.851	-.080	-.005	-.029	1.858	-1.188	-.041	-.258	1.851	-1.521	-.052	-.331	1.858
Year18	-1.337	-.076	-.509	1.728	-1.258	-.072	-.480	1.725	-1.924	-.066	-.432	1.728	-1.819	-.062	-.411	1.725
INDUS2	.718	.046	.307	1.702	.636	.040	.272	1.708	2.211	.085	.558	1.702	2.005	.077	.508	1.708
INDUS3	1.919	.067	.497	1.411	.758	.027	.196	1.418	5.604	.118	.855	1.411	3.507	.074	.538	1.418
INDUS4	1.580	.083	.596	1.519	1.363	.072	.511	1.535	2.366	.075	.525	1.519	1.875	.060	.417	1.535
INDUS5	1.168	.059	.433	1.432	1.319	.067	.484	1.469	2.492	.076	.545	1.432	3.141	.095	.683	1.469
INDUS6	3.524	.169	1.246	1.426	3.333	.160	1.166	1.456	7.225	.209	1.505	1.426	6.614	.191	1.372	1.456
INDUS7	3.256	.114	.895	1.252	3.050	.107	.844	1.236	4.696	.099	.761	1.252	4.566	.096	.750	1.236
Adj. R ²			.082				.083				.042				.055	
F-statistic			1.424				1.426				1.207				1.274	
Durbin-Watson			2.154				2.161				2.135				2.156	
Observations			72				72				72				72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.



APPENDIX B

**The Association between Ownership Structure and Earnings Management
by Considering Each Type of Ownership Structure**

Table B.1 The association between ownership concentration and earnings management in the pre-IPO year (year -1)

Independent Variables	Dependent Variables															
	Model 1: REM				Model 2: AbCFO				Model 3: AbDEX				Model 4: AEM			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	-.177		-1.247		-.134		-1.185		-.043		-.454		.078		.686	
CONC	.001	.091	.785	1.151	.001	.008	.063	1.151	.001	.126	1.105	1.151	-.001	-.005	-.049	1.151
GROWTH	-.062	-.304	-2.424*	1.347	-.024	-.150	-1.158	1.347	-.039	-.278	-2.256*	1.347	-.054	-.306	-2.607*	1.347
LEV	.197	.154	1.238	1.326	.302	.305	2.380*	1.326	-.105	-.121	-.990	1.326	.060	.055	.472	1.326
AGE	.001	.052	.404	1.418	-.002	-.084	-.632	1.418	.003	.173	1.365	1.418	-.003	-.119	-.990	1.418
Year11	-.020	-.028	-.203	1.599	.039	.072	.511	1.599	-.059	-.123	-.917	1.599	.132	.217	1.701	1.599
Year13	.018	.035	.233	1.891	-.002	-.005	-.034	1.891	.020	.057	.391	1.891	-.071	-.158	-1.138	1.891
Year14	-.078	-.121	-.864	1.668	-.051	-.103	-.713	1.668	-.027	-.061	-.445	1.668	-.088	-.160	-1.227	1.668
Year15	-.133	-.223	-1.536	1.813	-.075	-.162	-1.083	1.813	-.058	-.145	-1.011	1.813	.107	.210	1.542	1.813
Year16	-.117	-.195	-1.308	1.911	-.080	-.173	-1.122	1.911	-.037	-.091	-.621	1.911	-.082	-.161	-1.155	1.911
INDUS2	-.006	-.011	-.079	1.635	-.045	-.109	-.762	1.635	.039	.108	.795	1.635	-.041	-.090	-.694	1.635
INDUS3	.279	.288	2.261*	1.386	.235	.312	2.383*	1.386	.045	.068	.543	1.386	.255	.307	2.580*	1.386
INDUS4	.006	.009	.070	1.518	-.041	-.082	-.599	1.518	.047	.108	.823	1.518	.007	.012	.098	1.518
INDUS5	.162	.241	1.870	1.423	.047	.091	.685	1.423	.115	.252	1.990	1.423	-.015	-.026	-.215	1.423
INDUS6	.050	.071	.559	1.367	.001	.000	.001	1.367	.050	.104	.838	1.367	-.051	-.084	-.713	1.367
INDUS7	-.191	-.196	-1.644	1.218	.027	.035	.287	1.218	-.217	-.330	-2.815*	1.218	.014	.017	.151	1.218
Adj. R ²			.172				.120				.197				.275	
F-statistic			1.981*				1.646				2.160*				2.792**	
Durbin-Watson			2.074				1.906				1.973				1.858	
Observations			72				72				72				72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

CONC = ownership concentration; MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table B.2 The association between managerial ownership and earnings management in the pre-IPO year (Year -1)

Independent Variables	Dependent Variables															
	Model 1: REM				Model 2: AbCFO				Model 3: AbDEX				Model 4: AEM			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	-.039		-.323		-.099		-1.008		.061		.752		.094		.944	
MANG	-.002	-.295	-2.436*	1.371	-.001	-.150	-1.162	1.371	-.001	-.265	-2.191*	1.371	.000	-.082	-.700	1.371
GROWTH	-.062	-.303	-2.543*	1.331	.310	.313	2.482*	1.316	-.103	-.119	-1.007	1.316	.066	.061	.524	1.316
LEV	.207	.162	1.364	1.316	-.024	-.154	-1.213	1.331	-.038	-.272	-2.286*	1.331	-.054	-.309	-2.665*	1.331
AGE	.002	.088	.725	1.396	-.002	-.071	-.550	1.396	.004	.213	1.745	1.396	-.003	-.114	-.957	1.396
Year11	-.016	-.023	-.178	1.597	.040	.073	.522	1.597	-.056	-.117	-.900	1.597	.132	.217	1.709	1.597
Year13	.019	.037	.261	1.888	-.001	-.002	-.013	1.888	.020	.057	.403	1.888	-.070	-.156	-1.127	1.888
Year14	-.040	-.062	-.459	1.725	-.036	-.072	-.499	1.725	-.004	-.010	-.071	1.725	-.079	-.143	-1.083	1.725
Year15	-.111	-.186	-1.331	1.829	-.067	-.145	-.973	1.829	-.044	-.109	-.785	1.829	.112	.219	1.611	1.829
Year16	-.121	-.202	-1.417	1.909	-.081	-.174	-1.147	1.909	-.040	-.100	-.699	1.909	-.083	-.162	-1.164	1.909
INDUS2	-.004	-.008	-.063	1.633	-.045	-.109	-.772	1.633	.041	.112	.849	1.633	-.041	-.090	-.700	1.633
INDUS3	.373	.384	3.169**	1.377	.264	.351	2.716**	1.377	.110	.167	1.379	1.377	.270	.325	2.755**	1.377
INDUS4	.021	.033	.260	1.528	-.035	-.069	-.511	1.528	.056	.129	1.008	1.528	.011	.019	.157	1.528
INDUS5	.118	.175	1.382	1.501	.028	.053	.395	1.501	.090	.198	1.565	1.501	-.028	-.048	-.388	1.501
INDUS6	.082	.116	.952	1.404	.014	.025	.191	1.404	.069	.144	1.176	1.404	-.043	-.070	-.589	1.404
INDUS7	-.199	-.205	-1.800	1.211	.020	.027	.223	1.211	-.219	-.334	-2.938**	1.211	.009	.011	.102	1.211
Adj. R ²			.243				.141				.244				.281	
F-statistic			2.517**				1.775				2.529				2.849**	
Durbin-Watson			2.113				1.868				2.149				1.863	
Observations			72				72				72				72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

CONC = ownership concentration; MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table B.3 The association between the retention ownership concentration and earnings management in the IPO year (Year 0)

Independent Variables	Dependent Variables															
	Model 1: REM				Model 2: AbCFO				Model 3: AbDEX				Model 4: AEM			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	-.149		-1.072		-.056		-.488		-.093		-1.124		-.030		-.325	
R_CONC	.000	-.012	-.100	1.164	-.001	-.081	-.622	1.164	.001	.079	.691	1.164	.000	-.019	-.141	1.164
GROWTH	-.006	-.026	-.196	1.337	.006	.035	.247	1.337	-.012	-.082	-.670	1.337	-.014	-.101	-.715	1.337
LEV	.178	.119	.989	1.140	.251	.218	1.690	1.140	-.072	-.076	-.673	1.140	.124	.136	1.045	1.140
AGE	.002	.078	.575	1.433	-.001	-.054	-.373	1.433	.003	.187	1.479	1.433	-.001	-.060	-.414	1.433
Year12	-.036	-.050	-.340	1.681	.030	.053	.341	1.681	-.066	-.142	-1.039	1.681	.089	.202	1.276	1.681
Year14	.020	.036	.234	1.870	-.010	-.024	-.145	1.870	.029	.086	.593	1.870	.046	.141	.847	1.870
Year15	-.008	-.011	-.078	1.647	.030	.060	.385	1.647	-.038	-.090	-.662	1.647	.066	.165	1.056	1.647
Year16	-.113	-.184	-1.190	1.882	-.043	-.091	-.549	1.882	-.070	-.179	-1.239	1.882	.030	.081	.481	1.882
Year17	-.043	-.069	-.458	1.784	-.034	-.072	-.445	1.784	-.009	-.022	-.155	1.784	-.004	-.010	-.061	1.784
INDUS2	.076	.138	.971	1.578	.003	.007	.044	1.578	.073	.208	1.567	1.578	-.001	-.002	-.015	1.578
INDUS3	.246	.245	1.895	1.320	.160	.207	1.494	1.320	.086	.135	1.117	1.320	.076	.125	.889	1.320
INDUS4	.185	.279	1.935	1.636	.120	.235	1.524	1.636	.065	.154	1.143	1.636	.087	.217	1.388	1.636
INDUS5	.143	.206	1.528	1.428	.009	.018	.122	1.428	.133	.302	2.393*	1.428	.036	.086	.592	1.428
INDUS6	.152	.208	1.566	1.385	.113	.201	1.412	1.385	.039	.084	.678	1.385	.082	.184	1.285	1.385
INDUS7	-.266	-.266	-2.133*	1.219	-.054	-.071	-.529	1.219	-.212	-.332	-2.847**	1.219	-.089	-.146	-1.087	1.219
Adj. R ²			.098				-.036				.210				-.056	
F-statistic			1.512				.836				2.257*				.750	
Durbin-Watson			2.061				2.077				1.745				2.013	
Observations			72				72				72				72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table B.4 The association between the retention of managerial ownership and earnings management in the IPO year (Year 0)

Independent Variables	Dependent Variables															
	Model 1: REM				Model 2: AbCFO				Model 3: AbDEX				Model 4: AEM			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	-.074		-.633		-.087		-.868		.013		.188		-.027		-.338	
R_MANG	-.002	-.252	-1.989	1.350	.000	-.036	-.257	1.350	-.002	-.351	-3.089**	1.350	.000	-.050	-.355	1.350
GROWTH	-.011	-.045	-.355	1.344	.260	.226	1.759	1.126	-.016	-.107	-.945	1.344	-.015	-.105	-.742	1.344
LEV	.159	.106	.918	1.126	.006	.031	.219	1.344	-.101	-.106	-1.020	1.126	.123	.136	1.049	1.126
AGE	.003	.104	.800	1.415	-.001	-.064	-.444	1.415	.004	.240	2.058*	1.415	-.001	-.058	-.401	1.415
Year12	-.031	-.042	-.298	1.679	.028	.050	.317	1.679	-.059	-.126	-.992	1.679	.090	.202	1.282	1.679
Year14	.019	.036	.241	1.870	-.010	-.025	-.150	1.870	.030	.086	.645	1.870	.046	.141	.846	1.870
Year15	.028	.042	.296	1.708	.034	.066	.418	1.708	-.006	-.014	-.106	1.708	.071	.176	1.103	1.708
Year16	-.089	-.144	-.959	1.908	-.044	-.093	-.553	1.908	-.045	-.115	-.851	1.908	.032	.087	.517	1.908
Year17	-.040	-.065	-.445	1.785	-.033	-.071	-.437	1.785	-.006	-.016	-.126	1.785	-.003	-.009	-.055	1.785
INDUS2	.076	.138	1.005	1.578	.003	.008	.051	1.578	.073	.206	1.678	1.578	-.001	-.002	-.014	1.578
INDUS3	.299	.298	2.392*	1.307	.149	.194	1.403	1.307	.149	.233	2.085*	1.307	.079	.131	.940	1.307
INDUS4	.190	.287	2.059*	1.636	.122	.239	1.539	1.636	.069	.163	1.301	1.636	.088	.219	1.402	1.636
INDUS5	.104	.150	1.133	1.470	-.001	-.001	-.008	1.470	.105	.236	1.990	1.470	.031	.073	.493	1.470
INDUS6	.180	.246	1.902	1.412	.118	.211	1.466	1.412	.062	.132	1.137	1.412	.085	.193	1.334	1.412
INDUS7	-.285	-.285	-2.373*	1.213	-.063	-.082	-.613	1.213	-.223	-.348	-3.230**	1.213	-.092	-.152	-1.133	1.213
Adj. R ²			.157				-.042				.319				-.054	
F-statistic			1.882*				.810				3.218**				.759	
Durbin-Watson			2.129				2.086				1.965				2.003	
Observations			72				72				72				72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table B.5 The association between the retention ownership concentration and earnings management in post-IPO year (Year +1)

Independent Variables	Dependent Variables															
	Model 1: REM				Model 2: AbCFO				Model 3: AbDEX				Model 4: AEM			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	-.201		-2.566*		-.170		-2.257*		-.031		-.639		-.081		-1.346	
R_CONC	.001	.093	.814	1.143	.001	.086	.668	1.143	.000	.030	.278	1.143	.000	.060	.482	1.143
GROWTH	-.003	-.021	-.167	1.334	.009	.060	.430	1.334	-.012	-.112	-.942	1.334	.022	.182	1.348	1.334
LEV	.036	.041	.340	1.246	.125	.167	1.240	1.246	-.089	-.159	-1.386	1.246	.010	.016	.124	1.246
AGE	.007	.350	2.752**	1.419	.004	.236	1.641	1.419	.003	.233	1.904	1.419	.004	.277	1.987	1.419
Year13	-.008	-.016	-.120	1.537	.050	.121	.810	1.537	-.057	-.186	-1.460	1.537	-.017	-.051	-.351	1.537
Year14	.023	.058	.431	1.570	.016	.049	.324	1.570	.006	.025	.194	1.570	.004	.015	.105	1.570
Year16	-.042	-.096	-.726	1.527	-.028	-.075	-.500	1.527	-.014	-.050	-.398	1.527	-.053	-.174	-1.202	1.527
Year17	-.056	-.139	-.953	1.851	-.016	-.046	-.280	1.851	-.040	-.155	-1.111	1.851	-.063	-.222	-1.398	1.851
Year18	-.009	-.022	-.159	1.728	.017	.048	.303	1.728	-.026	-.099	-.731	1.728	.002	.009	.057	1.728
INDUS2	.061	.167	1.198	1.702	.019	.061	.387	1.702	.042	.179	1.340	1.702	.052	.203	1.331	1.702
INDUS3	.025	.037	.294	1.411	-.030	-.054	-.373	1.411	.055	.129	1.060	1.411	.013	.028	.203	1.411
INDUS4	.056	.127	.966	1.519	-.001	-.002	-.013	1.519	.056	.201	1.588	1.519	.010	.032	.223	1.519
INDUS5	.184	.403	3.146**	1.432	.082	.212	1.464	1.432	.102	.346	2.821**	1.432	.113	.351	2.508*	1.432
INDUS6	.063	.132	1.030	1.426	.016	.039	.267	1.426	.048	.154	1.256	1.426	.076	.225	1.609	1.426
INDUS7	-.149	-.226	-1.890	1.252	-.017	-.030	-.222	1.252	-.132	-.313	-2.722**	1.252	.016	.035	.266	1.252
Adj. R ²			.188				-.037				.253				.029	
F-statistic			2.098				.831				2.599**				1.143	
Durbin-Watson			2.076				1.977				1.560				2.223	
Observations			72				72				72				72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table B.6 The association between the retention managerial ownership and earnings management in post-IPO year (Year +1)

Independent Variables	Dependent Variables															
	Model 1: REM				Model 2: AbCFO				Model 3: AbDEX				Model 4: AEM			
	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF	B	Beta	t	VIF
Constant	-.162		-2.370*		-.159		-2.430*		-.003		-.083		-.086		-1.675	
R_MANG	.000	-.017	-.135	1.336	.001	.115	.827	1.336	-.001	-.179	-1.542	1.336	.001	.179	1.342	1.336
GROWTH	-.002	-.013	-.104	1.335	.008	.058	.415	1.335	-.010	-.097	-.833	1.335	.021	.174	1.303	1.335
LEV	.035	.039	.329	1.246	.123	.164	1.221	1.246	-.088	-.157	-1.395	1.246	.008	.013	.099	1.246
AGE	.007	.370	2.906**	1.402	.004	.237	1.661	1.402	.003	.262	2.198*	1.402	.003	.265	1.937	1.402
Year13	-.005	-.011	-.086	1.535	.052	.126	.844	1.535	-.057	-.185	-1.485	1.535	-.016	-.047	-.330	1.535
Year14	.022	.055	.407	1.569	.016	.048	.314	1.569	.006	.022	.178	1.569	.004	.015	.105	1.569
Year16	-.040	-.093	-.684	1.587	-.037	-.099	-.653	1.587	-.004	-.013	-.099	1.587	-.065	-.212	-1.457	1.587
Year17	-.055	-.135	-.920	1.858	-.018	-.053	-.320	1.858	-.037	-.140	-1.024	1.858	-.067	-.235	-1.492	1.858
Year18	-.011	-.027	-.190	1.725	.016	.045	.285	1.725	-.026	-.102	-.769	1.725	.002	.007	.049	1.725
INDUS2	.061	.168	1.195	1.708	.017	.054	.341	1.708	.044	.190	1.448	1.708	.049	.192	1.273	1.708
INDUS3	.043	.065	.504	1.418	-.034	-.060	-.417	1.418	.076	.180	1.504	1.418	.001	.000	.001	1.418
INDUS4	.057	.131	.985	1.535	-.005	-.013	-.086	1.535	.062	.221	1.778	1.535	.004	.013	.094	1.535
INDUS5	.188	.411	3.154**	1.469	.096	.246	1.684	1.469	.092	.314	2.575*	1.469	.127	.395	2.826*	1.469
INDUS6	.062	.129	.991	1.456	.006	.015	.101	1.456	.056	.181	1.490	1.456	.065	.192	1.381	1.456
INDUS7	-.142	-.215	-1.800	1.236	-.009	-.016	-.121	1.236	-.133	-.314	-2.807**	1.236	.022	.047	.367	1.236
Adj. R ²			.179				-.033				.282				.056	
F-statistic			2.032*				.850				2.859**				1.279	
Durbin-Watson			2.088				2.024				1.629				2.315	
Observations			72				72				72				72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_CONC = retention of ownership concentration; R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.



APPENDIX C

**The Association between Managerial Ownership, Earnings Management,
and Firm Performance**

Table C.1 The association between managerial ownership, real earnings management, and return on assets in the pre-IPO year (Year-1)

Independent Variables	Model 1: ROA			Model 2: REM			Model 3: ROA			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	27.443		7.699**	-.039		-.323	26.959		8.252**	
MANG	.052	.215	2.104*	-.002	-.295	-2.436*	.026	.110	1.122	1.516
GROWTH	.954	.132	1.313	-.062	-.303	-2.543*	.178	.025	.253	1.484
LEV	-24.834	-.549	-5.496**	.207	.162	1.364	-22.245	-.492	-5.289**	1.360
AGE	-.167	-.173	-1.685	.002	.088	.725	-.137	-.142	-1.500	1.409
REM							-12.503	-.354	-3.432**	1.674
Year11	-2.293	-.092	-.833	-.016	-.023	-.178	-2.498	-.100	-.991	1.598
Year13	-3.774	-.204	-1.704	.019	.037	.261	-3.531	-.191	-1.740	1.891
Year14	-4.685	-.206	-1.803	-.040	-.062	-.459	-5.186	-.228	-2.175*	1.731
Year15	2.321	.110	.934	-.111	-.186	-1.331	.932	.044	.403	1.887
Year16	-1.380	-.065	-.544	-.121	-.202	-1.417	-2.890	-.137	-1.222	1.977
INDUS2	.062	.003	.029	-.004	-.008	-.063	.007	.000	.004	1.634
INDUS3	-7.210	-.210	-2.056*	.373	.384	3.169**	-2.543	-.074	-.729	1.624
INDUS4	3.346	.147	1.368	.021	.033	.260	3.613	.159	1.612	1.530
INDUS5	-5.550	-.234	-2.189*	.118	.175	1.382	-4.078	-.172	-1.727	1.552
INDUS6	-2.787	-.111	-1.080	.082	.116	.952	-1.755	-.070	-.737	1.427
INDUS7	-5.455	-.159	-1.659	-.199	-.205	-1.800	-7.940	-.231	-2.564*	1.281
Adj. R ²			.461			.243			.548	
F-statistic			5.053**			2.517**			6.386**	
Durbin-Watson			2.057			2.113			1.981	
Observations			72			72			72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table C.2 The association between managerial ownership, real earnings management, and return on equity in the pre-IPO year (Year-1)

Independent Variables	Model 1: ROE			Model 2: REM			Model 3: ROE			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	38.858		5.148**	-.039		-.323	37.933		5.378**	
MANG	.181	.366	3.481**	-.002	-.295	-2.436*	.133	.269	2.603*	1.516
GROWTH	.901	.061	.585	-.062	-.303	-2.543*	-.584	-.039	-.385	1.484
LEV	-24.717	-.266	-2.583*	.207	.162	1.364	-19.763	-.213	-2.177*	1.360
AGE	-.534	-.269	-2.540*	.002	.088	.725	-.476	-.240	-2.415*	1.409
REM							-23.922	-.330	-3.042**	1.674
Year11	1.051	.020	.180	-.016	-.023	-.178	.658	.013	.121	1.598
Year12	-4.105	-.108	-.875	.019	.037	.261	-3.641	-.096	-.831	1.891
Year13	-8.064	-.173	-1.465	-.040	-.062	-.459	-9.023	-.193	-1.753	1.731
Year14	7.545	.174	1.434	-.111	-.186	-1.331	4.887	.113	.980	1.887
Year15	.455	.011	.085	-.121	-.202	-1.417	-2.434	-.056	-.477	1.977
INDUS2	.740	.019	.166	-.004	-.008	-.063	.634	.016	.152	1.634
INDUS3	-20.422	-.290	-2.750**	.373	.384	3.169**	-11.492	-.163	-1.526	1.624
INDUS4	6.167	.132	1.190	.021	.033	.260	6.678	.143	1.380	1.530
INDUS5	-18.229	-.373	-3.395**	.118	.175	1.382	-15.414	-.316	-3.024**	1.552
INDUS6	-8.773	-.171	-1.605	.082	.116	.952	-6.799	-.132	-1.322	1.427
INDUS7	-10.673	-.151	-1.533	-.199	-.205	-1.800	-15.429	-.219	-2.308*	1.281
Adj. R ²			.428			.243		∞	.502	
F-statistic			4.545**			2.517**			5.468**	
Durbin-Watson			2.175			2.113			2.085	
Observations			72			72			72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

MANG = managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year11= Dummy equal 1 if year 2011; 0 otherwise, Year12= Dummy equal 1 if year 2012; 0 otherwise, Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table C.3 The association between managerial ownership, real earnings management, and return on assets in the IPO year (Year 0)

Independent Variables	Model 1: ROA			Model 2: REM			Model 3: ROA			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	9.482		4.022**	-.074		-.633	9.019		3.975**	
R_MANG	.044	.217	1.848	-.002	-.252	-1.989	.030	.144	1.239	1.445
GROWTH	2.321	.457	3.906**	-.011	-.045	-.355	2.255	.444	3.953**	1.347
LEV	-10.951	-.338	-3.156**	.159	.106	.918	-9.962	-.308	-2.971**	1.143
AGE	.102	.168	1.399	.003	.104	.800	.121	.198	1.708	1.431
REM							-6.223	-.288	-2.424*	1.504
Year12	.905	.057	.438	-.031	-.042	-.298	.714	.045	.360	1.681
Year14	-1.155	-.099	-.716	.019	.036	.241	-1.034	-.089	-.668	1.872
Year15	-3.286	-.229	-1.735	.028	.042	.296	-3.112	-.217	-1.712	1.711
Year16	-.153	-.012	-.083	-.089	-.144	-.959	-.707	-.053	-.394	1.939
Year17	-2.351	-.177	-1.309	-.040	-.065	-.445	-2.600	-.195	-1.507	1.791
INDUS2	1.333	.112	.880	.076	.138	1.005	1.805	.151	1.232	1.607
INDUS3	-1.513	-.070	-.605	.299	.298	2.392*	.345	.016	.137	1.441
INDUS4	.252	.018	.136	.190	.287	2.059*	1.437	.100	.780	1.760
INDUS5	1.258	.084	.685	.104	.150	1.133	1.904	.127	1.069	1.503
INDUS6	.129	.008	.068	.180	.246	1.902	1.249	.079	.666	1.503
INDUS7	2.677	.124	1.111	-.285	-.285	-2.373*	.901	.042	.372	1.335
Adj. R ²			.276			.157			.334	
F-statistic			2.802**			1.882*			3.223**	
Durbin-Watson			2.034			2.129			1.909	
Observations			72			72			72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table C.4 The association between managerial ownership, real earnings management, and return on equity in the IPO year (Year 0)

Independent Variables	Model 1: ROE			Model 2: REM			Model 3: ROE			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	9.539		2.446*	-.074		-.633	8.651		2.348*	
R_MANG	.097	.271	2.449*	-.002	-.252	-1.989	.069	.192	1.780	1.445
GROWTH	5.137	.576	5.225**	-.011	-.045	-.355	5.012	.562	5.408**	1.347
LEV	-7.917	-.139	-1.379	.159	.106	.918	-6.022	-.106	-1.106	1.143
AGE	.194	.181	1.602	.003	.104	.800	.229	.214	1.995	1.431
REM							-11.915	-.314	-2.858**	1.504
Year12	3.645	.131	1.066	-.031	-.042	-.298	3.279	.118	1.018	1.681
Year14	-2.833	-.138	-1.061	.019	.036	.241	-2.602	-.127	-1.035	1.872
Year15	-5.885	-.234	-1.879	.028	.042	.296	-5.552	-.220	-1.881	1.711
Year16	-3.051	-.130	-.993	-.089	-.144	-.959	-4.111	-.176	-1.409	1.939
Year17	-2.497	-.107	-.840	-.040	-.065	-.445	-2.973	-.127	-1.061	1.791
INDUS2	3.636	.174	1.452	.076	.138	1.005	4.541	.217	1.908	1.607
INDUS3	-1.924	-.051	-.465	.299	.298	2.392*	1.634	.043	.399	1.441
INDUS4	-.117	-.005	-.038	.190	.287	2.059*	2.153	.085	.719	1.760
INDUS5	3.630	.138	1.194	.104	.150	1.133	4.868	.185	1.682	1.503
INDUS6	.703	.025	.224	.180	.246	1.902	2.847	.103	.935	1.503
INDUS7	2.956	.078	.742	-.285	-.285	-2.373*	-.444	-.012	-.113	1.335
Adj. R ²			.357			.157			.430	
F-statistic			3.631**			1.882*			4.351**	
Durbin-Watson			2.016			2.129			1.778	
Observations			72			72			72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year12= Dummy equal 1 if year 2012; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year15= Dummy equal 1 if year 2015; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table C.5 The association between managerial ownership, real earnings management, and return on assets in the post-IPO year (Year +1)

Independent Variables	Model 1: ROA			Model 2: REM			Model 3: ROA			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	7.124		2.275*	-.162		-2.370*	3.637		1.243	
R_MANG	.024	.087	.663	.000	-.017	-.135	.021	.079	.673	1.336
GROWTH	3.342	.458	3.485**	-.002	-.013	-.104	3.295	.451	3.858**	1.335
LEV	-9.954	-.262	-2.067*	.035	.039	.329	-9.210	-.243	-2.145*	1.249
AGE	.029	.037	.271	.007	.370	2.906**	.177	.220	1.713	1.613
REM							-21.506	-.497	-3.948**	1.544
Year13	1.399	.067	.477	-.005	-.011	-.086	1.281	.061	.490	1.535
Year14	2.141	.126	.883	.022	.055	.407	2.605	.153	1.205	1.574
Year16	1.355	.072	.500	-.040	-.093	-.684	.484	.026	.199	1.600
Year17	-.080	-.005	-.029	-.055	-.135	-.920	-1.257	-.072	-.514	1.886
Year18	-1.258	-.072	-.480	-.011	-.027	-.190	-1.493	-.085	-.639	1.727
INDUS2	.636	.040	.272	.061	.168	1.195	1.950	.124	.924	1.751
INDUS3	.758	.027	.196	.043	.065	.504	1.675	.059	.485	1.424
INDUS4	1.363	.072	.511	.057	.131	.985	2.597	.137	1.084	1.561
INDUS5	1.319	.067	.484	.188	.411	3.154**	5.363	.271	2.034*	1.730
INDUS6	3.333	.160	1.166	.062	.129	.991	4.664	.224	1.816	1.482
INDUS7	3.050	.107	.844	-.142	-.215	-1.800	-.006	.000	-.002	1.308
Adj. R ²			.083			.179			.272	
F-statistic			1.426			2.032*			2.659**	
Durbin-Watson			2.161			2.088			1.942	
Observations			72			72			72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

Table C.6 The association between managerial ownership, real earnings management, and return on assets in the post-IPO year (Year +1)

Independent Variables	Model 1: ROE			Model 2: REM			Model 3: ROE			VIF
	B	Beta	t	B	Beta	t	B	Beta	t	
Constant	5.909		1.119	-.162		-2.370*	-.024		-.005	
R_MANG	.059	.130	.971	.000	-.017	-.135	.055	.121	1.021	1.336
GROWTH	5.542	.457	3.428**	-.002	-.013	-.104	5.462	.450	3.803**	1.335
LEV	-8.208	-.130	-1.011	.035	.039	.329	-6.942	-.110	-.962	1.249
AGE	.044	.033	.240	.007	.370	2.906**	.295	.221	1.697	1.613
REM							-36.587	-.509	-3.993**	1.544
Year13	2.957	.085	.598	-.005	-.011	-.086	2.756	.080	.627	1.535
Year14	3.942	.139	.965	.022	.055	.407	4.731	.167	1.301	1.574
Year16	2.166	.069	.474	-.040	-.093	-.684	.684	.022	.168	1.600
Year17	-1.521	-.052	-.331	-.055	-.135	-.920	-3.524	-.121	-.858	1.886
Year18	-1.819	-.062	-.411	-.011	-.027	-.190	-2.217	-.076	-.564	1.727
INDUS2	2.005	.077	.508	.061	.168	1.195	4.241	.162	1.195	1.751
INDUS3	3.507	.074	.538	.043	.065	.504	5.068	.107	.872	1.424
INDUS4	1.875	.060	.417	.057	.131	.985	3.974	.126	.986	1.561
INDUS5	3.141	.095	.683	.188	.411	3.154**	10.019	.305	2.259*	1.730
INDUS6	6.614	.191	1.372	.062	.129	.991	8.878	.256	2.055*	1.482
INDUS7	4.566	.096	.750	-.142	-.215	-1.800	-.634	-.013	-.114	1.308
Adj. R ²			.055			.179			.254	
F-statistic			1.274			2.032*			2.510**	
Durbin-Watson			2.156			2.088			1.934	
Observations			72			72			72	

Note: *, ** Indicate .05 and .01 significance levels, respectively.

R_MANG = retention of managerial ownership; Growth = firm growth; LEV = leverage; AGE = firm age; Year13= Dummy equal 1 if year 2013; 0 otherwise, Year14= Dummy equal 1 if year 2014; 0 otherwise, Year16= Dummy equal 1 if year 2016; 0 otherwise, Year17= Dummy equal 1 if year 2017; 0 otherwise, Year18= Dummy equal 1 if year 2018; 0 otherwise, INDUS2= Dummy equal 1 if industrials group; 0 otherwise, INDUS3= Dummy equal 1 if consumer products group; 0 otherwise, INDUS4= Dummy equal 1 if property and construction group; 0 otherwise, INDUS5= Dummy equal 1 if resources group; 0 otherwise, INDUS6= Dummy equal 1 if technology group; 0 otherwise, INDUS7= Dummy equal 1 if agro and food industry group; 0 otherwise.

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