

Moderating Effect of Institutional Investors on the Relationship Between Board Structure and Firm Performance: Evidence from Listed Companies on the Stock Exchange of Thailand

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Abstract

This study aimed to examine the influence of institutional investors on the relationship between board structure and firm performance, measured by return on assets (ROA), in listed companies on the Stock Exchange of Thailand during 2020–2022. The analysis utilized data from 1,148 companies retrieved from the SETSMART annual database. Multiple regression analysis was conducted to test the hypotheses. The findings indicate that board structure, specifically board size, has a negative relationship with firm performance, while institutional investors do not exhibit a statistically significant relationship with firm performance. However, the analysis of moderating variables reveals that the proportion of board management, in conjunction with institutional investors, has a statistically significant positive influence on firm performance. Conversely, the proportion of independent directors and board of auditors, when combined with institutional investors, shows a statistically significant negative influence on firm performance.

Keywords: Board Structure, Institutional Investors, Firm Performance

Introduction

Corporate governance plays a crucial role in modern business and is essential to an organization's overall success. The principles of good corporate governance, as outlined in the CG Code introduced by the Stock Exchange of Thailand in 2017, emphasize key elements of relationship structures and practices designed to promote transparency and accountability within board of directors. These principles aim to build investor confidence, a critical factor for publicly listed companies where the public holds shares. The board of directors serves as the strategic decision-maker, responsible for guiding the firm performance and direction. According to agency theory, the primary duty of board is to safeguard the interests of shareholders (Fama and Jensen, 1983). Consequently, the board is regarded as the principal agent tasked with overseeing and disciplining the CEO and engaging in transparent strategic management to ensure the company's success.

The composition of board of directors, a key aspect of corporate governance, encompasses individuals with diverse backgrounds and experiences. Such diversity enables

the board to consider a broad range of perspectives, ultimately leading to better decision-making and greater effectiveness. Board diversity can be achieved by including different types of directors, each contributing unique expertise and perspectives. Independent directors, for instance, are not affiliated with the company and are free from ties to the management team. Their primary responsibility is to act in the best interests of the company and its shareholders, offering unbiased perspectives on critical decisions. Board management, by contrast, possess inside knowledge of the company's operations and provides valuable operational insights. Non-Board management, who are not part of the management team, contribute fresh perspectives and independent advice to board discussions. Board of auditors, integral to corporate governance, ensures effective internal controls and accurate financial reporting. Before commencing their work, board of auditors members must understand the processes through which management develops and reports internal financial information.

A diverse board of directors with expertise relevant to the business can identify organizational trends, uncover potential opportunities for growth, and enhance the company's strategic direction. Research consistently supports the notion that companies with diverse boards tend to achieve better financial performance. For example, Rehman (2021) found that board management positively impact firm performance. Similarly, Shubhi and Singh (2020) identified a positive relationship between board factors—such as size, independence, education, frequency of meetings, board of auditors composition, and firm performance, which can reduce agency costs. Sharifah et al. (2016) observed a mixed relationship between the proportion of independent directors and firm performance, noting that independent directors can create shareholder value. Achariya et al. (2018) highlighted that the structure of board of directors significantly influences subcommittees, such as board of auditors, and that the board's resource provision and support roles positively affect firm performance. Finally, Pipatsorn Atchawapornwitoon (2021) emphasized the critical role of directors and shareholder structure in corporate governance, noting their significant impact on firm performance. These findings underscore the importance of adopting good corporate governance practices for companies listed on the Stock Exchange of Thailand, ensuring sustainable performance and value creation in the future.

While the above findings suggest a significant positive relationship between board structure and firm performance, other studies report conflicting results, indicating a negative or non-significant relationship between board structure and corporate financial performance. James (2020), in his study *Understanding the impact of board structure on firm performance: A comprehensive literature review*, highlights the ongoing debate about the extent to which board structure impacts firm performance. This debate persists due to a lack of consistent empirical evidence and the varying conclusions drawn by different researchers. For instance, Sharifah (2016) found that even a company with the highest proportion of independent directors may not necessarily achieve greater efficiency. This finding suggests that the presence of independent directors should be evaluated critically to ensure it adds value for

shareholders. Similarly, Jindara Saeng-angkanawin (2017) reported that the size of board and the proportion of independent directors do not significantly correlate with return on equity (ROE).

Based on the above conclusions, a gap in the study of board structure and firm performance was identified. To address this gap and provide a more comprehensive understanding, the researcher introduces institutional investors as a moderating variable that may influence the relationship between board structure and firm performance. Freeman (1984) articulated the stakeholder theory, which adopts a capitalist perspective emphasizing the interconnected relationships between businesses and their stakeholders, including customers, suppliers, employees, investors, and communities. According to this theory, companies should create value for all stakeholders, not just shareholders. The integration of stakeholder theory with institutional investors highlights the crucial role of institutional investors in promoting sustainability. This perspective aligns with the findings of Cornett, Marcus, and Tehranian (2003), who reported a significant positive relationship between institutional investor participation and the performance of large companies. They argued that institutional investors, equipped with extensive investment experience and financial knowledge, are well-positioned to protect stakeholder interests. Similarly, Sahut and Gharbi (2010) found a significant positive relationship between institutional investors and firm performance, as measured by Tobin's Q. Mahoney and Robert (2007) further observed that the level of institutional investor shareholding positively correlates with business sustainability. Additionally, Junyao Chen et al. (2022) concluded that a higher proportion of institutional investors contributes to improved performance in listed companies.

From the above literature review, the following research question arises: Do institutional investors influence the relationship between board structure and improved firm performance? This question highlights the need to examine these three aspects together to broaden the understanding of the roles of board of directors, institutional investors, and firm performance. Such a study could provide valuable insights for the boards of directors of companies listed on the Stock Exchange of Thailand and for institutional investors. By utilizing this information, organizations can enhance their governance practices, recognize their value, and prioritize their responsibilities, ultimately benefiting the company's fundraising capabilities and promoting sustainability. Furthermore, the findings could serve as a useful resource for shareholders, investors, and other stakeholders, offering a foundation for evaluating a company's efficiency and effectiveness. This expanded understanding could aid in fostering long-term value creation and responsible corporate practices.

Research Objectives

This study aimed to examine the influence of institutional investors on the relationship between board structure and firm performance, measured by return on assets (ROA), in listed companies on the Stock Exchange

Hypothesis

Hypothesis 1: The structure of board of directors is positively related to firm performance.

Hypothesis 2: The presence and influence of institutional investors are positively related to firm performance.

Hypothesis 3: The regulatory influence of institutional investors moderates the relationship between board structure and firm performance.

Literature review

1. Agency Theory

The principal-agent problem is a fundamental issue in political science and economics. This theory, developed in the 1970s by Michael Jensen of Harvard Business School and William Meckling of the University of Rochester, was first introduced in their seminal paper published in 1976. Agency theory seeks to explain and address conflicts that arise in the relationship between principals (shareholders) and agents (managers). In a typical principal-agent relationship, agents are expected to act in the best interests of the principals rather than prioritizing their own interests. However, differing objectives between principals and agents can lead to conflicts. Some agents may act in ways that do not fully align with the best interests of the principal, resulting in miscommunication, inefficiencies, and financial losses within the company. Conflicts may also arise when managers prioritize their own interests, potentially enacting policies or engaging in activities, such as making deals with politicians, that do not benefit the company or its shareholders. These actions can undermine organizational efficiency and shareholder value. One way to address such conflicts is through the implementation of good corporate governance practices. Corporate governance provides a framework to realign the interests of principals and agents by setting clear rules and incentives for agents. For instance, aligning agents' compensation with performance metrics ensures that their financial rewards are directly tied to their contributions to company success. Under this system, agents are incentivized to perform well, as their personal financial benefits are directly linked to organizational outcomes. Conversely, poor performance results in reduced benefits, fostering accountability and alignment of interests.

2. Stakeholder Theory

Freeman (1984) clarified stakeholder theory, emphasizing that effective management of an organization's stakeholders requires mechanisms to build trust among all parties. This can be achieved by ensuring fair and equitable compensation and care for stakeholders, whether they are customers, employees, financial managers, shareholders, joint venture partners, or others. The relationship between an organization's social performance and its stakeholders is also a critical component of stakeholder theory (Srisamon and Kobkul, 2015). Stakeholders can be categorized as either internal or external. Internal stakeholders are directly connected to the organization through relationships such as employment, ownership,

or investment. External stakeholders, on the other hand, do not work directly with the organization but are impacted by its actions and outcomes. Examples of external stakeholders include suppliers, creditors, and the public. A common challenge for organizations with diverse stakeholders is the potential for conflicting interests. For instance, shareholders often prioritize maximizing profits and shareholder value, which can lead companies to tightly control labor costs. This focus may conflict with the interests of employees, who value fair wages and job satisfaction. There is a widespread misconception that public companies are legally obligated to maximize shareholder value, even at the expense of ethical standards, environmental sustainability, or employee welfare. However, this belief is not supported by legal precedent. Several legal decisions, including rulings by the U.S. Supreme Court, have clarified that corporations are not required to prioritize shareholder wealth over all other considerations. In the *Hobby Lobby* case, the U.S. Supreme Court stated: “Modern corporate law does not require for-profit corporations to pursue profits at the expense of other interests, and many do not” (Lynn Stout, 2015).

3. Signaling Theory

Signaling theory addresses the issue of information asymmetry between a company and external stakeholders. A key aspect of signaling theory is that when a company shares positive information about its business operations and performance, it signals good prospects to the market. Conversely, a company that discloses negative information risks losing the trust of the market (Dwiyanti, 2010). Signaling theory is one of the fundamental frameworks for understanding financial management. The signals a company sends to external parties, such as investors, can take various forms—some are directly observable, while others require deeper analysis to interpret. The connection between signaling theory and a company’s financial performance lies in the transparency and dissemination of information. When a company provides comprehensive and accurate disclosures, it sends a positive signal to stakeholders, including shareholders. These disclosures help stakeholders gain new insights into the company’s operations, building trust and confidence in the organization. This increased trust can lead to improved financial performance, as reflected in higher profits and enhanced return on equity.

Joseph (2002) observed that while some individuals actively seek to convey information, others do not. The mere act of sharing information allows people to adjust their behavior based on the information received. This dynamic highlights why imperfections in information distribution can have significant impacts. Signaling theory offers a unique, practical, and empirically testable approach to understanding social selection under conditions of imperfect information. In this review, researchers aim to clarify existing concepts by connecting insights from capital market research within the context of developing countries. Signaling theory has been extensively applied in accounting and auditing studies, suggesting that management often sends signals about a company’s status through various financial

disclosures, which investors interpret as indicators of company health. One critical aspect of these disclosures is the timeliness of earnings, which benefits all stakeholders.

Moreover, governance information about listed companies is publicly accessible, providing an observable signal for outside investors. This allows investors to assess the effectiveness of a company's governance from a shareholder's perspective (Certo et al., 2001). Within corporate governance, ownership structure and board of directors serve as essential mechanisms to address agency conflicts. Agency theory, a fundamental governance concept, posits that conflicts of interest emerge between agents (managers) and principals (owners) (Eisenhardt, 1989; Fama & Jensen, 1983). Ownership structures and boards of directors act as governance tools that help mitigate these conflicts (Denis, Denis, & Sarin, 1999; Li, 1994). These governance mechanisms send crucial signals to investors about how companies address agency problems. Consequently, the information asymmetry between potential investors and companies can be reduced based on the signals derived from corporate governance practices (Ahmad-Zaluki & Wan-Hussin, 2010; Certo et al., 2001; Chen, Chung, Hsu, & Wu, 2010).

4. Concepts of Corporate Governance

The globalization of capital markets and increased competition in capital financing have led to the widespread adoption of internationally accepted corporate governance standards and processes. This development is particularly significant for emerging and transitional economies, which often seek to regain investor confidence through adherence to these standards (Kawamura et al., 2013). The foundational theory of corporate governance is rooted in agency theory, complemented by moral impact theory, stewardship theory, and stakeholder theory. Additionally, corporate governance has been enriched by theories such as resource dependence theory, transaction cost theory, and political theory, along with ethics theory, information asymmetry theory, and efficient market theory. These theoretical frameworks explore various variables, including the structure of board of directors, board of auditors, the independence of directors, the role of senior management, and social interactions beyond legal regulatory boundaries (Borlea et al., 2013). In Thailand, the corporate governance system is influenced by a civil law legal framework, which establishes general principles guiding the relationship among board of directors, management, and shareholders. This system aims to ensure effective company leadership and operational oversight. Companies that embrace strong corporate governance principles create transparent operational environments, thereby enhancing competitiveness, preserving capital, and increasing long-term shareholder value. An effective corporate governance system features an efficient, transparent, and auditable management structure, which fosters trust and confidence among shareholders, investors, and other relevant stakeholders. The core of corporate governance lies in the role of the board of directors, which oversees business operations by monitoring, directing, and controlling management activities to safeguard shareholder interests. Moreover, good corporate governance establishes rules, regulations, and

mechanisms within a company to ensure the protection of shareholders' rights (Akira Kawamura et al., 2013).

In 2017, corporate governance was defined as the relationship structure and practices that promote transparency and accountability within board of directors to build investor confidence. Such confidence is crucial for fundraising and listing on the stock exchange. However, focusing solely on shareholder interests is no longer sufficient. Shareholders and businesses now expect companies to achieve strong performance and returns, maintain balanced relationships with stakeholders, and possess business agility and resilience to navigate new challenges. These factors are essential for companies to remain competitive and achieve long-term sustainability. To address these expectations, the Corporate Governance Code (“CG Code”) has been developed. The CG Code offers guidelines for boards of directors, positioning them as leaders and regulators of listed companies. The principles outlined in the CG Code integrate the core elements of internationally accepted frameworks, including the G20/OECD Corporate Governance Principles, the Stock Exchange of Thailand’s Principles of Good Corporate Governance, and the Principles of Social and Environmental Responsibility for Business. These principles define the roles and responsibilities of the board of directors, emphasizing their commitment to creating sustainable, long-term value for the company. This value not only benefits the company itself but also extends to shareholders, stakeholders, the capital market, and society as a whole (Stock Exchange of Thailand, 2017).

5. Concepts of Board Structure and Institutional Investors

Institutional investors are often large corporations that play a key role in the development mix, using their financial influence to shape corporate behavior and acting as intermediaries to facilitate members' investments in banks, credit unions, pension funds, insurance companies, hedge funds, venture capital funds, mutual funds, and real estate investment trusts. Institutional investors have significant influence on corporate governance through their voting rights. Their shareholding power is exercised in meetings to guide the organization through advisory board members. Institutional investors can promote good corporate governance practices and hold boards and management accountable.

Institutional investors have a significant role in upholding good governance. Their financial power aims to ensure investments in sound corporate structures and sustainable organizations that create social impact (James Kimani, 2023: The Role of Institutional Investors in Corporate Governance, <https://www.linkedin.com/pulse/role-institutional-investors-corporate-governance>). Institutional investors exert influence on capital markets worldwide. The growing scale of global investment gives them the potential to shape the behavior of investee companies through their due diligence activities (Aggarwal et al., 2011; Gillan and Starks, 2003; Mallin, 2016). The codes of conduct and governance guidelines issued by various institutions in different countries are crucial steps toward fostering better interactions between institutional investors and investee companies. Since these institutions aim to promote positive governance structures (Haxhi et al., 2013; McNulty and Nordberg, 2016), Fama and

Jensen (1983) stated that the corporate board of directors is the primary internal governance mechanism that safeguards the interests of shareholders. Ferreira and Matos (2008) demonstrated that institutional investors play a vital role in effectively monitoring corporate performance, which helps increase firm value by mitigating executives' self-seeking behavior. Sakawa and Watanabe (2020) found that institutional investors have the capacity to strengthen corporate governance mechanisms in a stakeholder-oriented system and contribute to enhancing corporate risk management.

6. The Concept of Board Structure and Corporate Performance

Corporate performance is a measure of a company's ability to achieve its goals and is the result of the interaction between a company's efficiency and effectiveness (Kanakriyah, 2021). Economists view performance as a mechanism that influences the social, economic, and political aspects of a company. To survive in a highly competitive business environment, companies must operate according to performance conditions (Taouab & Issor, 2019). Performance focuses on events that directly affect financial statements. Businesses need to prioritize positive financial performance to sustain the value of their investments. Performance can also serve as a reference and an opportunity for future growth, representing the long-term development of the organization (Yopie & Lim, 2021). Most companies strive to improve their performance in every possible way, aiming to innovate, achieve efficiency, and maintain competitiveness. Competing in a constantly changing environment requires a deep understanding and ongoing assessment of performance. Consequently, the evaluation of corporate performance has been a topic of interest for both management teams and researchers. Moreover, measuring firm performance in today's economic climate remains an important area of study for scholars. Researchers continue to refine methods to measure the concept of performance, and debates about its definition and metrics remain ongoing. Successful companies are crucial for the development of emerging economies, as they serve as indicators of economic, social, and political progress for competitive survival. Today, corporate performance has become a strategically relevant concept. While it is frequently used as a dependent variable in management research, a consensus on its definition and measurement remains elusive in academic literature (Omar Taouab, 2019). The primary drivers of corporate performance can be defined and assessed in terms of profitability, growth, market value, total shareholder return, economic value added, and customer satisfaction, depending on stakeholder expectations (Carroll, 2004).

7. The Concept of Institutional Investors and Corporate Performance

McConnell and Servaes (1990) pointed out that the higher the proportion of institutional shareholders, the higher the Tobin's Q ratio. Additionally, separate studies on domestic institutional shareholders and foreign institutional shareholders both show a positive relationship with corporate performance (Nashier and Gupta, 2016). However, these findings conflict with a study conducted on a sample of companies in Indonesia, which found that institutional shareholders negatively affected corporate performance when measured by

Tobin's Q (Fauzi, Musallam, and Nagu, 2018). Lee and Chuang (2009) examined different types of institutional shareholders and indicated that the proportion of institutional shareholders that are government agencies has a negative relationship with firm performance. In contrast, institutional shareholders that are private sector funds or trusts have a positive relationship with firm performance (Piyanan Nutrujiroj and Sillapaporn Srijunpetch, 2020). Cornett, Marcus, and Tehranian (2003) investigated the relationship between institutional investor participation and the performance of large companies. They found a significant relationship, attributing it to institutional investors' investment experience and access to better financial information. This, in turn, leads to good corporate governance and effective management practices, reducing conflicts of interest and protecting stakeholder interests, which improves operational efficiency. Sahut and Gharbi (2010) examined the relationship between different types of institutional investors and firm performance in France. Firm performance was measured by Tobin's Q, institutional investors were evaluated based on their shareholding proportions, and control variables included firm size and debt. The study found a positive, synergistic relationship between institutional investors and corporate performance. Mahoney and Robert (2007) explored the relationship between corporate social performance (CSP) and financial performance with institutional investors in Canada. Their findings showed that the amount of shareholding by institutional investors was positively associated with corporate social performance.

In Thailand, institutional investors have actively invested in the capital market across various companies, including the Ministry of Finance and the Social Security Office. However, it remains a matter of debate whether institutional shareholders positively impact a firm performance. On the one hand, some studies suggest that institutional shareholders benefit firm performance due to their bargaining power and access to resources, capital, and technology. These advantages enable companies to reduce transaction costs and secure scarce resources, such as labor, raw materials, capital, sales channels, and technology. As a result, these factors enhance the company's competitiveness. On the other hand, there is an argument that institutional shareholders may reduce a company's efficiency because their objectives often focus on social and political value creation rather than maximizing company (Ongore, 2011; Pervan, Pervan, and Todorić, 2012; Yupana Wiwattanakantang, 2001). In particular, companies with a significant proportion of institutional shareholders who are government agencies may be subject to government influence, which can be driven by political interests rather than business efficiency. Such influence might prioritize social objectives over corporate profits (Zeitun and Tian, 2007), ultimately negatively affecting firm performance.

8. The Relationship Between Board Structure, Institutional Investors, and Corporate Performance

Performance is a measure of a company's ability to achieve its goals and is the result of the interaction between the company's efficiency and effectiveness (Kanakriyah, 2021).

Economists view performance as a mechanism that influences the social, economic, and political aspects of a company. In order to thrive in a highly competitive business environment, companies must operate according to specific performance conditions (Taouab & Issor, 2019). Performance primarily focuses on events that directly impact financial statements. Companies need to prioritize strong financial performance to sustain the value of their investments. Additionally, performance serves as a benchmark and opportunity for future growth and represents the long-term development of an organization (Yopie & Lim, 2021). Most companies strive to improve their performance through various means, such as innovation, operational efficiency, and strategic planning. Competing in a continuously changing environment requires a deep understanding of performance metrics and the ability to monitor and adapt strategies accordingly. Therefore, evaluating organizational performance has consistently been a topic of interest for both management teams and researchers.

In addition, measuring firm performance in the current economic environment is an important issue for scholars. Researchers have made significant efforts to define metrics for corporate performance, and an ongoing debate continues regarding its measurement and conceptualization. Successful companies play a crucial role in developing countries, as many economists view them as key drivers of economic, social, and political development. To remain competitive in today's landscape, corporate performance has become a strategically relevant concept. In management research, it is often treated as a dependent variable. Despite its widespread presence in academic literature, there is no consensus on its definition and measurement (Omar Taouab, 2019). The main drivers of corporate performance can be assessed through various indicators, including profitability, growth, market value, total return to shareholders, economic value added, and customer satisfaction, depending on stakeholder expectations (Carroll, 2004).

However, there are many variables that may serve as benchmarks for measuring corporate governance. Some of these mechanisms reflect firm performance by illustrating operational efficiency in terms of economic benefits or financial information. Investors and stakeholders rely on such information to decide whether to maintain their interests in the company. In addition to addressing agency problems, corporate governance also focuses on the responsibilities and functions of the board of directors. The principles of good corporate governance have been refined over time to better define the duties of directors and executives. The Stock Exchange of Thailand has recognized the significance of good corporate governance, with board of directors serving as a crucial force to monitor and evaluate firm performance in alignment with good governance principles, ensuring efficiency, effectiveness, and transparency. This helps build confidence among shareholders, stakeholders, and other relevant parties. This aligns with Fama and Jensen (1983), who stated that the board of directors is a vital internal control mechanism in corporate governance, responsible for overseeing the performance of company representatives (Piphassorn Achawapornwitoon, 2021). Today, corporate governance has expanded to include the interests of various



stakeholders, beyond just business owners. However, most current business management still prioritizes creating value for owners (Piphassorn Achawapornwitoon, 2021). Therefore, a broader approach to corporate governance must also align with the goal of business management to create long-term business value, considering the interests of all stakeholders. Consequently, the structure of the board of directors, as outlined in corporate governance guidelines, aims to ensure transparency and accountability, build investor confidence, and enable the company to adapt to changing business conditions while maintaining positive relationships with surrounding communities. These efforts are intended to support the company's growth and long-term sustainability (Stock Exchange of Thailand, 2017). The study of Iyengar, Land, and Zampelli (2010) highlighted that the composition of board of directors is a crucial governance mechanism. A well-structured board effectively monitors and supervises executive performance, thereby maximizing benefits for shareholders (Piphassorn Achawapornwitoon, 2021).

Conceptual framework

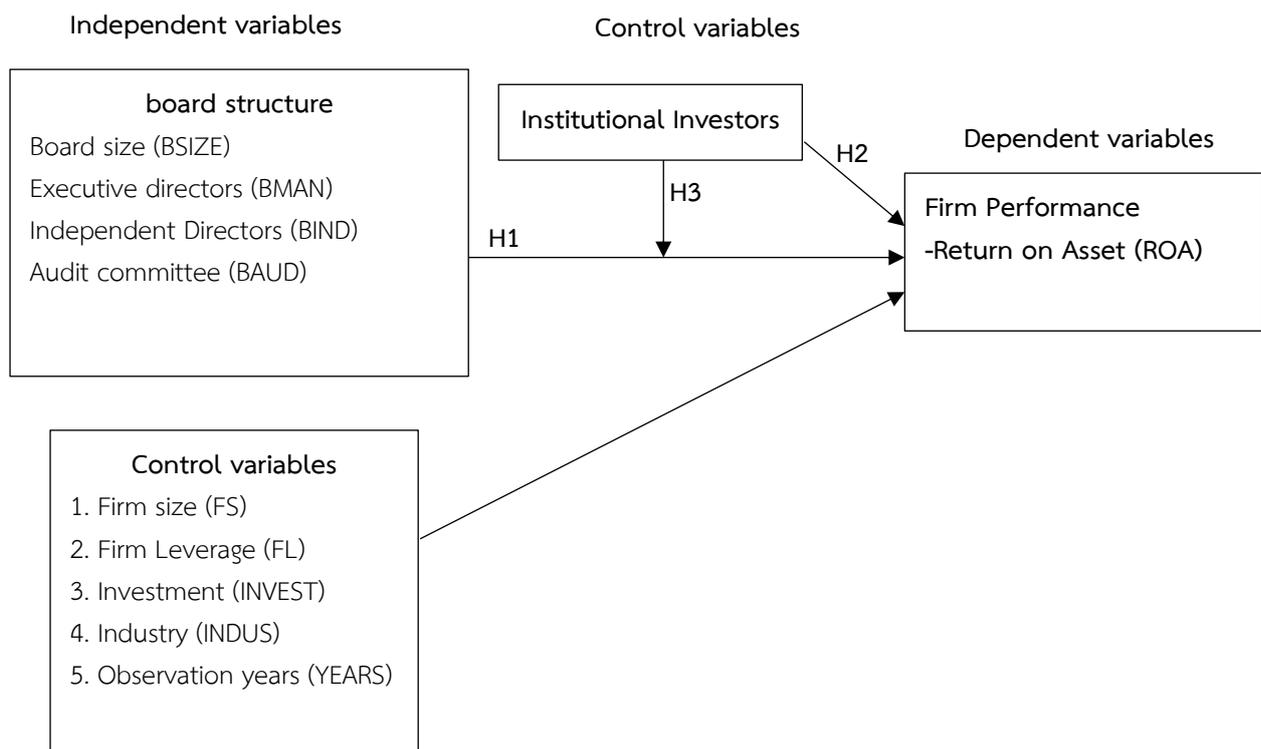


Figure 1 Research Framework

Research Methodology

1. Sample Selection

The sample for this study includes data from companies listed on the Stock Exchange of Thailand (SET) between 2020 and 2022, resulting in a total of 1,148 annual observations.

The selection of the sample focused on ensuring the relevance and accuracy of the data, and therefore, the following companies were excluded:

1.1 Real Estate Mutual Funds and Investment Units: These entities differ significantly from typical companies in terms of management structure and focus primarily on delivering investor returns rather than operational performance.

1.2 Companies Under Bankruptcy Rehabilitation: Companies experiencing financial distress and undergoing rehabilitation as part of the Bankruptcy Act were excluded, as including them could distort the research findings and result in unreliable conclusions.

1.3 Companies at Risk of Delisting: Companies that are eligible for delisting and have been prohibited from trading were also excluded, as it is difficult to obtain complete and accurate data for these companies.

1.4 Financial Sector Companies: Companies within the financial industry group, including banking, finance and securities, as well as insurance and life insurance were not considered. These companies have distinct capital structures and are subject to specific regulations enforced by the Bank of Thailand, which differ from the governance and operational norms of general companies.

Table 1 Number of Samples

Indus * Year Crosstabulation

Count

Industry		Year			Total
		63	64	65	
1	Agriculture and Food	46	46	47	139
2	Resources	46	44	46	136
3	Technology	32	34	35	101
4	Services	84	87	87	258
5	Industrial Goods	61	67	64	192
6	Consumer Goods	27	30	29	86
7	Real Estate and Construction	81	80	75	236
Total		377	388	383	1,148

2. Data Collection

This study examines the influence of institutional investors on the relationship between board structure and firm performance. Specifically, it analyzes the effects of board size (BSIZE), board management (BMAN), the proportion of independent directors (BIND), board of auditors (BAUD), and institutional investors (INST) on firm performance (measured by return on assets, ROA). The analysis focuses on companies listed on the Stock Exchange of Thailand across seven industry groups, using a total of 1,148 annual data points collected from financial statement data in the SETSMART database for the period 2020–2022.

3. Research Tools

This study utilizes secondary data collected from the website www.setsmart.com (Set Marketing Analysis). The data comprises financial statements of companies listed on the Stock Exchange of Thailand during the period 2020–2022.

For the analysis, statistical methods were employed, specifically multiple regression analysis, to test the relationships outlined in the hypotheses. The models used in the study are as follows:

Hypothesis 1

$$ROA_i = \beta_0 + \beta_1 BSIZE + \beta_2 FS_i + \beta_3 FL_i + \beta_4 INVEST_i + \varepsilon_i$$

$$ROA_i = \beta_0 + \beta_1 BMAN + \beta_2 FS_i + \beta_3 FL_i + \beta_4 INVEST_i + \varepsilon_i$$

$$ROA_i = \beta_0 + \beta_1 BIND + \beta_2 FS_i + \beta_3 FL_i + \beta_4 INVEST_i + \varepsilon_i$$

$$ROA_i = \beta_0 + \beta_1 BAUD + \beta_2 FS_i + \beta_3 FL_i + \beta_4 INVEST_i + \varepsilon_i$$

Hypothesis 2

$$ROA_i = \beta_0 + \beta_1 INST + \beta_2 FS_i + \beta_3 FL_i + \beta_4 INVEST_i + \varepsilon_i$$

Hypothesis 3

$$ROA_i = \beta_0 + \beta_1 BSIZE_i + \beta_2 INST_i + (\beta_3 BSIZE_i \times INST_i) + \beta_4 FS_i + \beta_5 FL_i + \beta_6 INVEST_i + \varepsilon_i$$

$$ROA_i = \beta_0 + \beta_1 BMAN_i + \beta_2 INST_i + (\beta_3 BMAN_i \times INST_i) + \beta_4 FS_i + \beta_5 FL_i + \beta_6 INVEST_i + \varepsilon_i$$

$$ROA_i = \beta_0 + \beta_1 BIND_i + \beta_2 INST_i + (\beta_3 BIND_i \times INST_i) + \beta_4 FS_i + \beta_5 FL_i + \beta_6 INVEST_i + \varepsilon_i$$

$$ROA_i = \beta_0 + \beta_1 BAUD_i + \beta_2 INST_i + (\beta_3 BAUD_i \times INST_i) + \beta_4 FS_i + \beta_5 FL_i + \beta_6 INVEST_i + \varepsilon_i$$

Dependent Variables is the variable measuring firm performance: Return on Asset (ROA)

Independent Variables

Board size = BSIZE

Board management = BMAN

Independent directors = BIND

Board of auditors = BAUD

Control Variables

Firm size = FS

Firm Leverage = FL

Investment = INVEST

Industry = INDUS

Observation years = YEARS

4. Variables and variable measurement

Table 2 Variables and variable measurement

Variables	Notation	Measurement/ Description	Sources
<i>Independent Variable</i>			
Board Size	BSIZE	Total number of directors	Pibhassorn Achawapornwitoon, 2021
Board Management	BMAN	Number of board management/Total number of directors	Yut Worachattarn, 2011
Board Independent	BIND	Number of independent directors/Total number of directors	Pipassorn Achawapornwitoon, 2021
Board Audit Committee	BAUD	Number of board of auditors/Total number of directors	Wansiri Prasertsap, 2022
<i>Dependent</i>			
Return on Asset	ROA	EBIT (1 – tax rate) / Total asset	Damodaran, (2014)
<i>Control Variables</i>			
Firm Size	FS	Net of total asset (Natural logarithm)	Amal et al., (2015)
Firm Leverage	FL	Total debt divided by total assets	Amal et al., (2015)
Investment	INVEST	Property, plant and equipment divided by total assets	Boyle and Murphy, (2022)

Data Analysis

1. Descriptive statistics

Table 3 Basic statistics of sample data

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
						Statistic	Std. Error	Statistic	Std. Error
BSIZE	1148	5.00	20.00	9.98	2.43	0.839	0.072	0.522	0.144
BMAN	1148	0.00	42.86	23.10	10.73	-1.207	0.072	0.363	0.144
BIND	1148	33.33	80.00	43.15	9.51	1.022	0.072	0.506	0.144
BAUD	1148	16.67	66.67	32.70	7.56	0.487	0.072	0.497	0.144
MOD_INST	1148	0.03	96.66	12.47	16.13	2.424	0.072	6.059	0.144
lnSIZE (FS)	1148	11.96	21.95	15.89	1.61	0.801	0.072	0.469	0.144
FL	1148	0.01	0.96	0.43	0.21	0.084	0.072	-0.955	0.144
INVEST	1148	0.00	0.96	0.31	0.22	0.539	0.072	-0.431	0.144
ROA	1148	-8.89	27.46	5.48	7.09	0.432	0.072	0.616	0.144

Table 3 presents the results of the basic data study, which assessed data normality using skewness and kurtosis indices. According to Kline (2011), acceptable skewness values range from -3 to +3, while kurtosis values are appropriate between -10 and +10. The Return on Assets (ROA) variable had an average value of 5.48%, a standard deviation of 7.09%, a maximum value of 27.46%, and a minimum value of -8.89%. For Board Structure variables, Board Size (BSIZE) averaged 9.98, with a standard deviation of 2.43, a maximum value of 20.00, and a minimum value of 5.00. Board management (BMAN) averaged 23.10, with a standard deviation of 10.73, a maximum value of 42.86, and a minimum value of 0.00. Board Independence (BIND) averaged 43.15, with a standard deviation of 9.51, a maximum value of 80.00, and a minimum value of 33.33. Board of auditors (BAUD) averaged 32.70, with a standard deviation of 7.56, a maximum value of 66.67, and a minimum value of 16.67. The moderator variable, Institutional Investor (INST), had an average of 12.47, a standard deviation of 16.13, a maximum value of 96.66, and a minimum value of 0.03. For control variables, Firm Size exhibited a non-normal distribution, which was adjusted using the natural logarithm. After this transformation, the average value (lnSIZE) was 15.89 million baht, with a standard deviation of 1.61, a maximum value of 21.95 million baht, and a minimum value of 11.96 million baht. Firm Leverage (FL) averaged 0.43, with a standard deviation of 0.21, a maximum value of 0.96, and a minimum value of 0.01. Lastly, Investment (INVEST) averaged 0.31, with a standard deviation of 0.22, a maximum value of 0.96, and a minimum value of 0.001.

Correlation analysis results

Table 4 Pearson Correlation Coefficient

	Correlations								
	BSIZE	BMAN	BIND	BAUD	MOD_INS	lnSIZE	LEV	INVES	ROA
BSIZE	1								
BMAN	-.083**	1							
BIND	-.218**	-.643**	1						
BAUD	-.870**	-0.034	.291**	1					
MOD_INST	.059*	0.025	-0.042	-.084**	1				
lnSIZE	.445**	-.136**	.102**	-.384**	0.021	1			
LEV	.088**	-0.030	0.048	-.131**	0.031	.434**	1		
INVEST	.141**	-0.018	-0.054	-.158**	-0.013	-0.015	0.006	1	
ROA	-0.023	-0.025	0.040	0.037	0.005	.078**	-.190**	-0.010	1

Note *, **Correlation is significant at the .05 and .01 level

Notes: Board Structure; Board size: BSIZE, Board management: BMAN, Board Independence: BIND, Board of auditors: BAUD. Moderator; Institutional Investor: (INST) lnSIZE: Logarithm of Firm Size (FSIZE), FL: Firm Leverage, INVEST: Investment, Return on asset: ROA.

Table 4 presents the results of the Pearson correlation coefficient analysis for the variables used in this study, indicating the linear associations between them. Positive (“+”) and negative (“-”) signs represent positive and negative correlations, respectively. Tobin’s Q and ROA, the dependent variables, measure the firm performance of companies listed on the SET from 2020 to 2022. The correlation analysis revealed that the highest correlation coefficient was observed for board of auditors (BAUD), with $r = -0.870$, a value exceeding the threshold of 0.70. To address potential multicollinearity arising from the interaction of variables (BAUD * INST), the mean centering method was applied (Kromrey & Foster-Johnson, 1998). Consequently, this study does not face multicollinearity issues, fulfilling a key condition for conducting regression analysis.

Hypothesis Testing Results

Table 5 presents the impact of Board Size (BSIZE) on firm performance, measured by Return on Assets (ROA), and examines the moderating effect of institutional investors.

ROA	β	SE	t-stat.	p-value	95% Confidence Interval	
<i>Model 1: The impact of BSIZE on ROA, and effects of institutional ownership</i>						
Constant	-5.666	2.312	-2.450	0.014*	-10.202	-1.129
BSIZE (H1.1)	-0.319	0.096	-3.308	0.001***	-0.508	-0.130
INST (H2)	0.010	0.013	0.765	0.444	0.015	0.034
BSIZE* INST (H3.1)	0.008	0.005	0.765	0.141	-0.003	0.018
lgSIZE	1.059	0.164	6.455	0.000***	0.737	1.380
LEV	1.078	-0.291	-8.942	0.000***	-11.757	-7.526
INVEST	-0.679	0.984	1.474	0.490	-2.610	1.252
Included industry and time (year) fixed effects, Adjusted R^2 9.60%, F-stat 2.173						
R^2 -change 0.2%, D.W. 1.846						
Notes: t statistics in parentheses, ** $p < .05$, *** $p < .01$; $n=1,148$ for all models.						

From Table 5, the results for hypothesis 1.1 indicate that board structure, specifically board size (BSIZE), has a negative relationship with firm performance (ROA) (p-value < 0.01). For hypothesis 2, it was found that institutional investors (INST) have no significant relationship with firm performance (ROA) (p-value > 0.05). Similarly, hypothesis 3.1 reveals that the interaction between board size and institutional investors (BSIZE*INST) has no statistically significant influence on firm performance (ROA) (p-value > 0.05). This suggests that institutional investors do not act as a moderating variable in the relationship between board size and performance. In other words, whether board size affects firm performance is not dependent on institutional investors. However, the results show that the coefficient (β) shifts from -0.319

to 0.008, indicating that a higher proportion of institutional investors may enhance the credibility of the board of directors, which could positively influence firm performance.

Table 6 The impact of Board Management (BMAN) on firm performance (ROA) and the moderating effect of institutional investors.

ROA	β	SE	t-stat.	p-value	95% Confidence Interval	
<i>Model 1: The impact of BMAN on ROA, and effects of institutional ownership</i>						
Constant	-5.570	2.361	-2.359	0.019**	-10.203	-0.936
BMAN (H1.2)	-0.002	0.019	-0.086	0.932	-0.039	0.036
INST (H2)	0.005	0.013	0.407	0.684	-0.020	0.030
BMAN* INST (H3.2)	0.004	0.001	3.231	0.001***	0.002	0.007
lgSIZE	0.852	0.144	5.900	0.000***	0.568	1.135
LEV	-9.089	1.076	-8.445	0.000***	-11.201	-6.978
INVEST	-1.343	0.975	-1.378	0.169	-3.256	0.570
Included industry and time (year) fixed effects, Adjusted R^2 9.40%, F-stat 10.438***						
R^2 -change 10.5%, D.W. 1.828						
Notes: t statistics in parentheses, ** $p < .05$, *** $p < .01$; $n=1,148$ for all models.						

From Table 6, the results for hypothesis 1.2 indicate that board structure, specifically the proportion of the executive board (BMAN), has no significant relationship with firm performance (ROA) (p -value > 0.05). Similarly, hypothesis 2 shows that institutional investors (INST) also have no significant relationship with firm performance (ROA) (p -value > 0.05). However, the results for hypothesis 3.2 reveal that the interaction between the proportion of the executive board and institutional investors (BMAN*INST) has a statistically significant influence on firm performance (ROA) (p -value < 0.01). This indicates that institutional investors act as a moderating variable in the relationship between the proportion of the executive board and firm performance. The degree to which the proportion of the executive board affects performance depends on the level of institutional investor involvement. Furthermore, the results show that the coefficient (β) shifts from -0.002 to 0.004, suggesting that a higher proportion of institutional investors can enhance the credibility of the executive board. This is likely because individuals on the executive board with relevant knowledge and experience in the company's business operations provide valuable insights to investors, ultimately contributing to improved firm performance.

Table 7 Impact of independent directors (BIND) on firm performance (ROA) and the moderating effect of institutional investors.

ROA	β	SE	t-stat.	p-value	95% Confidence Interval	
<i>Model 1: The impact of BMAN on ROA, and effects of institutional ownership</i>						
Constant	-5.583	2.447	-2.282	0.023**	-10.384	-0.782
BIND (H1.3)	0.012	0.022	0.545	0.586	0.055	0.040
INST (H2)	0.004	0.013	0.286	0.775	0.028	0.005
BIND* INST (H3.3)	-0.006	0.002	-3.772	0.000***	-0.003	-0.095
lgSIZE	0.819	0.143	5.725	0.000***	1.100	0.078
LEV	-9.201	1.072	-8.580	0.000***	-7.097	-0.190
INVEST	-1.263	0.977	-1.292	0.197	0.655	-0.010
Included industry and time (year) fixed effects, Adjusted R^2 10.9%, F-stat 14.225***						
R^2 -change 1.1%, D.W. 1.838						
Notes: t statistics in parentheses, ** $p < .05$, *** $p < .01$; $n=1,148$ for all models.						

From Table 7, the results for hypothesis 1.3 indicate that the structure of the board of independent directors (BIND) has no significant relationship with firm performance (ROA) (p -value > 0.05). Similarly, hypothesis 2 shows that institutional investors (INST) do not significantly impact firm performance (ROA) (p -value > 0.05). However, the results for hypothesis 3.3 reveal that the interaction between the board of independent directors and institutional investors (BIND*INST) has a statistically significant negative influence on firm performance (ROA) (p -value < 0.01). This suggests that institutional investors act as a moderating variable that influences the relationship between independent directors and firm performance. The proportion of independent directors affects performance to varying degrees depending on the level of institutional investor involvement. Additionally, the research findings show that the coefficient (β) changes from 0.012 to -0.006, indicating that a higher or lower proportion of institutional investors does not necessarily enhance the credibility of independent directors. This is because independent directors do not actively engage in company operations and are not employees; instead, they must prioritize the interests of the company and shareholders, ensuring that board members remain independent of management to provide unbiased perspectives on critical decisions.



Table 8 Impact of board of auditors (BAUD) on firm performance (ROA) and the moderating effect of institutional investors.

ROA	β	SE	t-stat.	p-value	95% Confidence Interval	
<i>Model 1: The impact of BMAN on ROA, and effects of institutional ownership</i>						
Constant	-10.321	3.074	-3.357	0.001***	-16.354	-4.289
BAUD (H1.4)	0.085	0.030	2.864	0.004**	0.027	0.144
INST (H2)	0.007	0.013	0.579	0.563	-0.018	0.032
BAUD* INST (H3.4)	-0.004	0.002	-2.479	0.013**	-0.008	-0.001
lgSIZE	0.972	0.156	6.215	0.000***	0.665	1.279
LEV	-9.343	1.073	-8.710	0.000***	-11.448	-7.238
INVEST	-0.795	0.985	-0.807	0.420	-2.728	1.138
Included industry and time (year) fixed effects, Adjusted R^2 10.8%, F-stat 6.144**						
R^2 -change 0.50%, D.W. 1.852						
Notes: t statistics in parentheses, ** $p < .05$, *** $p < .01$; $n=1,148$ for all models.						

From Table 8, the results for hypothesis 1.4 show that the structure of the board of directors, specifically the board of auditors (BAUD), has a positive relationship with firm performance (ROA) (p-value < 0.01). Hypothesis 2 indicates that institutional investors (INST) have no significant relationship with firm performance (ROA) (p-value > 0.05). However, the results for hypothesis 3.4 reveal that the interaction between the board of auditors and institutional investors (BAUD*INST) has a statistically significant negative influence on firm performance (ROA) (p-value < 0.05). This suggests that institutional investors act as a moderating variable that affects the relationship between the board of auditors and firm performance. Additionally, the research findings show that the coefficient (β) changes from 0.085 to -0.004. This indicates that the proportion of institutional investors does not necessarily enhance the credibility of the board of auditors' presence. The audit committee's primary responsibility is to maintain internal controls and ensure the accuracy and effectiveness of financial reporting, making it unreasonable to assume that a higher or lower number of institutional investors would have a greater impact. Nevertheless, the presence of institutional investors and independent directors enhances overall credibility, which, in turn, positively influences firm performance.

Summary and Discussion

1. Summary and Discussion

The study on the influence of institutional investors on the relationship between board structure and firm performance in listed companies on the Stock Exchange of Thailand yielded the following findings. The research results indicate that the board structure, in terms of board size (BSIZE), has a negative relationship with firm performance (ROA). In contrast, the board structure in terms of board of auditors (BAUD) has a positive relationship with firm performance

(ROA). However, the board structure in terms of board management (BMAN) and independent directors (BIND) shows no significant relationship with firm performance (ROA). Additionally, institutional investors (INST) do not have a notable impact on firm performance (ROA).

When testing the influence of moderating variables together with the board structure (BSIZE, BMAN, BIND, BAUD) on firm performance (ROA), it was found that the board structure in terms of board management (BMAN), together with institutional investors, had a statistically significant positive influence on firm performance. Meanwhile, the board structure in terms of independent directors (BIND) and board of auditors (BAUD), combined with institutional investors, showed a statistically significant negative influence on firm performance. These findings align with the research of Cornett, Marcus, and Tehranian (2003), who discovered a significant relationship between institutional investors and the performance of large companies, as institutional investors possess investment experience and access to valuable financial information, which helps protect stakeholders' interests. Sahut and Gharbi (2010) found a significant positive relationship between institutional investors and firm performance, as measured by Tobin's Q. Mahoney and Robert (2007) also observed a positive relationship between the number of shares held by institutional investors and sustainable business operations. Additionally, Junyao Chen et al. (2022) identified that a higher proportion of institutional investors leads to better performance in listed companies.

Board members are often well-acquainted with the operations, culture, and strategic direction of the company. Their involvement can result in more informed decision-making and a quicker response to market changes. When board members collaborate with institutional investors, who typically aim to maximize returns, the alignment of interests can enhance business performance. This collaboration fosters a more proactive governance approach, where directors leverage their operational insights to drive performance while remaining accountable to institutional investors. The results of Adams and Ferreira's (2007) study support this perspective, suggesting that the presence of board members can positively impact firm performance, particularly when institutional investors are involved, as they often endorse strategic initiatives that boost shareholder value. On the other hand, while independent directors (BIND) play a crucial role in overseeing management and ensuring that actions align with shareholders' interests, an excessive number of independent directors can create a disconnect from the company's day-to-day operations. This disconnection may result in slower decision-making and a lack of practical business insights, which can be detrimental in a fast-paced environment. This observation aligns with Yermack (1996), who highlighted that an overabundance of independent directors can impede effective governance and negatively affect performance. When institutional investors are also present, the potential for conflicts or misaligned interests can further exacerbate these issues, making effective collaboration and communication even more critical.

Board of auditors (BAUD) is crucial for financial governance and risk management. However, if the proportion of audit committee members is too high, it can result in an overly

cautious approach, which may hinder innovation and responsiveness to market opportunities. This could explain the negative influence observed when audit committee members are considered together with institutional investors. This finding aligns with research by Bhagat and Bolton (2008), who emphasized that while audit committees are vital for corporate governance, their effectiveness can be compromised if they lack sufficient operational insights from the board.

This study suggests that having a balanced board structure, which includes a significant proportion of board management (BMAN) and institutional investors, tends to enhance business efficiency due to operational expertise and strategic alignment with investors' goals. However, overreliance on board independence (BIND) and board of auditors (BAUD) may result in governance challenges that negatively impact efficiency, particularly when these directors lack critical insights into internal control, management strategies, and financial reporting information. Consequently, the size and composition of the board play a crucial role in effective management, which is consistent with the research of Vafeas (2000), Topal and Dogan (2014), and García Martín and Herrero (2018), who identified a direct relationship between board size and company revenue and return on assets. Conversely, Nuthawut Sabsombat et al. (2020) and Sharifah et al. (2016) found that executive positions are negatively associated with a company's market value, without necessarily ensuring improved firm performance. Therefore, the presence of independent directors should be carefully monitored to create added value for shareholders. Dian (2014), however, argues that there is no definitive research linking firm performance to the composition of the board of directors, as the independence of boards varies significantly in the unique environments of listed companies across different countries. This variation depends on the corporate governance practices that are either suitable or unsuitable for a given organization's specific environment.

However, the role of institutional investors in the Thai stock market in influencing firm performance remains unclear. Therefore, it is possible that increasing the presence of institutional investors and implementing stricter supervision could help improve performance in the future. This finding is consistent with research by Ongore (2011), Pervan, Pervan, and Todoric (2012), and Yupana Wiwattana Kantang (2001), who suggest that some institutional investors focus on long-term investments and do not actively engage in strict oversight of companies. Additionally, the supervision provided by institutional investors in the Thai market may not be robust enough to directly impact firm performance, as these investors often prioritize social and political interests over maximizing corporate profits. In particular, companies with institutional shareholders who are government agencies may be subject to direct government control, which could leverage this influence for political benefits, ultimately detracting from firm performance. This dynamic suggests that the government sometimes prioritizes social benefits over corporate profitability, as noted by Zeitun and Tian (2007).

Limitations of the Study

1. Limitations of the Research

Limited Data: The research may rely on data from a specific period or only focus on companies listed on the Stock Exchange of Thailand, which may not capture changes in market conditions or long-term economic trends.

Governance Variability: Each company has unique governance structures and internal policies, which can affect the measurement of the impact of institutional investors on firm performance and may result in inaccuracies.

Influence of External Factors: Factors such as global economic conditions, changes in laws, and political developments can impact firm performance, making it challenging to determine the true relationship between board structure and performance.

Use of Quantitative Data: A research approach that primarily focuses on quantitative data may lack qualitative insights, limiting the ability to thoroughly analyze institutional investor behavior and the complex interactions that influence firm performance.

Differences Among Institutional Investors: Institutional investors have diverse characteristics and objectives, including short-term and long-term investment goals, which may impact companies in varying ways and were not fully accounted for in this research.

2. Guidelines for Future Research

Expanding the Data Scope: Future research could expand the data period or incorporate data from multiple countries to compare how institutional investors' governance practices and their impact on firm performance vary across different contexts.

Qualitative Analysis: Enhance the qualitative analysis by conducting interviews with corporate governance experts and institutional investors to gain deeper insights into investor behavior, strategic decision-making, and interactions with the board and the company.

Studying the Impact of Different Types of Institutional Investors: Categorize institutional investors into distinct groups, such as short-term, long-term, and fund-based investors, to investigate the varying influences of each type on firm performance.

External Factor Analysis: Examine the effects of additional external factors, such as economic changes, legislative developments, and political situations, to develop a more comprehensive understanding of the relationships at play.

Application of Advanced Analytical Models: Employ more sophisticated statistical models, such as structural equation modeling and process-based governance tests (Hayes, 2013), to analyze the intricate relationships between board structure, institutional investors, and firm performance in greater detail.

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