RELATIONSHIP BETWEEN ESG DISCLOSURE SCORES AND FIRM PERFORMANCE: MODERATING ROLES OF CEO POWER, INSTITUTIONAL OWNERSHIP AND BOARD CHARACTERISTICS

SANSANEE MEEPROM

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY PROGRAM IN BUSINESS ADMINISTRATION
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Name – Surname	Miss Sansanee Meeprom
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Dissertation Advisor	Assistant Professor Supa Tongkong, Ph.D.
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Academic Year	2024

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ABSTRACT

The objectives of this research were to examine: 1) the relationship between the environmental, social and governance (ESG) disclosure scores and firm market-based performance and 2) the moderating roles of CEO power, institutional ownership, and board characteristics on the relationship between ESG disclosure scores and firm market-based performance.

The samples used in this study consisted of 165 companies listed on the Thailand Sustainability Investment (THSI) index in 2022, of which 85 companies were in the sensitive industry group and 80 companies were in the non-sensitive industry group. ESG disclosure scores were collected from the London Stock Exchange Group (LSEG, formerly Refinitiv), whereas other data were collected from the annual reports, financial reporting, and the SET Market Analysis and Reporting Tool (SETSMART) database. Statistical methods used to analyze the data included multiple linear regression and Hayes's regression-based analysis.

The research results revealed the following findings. First, environmental pillar score positively affected firm performance, while ESG combined, social pillar and governance pillar scores did not affect firm performance. Second, non-CEO duality positively moderated the effect of ESG combined, environmental pillar and social pillar scores on firm performance; institutional ownership moderated the effect of environmental pillar and social pillar scores on firm performance; and board size moderated the effect of ESG combined and governance pillar scores on firm performance.

Keywords: ESG activities, CEO duality, institutional ownership, board gender diversity, board size

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Sansanee Meeprom

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CHAPTER 1
INTRODUCTION

1.1 Background and Statement of the Problem

Since early 2020, "sustainability" has become a ubiquitous term in academic literature. The COVID-19 pandemic emerged as a pivotal event, profoundly impacting society, politics, and daily life globally, with far-reaching economic consequences. Concurrently, extreme weather events have increased, further straining various business sectors and causing significant losses for many organizations. Researchers have proposed various strategies for long-term business sustainability, with a focus on Environmental, Social, and Governance (ESG) practices. The ESG framework aims to bolster investor confidence in corporate sustainability (Thaipat Institute, 2020). In response, regulatory bodies, particularly in emerging markets, have been refining rules and guidelines to enhance sustainability reporting. The Stock Exchange of Thailand (SET) has recognized ESG's importance, implementing measures to encourage listed companies to improve their business environment through comprehensive ESG disclosure. These efforts aim to provide executives with clear sustainability objectives and equip investors with sufficient information for decision-making, ultimately fostering a sustainable economy.

Traditionally, businesses have been established with the primary goal of maximizing wealth and continuously increasing firm value (Salvatore, 2005). For public companies, firm performance is often gauged by investor perceptions, typically reflected in stock prices. These prices are viewed as indicators of a company's total equity value. Tobin's Q ratio, which compares market valuation to intrinsic value or equity book value, has gained recognition as an effective measure of firm value. Researchers have long sought to identify the key variables influencing firm performance, aiming to pinpoint factors that should be maintained and developed to enhance it.

Recently, stock exchange regulators have placed increased emphasis on the disclosure of critical information by listed companies, with ESG reporting becoming a key requirement. Numerous studies have highlighted ESG's significance for various stakeholders, including investors, governments, and regulators. ESG is increasingly viewed as an integral part of corporate strategy, potentially exerting a significant impact

on firm performance (Aouadi & Marsat, 2018; Nekhili et al., 2017; Aboud & Diab, 2018). However, research examining the relationship between ESG and firm value has yielded inconclusive results (Li et al., 2023).

While many studies have explored direct associations between board characteristics (such as intensity, size, and independence) and firm value, these relationships may be oversimplified. Firm value is influenced by the board's power, duties, and responsibilities, which include setting strategies, policies, and objectives to guide management and employees. Without effective board governance, companies may struggle to achieve their goals and secure their future.

In the capitalist paradigm, shareholders hold a central role in listed firms, wielding the authority to elect board members. Additionally, research has shown that institutional investors, who closely scrutinize firm performance, play a crucial role in identifying successful companies for investment.

Given these considerations, this research aims to investigate the relationship between ESG and firm performance, with a particular focus on the moderating effects of CEO power, board characteristics, and institutional ownership on this relationship.

1.2 Research Problem and Questions

As Environmental, Social, and Governance (ESG) considerations become increasingly central to corporate strategy and investor decision-making, it is crucial to understand their impact on firm performance. However, this relationship is likely influenced by various corporate governance factors. This study seeks to address a gap in current research by examining not only the direct effect of ESG disclosure on firm performance but also how this relationship is moderated by key governance elements. The following research problems and questions have been formulated to guide this investigation:

1.2.1 Research Problem

What is the impact of ESG disclosure scores on firm performance, and how do factors such as CEO power, institutional ownership, and board characteristics influence this relationship?

1.2.2 Research Questions

1) Do ESG disclosure scores affect firm performance?

2) Does CEO power moderate the effect of ESG disclosure scores on firm performance and how?

3) Does institutional ownership moderate the effect of ESG disclosure scores on firm performance and how?

4) Do board characteristics moderate the effect of ESG disclosure scores on firm performance and how?

1.3 Purpose of Research

The purposes of this study are:

1.3.1 to investigate the relationship between ESG disclosure scores and firm performance.

1.3.2 to examine the moderating role of CEO power on the effect of ESG disclosure scores on firm performance.

1.3.3 to examine the moderating role of institutional ownership on the effect of ESG disclosure scores on firm performance; and

1.3.4 to examine the moderating effect of board characteristics on the effect of ESG disclosure scores on firm performance.

1.4 Hypotheses

Hypothesis 1: ESG disclosure scores affect firm performance.

H_{1a}: ESG combined score has a positive effect on firm performance.

H_{1b}: Environmental score has a positive effect on firm performance.

H_{1c}: Social score has a positive effect on firm performance.

H_{1d}: Governance score has a positive effect on firm performance.

Hypothesis 2: CEO power moderates the effect of ESG disclosure scores on firm performance.

H2a: CEO power moderates the effect of ESG combined score on firm performance.

H2a$_1$: CEO duality moderates the effect of ESG combined score on firm performance.

H2a$_2$: CEO skill moderates the effect of ESG combined score on firm performance.

H2b: CEO power moderates the effect of Environmental score on firm performance.

H2b$_1$: CEO duality moderates the effect of Environmental score on firm performance.

H2b$_2$: CEO skill moderates the effect of Environmental score on firm performance.

H2c: CEO power moderates the effect of social score on firm performance.

H2c$_1$: CEO duality moderates the effect of social score on firm performance.

H2c$_2$: CEO skill moderates the effect of social score on firm performance.

H2d: CEO power moderates the effect of Governance score on firm performance.

H2d$_1$: CEO duality moderates the effect of Governance score on firm performance.

H2d$_2$: CEO skill moderates the effect of Governance score on firm performance.

Hypothesis 3: Institutional ownership moderates the effect of ESG disclosure scores on firm performance.

H3a: Institutional ownership moderates the effect of ESG combined score on firm performance.

H3b: Institutional ownership moderates the effect of Environmental score on firm performance.

H3c: Institutional ownership moderates the effect of Social score on firm performance.

H3d: Institutional ownership moderates the effect of Governance score on firm performance.

Hypothesis 4: Board Characteristics moderate the effect of ESG disclosure scores on firm performance.

H4a: Board Characteristics moderate the effect of ESG combined score on firm performance.

H4a$_1$: Board size moderates the effect of ESG combined score on firm performance.

H4a$_2$: Board gender moderates the effect of ESG combined score on firm performance.

H4b: Board Characteristics moderate the effect of Environmental score on firm performance.

H4b$_1$: Board size moderates the effect of Environmental score on firm performance.

H4b$_2$: Board gender moderates the effect of Environmental score on firm performance.

H4c: Board Characteristics moderate the effect of social score on firm performance.

H4c$_1$: Board size moderates the effect of social score on firm performance.

H4c$_2$: Board gender moderates the effect of social score on firm performance.

H4d: Board Characteristics moderate the effect of Governance score on firm performance.

H4d$_1$: Board size moderates the effect of Governance score on firm performance.

H4d$_2$: Board gender moderates the effect of Governance score on firm performance.

1.5 Definitions of Specific Terms

The definitions of specific terms and phases in this research are as follows:

ESG disclosure scores refers to a disclosure score consisting of ESG combined score, Environmental Pillar score, Social Pillar score, and Governance Pillar score.

ESG combined score refers to overall ESG score, which is the sum of the Environmental Pillar, Social Pillar and Governance Pillar scores of Thai listed companies by Refinitiv.

CEO power refers to CEO capability to manage companies, including CEO duality and CEO skill.

CEO duality refers to the company's CEO also serves as chairman of the board, or that the CEO and chairman of the board are the same person.

CEO skill refers to the CEO having obtained educational certificates in finance and legal studies.

Institutional ownership refers to percentage of the total number of shares owned by institutions to the total number of shares outstanding.

Board characteristics refer to the feature of the board, including board gender diversity and board size.

Board gender refers to gender diversity of the board, that is measured by the ratio of the number of female directors to total number of directors.

Board size refers to the total number of board members.

Firm performance refers to market-based firm performance, which is measured by the Tobin's Q ratio.

Tobin's Q ratio refers to the ratio between the market value of common equity plus book value of liabilities with the book value of total assets at the end of the fiscal year.

Firm size refers to the natural logarithm of total asset.

Leverage refers to the ratio of total debt to total equity.

Auditor type refers to which is the auditor who plays the significant role in monitoring suspicious behaviors of executives, these auditors are operating in Big-4 sized audit firm comprised Price Waterhouse Coopers, Emst &Young, Deloitte, and Touche and KPMG.

Industry refers to a dummy variable to distinguish ESG sensitive industry from non-sensitive.

1.6 Conceptual Framework

Independent Variable **Moderating Variable** **Dependent Variable**

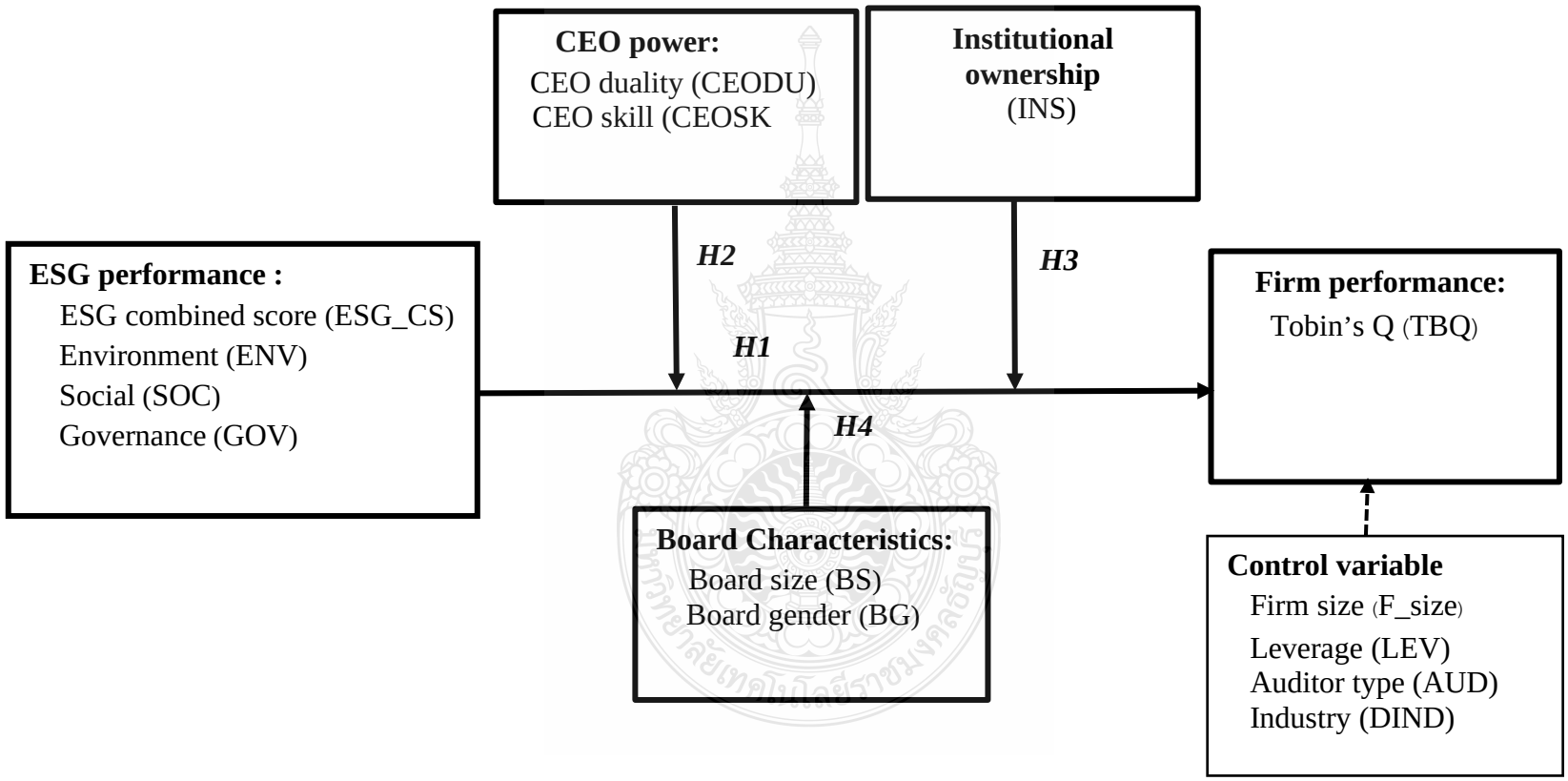

Figure 1.1 Conceptual framework

1.7 Significance of the Study

This research integrates and expands upon several theoretical frameworks, primarily stakeholder theory and agency theory. While agency theory concentrates on the representatives of business owners, stakeholder theory broadens the focus to encompass ethical corporate conduct that considers multiple stakeholders. This theoretical foundation underpins our examination of how corporate boards balance various interests in their decision-making processes.

The present study investigates into the relationship between Environmental, Social, and Governance (ESG) sustainability disclosures and financial performance offers substantial academic and practical value for several reasons:

1.7.1 This study provides robust empirical evidence on corporate sustainability disclosure practices, utilizing ESG as a comprehensive framework. By employing advanced multiple regression models, we elucidate the complex interplay between sustainability information disclosure, CEO influence, board composition, institutional investor presence, and market-based financial indicators.

1.7.2 As ESG sustainability reporting gains prominence in fostering responsible business practices, it serves as a crucial communication tool for companies to demonstrate their commitment to environmental protection, social responsibility, and effective governance. Our findings will help investors, policymakers, and other stakeholders assess the impact of sustainability initiatives on corporate success and value creation.

1.7.3 This research contributes significantly to the ongoing dialogue surrounding ESG standard regulation, particularly in the context of the Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand (SET). Our findings may inform future policy decisions and reporting requirements.

1.7.4 The outcomes of this study provide a strong foundation for governments to refine and strengthen the legislative landscape governing ESG sustainability reporting, potentially leading to more standardized and comprehensive disclosure practices.

1.7.5 With ESG factors increasingly influencing investment decisions, our research offers valuable perspectives on the potential financial advantages of incorporating sustainability practices into business strategies. This information is crucial

for investors seeking to align their portfolios with both financial performance and sustainability goals.

By addressing these key areas, this study aims to bridge existing knowledge gaps and provide actionable insights for both academic and practitioner communities in the realm of ESG disclosure and corporate performance.

CHAPTER 2
REVIEW OF THE LITERATURE

This chapter reviews the literature on Environmental, Social, and Governance (ESG) disclosure, firm performance, and the moderating roles of CEO power, institutional ownership, and board characteristics. It outlines the development of ESG concepts and their importance in current business practices. The chapter examines the theoretical foundations of Upper Echelon Theory, Stakeholder Theory, and Agency Theory. It then discusses ESG measures and the key concepts of the study. By analyzing existing research, this review identifies gaps in current knowledge and provides the basis for the research questions and hypotheses. This chapter sets the context for the study's methodology, analysis, and discussion in subsequent chapters.

2.1 The History of Environmental Social and Governance

The objective of this literature review is to provide a comprehensive overview of the concepts of Environment, Social, and Governance (ESG), as well as CEO power, institutional ownership, and board characteristics, and their impact on firm performance. In recent years, these topics have gained significant attention across various disciplines, including accounting, due to growing concerns surrounding environmental issues such as air pollution, water pollution, waste management, resource depletion, and climate change.

The concept of "Environmental, Social, and Corporate Governance" (ESG) has been developed as an extension of the traditional concept of "Corporate Governance." While Corporate Governance primarily emphasizes the structure and practices that ensure effective management and accountability within a company, the ESG framework expands this scope to incorporate broader considerations of social and environmental responsibility. Albuqerque et al. (2020) argue that the integration of ESG factors enables companies to proactively address and manage risks systematically. They assert that companies actively engaged in ESG practices are better equipped to mitigate potential risks and vulnerabilities. This viewpoint is supported by the findings of Hoepner et al. (2018), who demonstrate that active participation in ESG initiatives contributes to a reduction in negative risks for companies. By incorporating ESG considerations into their decision-making processes, companies can

enhance their resilience and sustainability by identifying and addressing potential risks related to environmental, social, and governance factors.

ESG recognizes that businesses have a responsibility not only to their shareholders but also to society and the environment in which they operate. This concept acknowledges the interconnectedness between a company's financial performance, its impact on society, and its environmental footprint. By integrating ESG principles into their operations, companies can strive for sustainable and responsible business practices that go beyond mere financial gains. This broader perspective reflects the growing recognition of the need to address social and environmental issues alongside traditional corporate governance concerns.

The general public expects companies to demonstrate their commitment to ESG practices. In response to this demand, numerous researchers have conducted studies in this field over the past two years, aiming to enhance our understanding and offer recommendations for sustainable development. This chapter's literature review encompasses various aspects, including Environmental, Social, and Governance dimensions, ownership structure, CEO power, firm performance, the specific context of the Stock Exchange of Thailand, previous relevant studies conducted in this area, and a concluding summary. By examining the existing literature, this review aims to provide valuable insights and contribute to the ongoing discourse on ESG, CEO power, institutional ownership, board characteristics, and their implications for firm performance.

Consideration of ESG and climate variables is not a new notion for investors, but it is set to become even more significant in light of rising legislation, transparency expectations, and a constant drive for standards. The trends mentioned here, as well as in our broader context, are already affecting society and hint at the risks and possibilities that businesses and investors may encounter in the coming years. Understanding them is the first step toward determining the potential impact they may have on investment portfolios. During the global financial crisis of 2008, the divergent fates of banks became apparent, with some managing to weather the storm and even achieve success, while others faltered and collapsed. Notably, banks that prioritized social, environmental, and governance considerations were found to have thrived during this tumultuous period (Carrese, P. 2016). Factors such as environmental health and safety, pollution levels, poverty rates, social and political instability, as well as the demand for direct foreign investment, all warrant careful attention and assessment (Chang et

al., 2019). It is noteworthy that both companies and investors are increasingly recognizing the importance of integrating ESG issues into their decision-making processes (Eccles & Youmans, 2015).

The influence of ESG performance on firm value and profitability has been a subject of considerable scholarly and business research over the years. Initially, much of the research in this domain focused on the impact of corporate governance on stock price performance. However, as concerns surrounding climate change, the circular economy, and biodiversity have gained prominence, studies have emerged that explore the relationship between environmental performance and stock price performance. Moreover, with the onset of the COVID-19 pandemic and the subsequent global health crisis, researchers have increasingly directed their attention to the influence of changing demographics and social issues on stock returns. Of particular interest are factors related to health, safety, and wellbeing, as well as human capital management issues such as employee satisfaction, diversity, and inclusion.

As a result, numerous scholars have conducted investigations to examine the connection between ESG factors and the financial performance of firms. While recent studies have predominantly yielded positive findings, there exists a body of literature comprising papers with negative results that align with the tenets of shareholder theory, wherein the primary objective of a firm is to maximize shareholder profit. The examination of this ongoing debate provides valuable insights. The utilization of our extensive dataset, encompassing diverse geographical regions and incorporating up-to-date ESG scores, facilitates the undertaking of a rigorous analysis. It is important to note that the accurate measurement of ESG performance presents a significant challenge in this field of research.

2.2 Theoretical Foundations

2.2.1 Theoretical Framework

The literature on the relationship between ESG disclosure and firm performance often draws on three theoretical perspectives: Upper Echelon Theory, Stakeholder Theory, and Agency Theory. In this section, we will discuss each of these theories, applying them to develop our hypotheses and interpret the empirical findings.

2.2.1.1 Upper Echelon Theory

Hambrick and Mason's (1984) Upper Echelon Theory offers a comprehensive framework for understanding the connection between organizational outcomes and leadership characteristics. This influential theory, which has been cited over 10,000 times, proposes that an organization's past performance, operational efficiency, and board attributes can forecast future organizational results. The theory emphasizes the critical role of board members' traits, such as expertise, professional background, educational attainment, age, gender, and individual personality traits, in determining corporate performance (Plöckinger et al., 2016; Tulung & Ramdani, 2016). It suggests that a board with diverse fundamental characteristics can substantially influence both firm performance and long-term sustainability.

Empirical research has provided support for the Upper Echelon Theory by examining the links between board characteristics and organizational performance. For example, Lee et al. (2018) demonstrated that highly educated senior CEOs tend to offer enhanced stakeholder support. Furthermore, Carpenter et al. (2004) highlighted the need for adaptive leadership strategies in response to internal and external pressures on organizational operations. These insights underscore the importance of board guidance in shaping CEO decisions and implementing effective business strategies.

Theory also emphasizes the significance of executive responsibilities in organizational success. Tasks such as articulating the company's vision, establishing objectives, and formulating strategies are crucial for fostering growth and ensuring long-term sustainability. By integrating these leadership characteristics into the decision-making process, the Upper Echelon Theory underscores how board composition plays a pivotal role in shaping a firm's strategic direction and overall performance.

When applied to ESG disclosure and firm performance, the Upper Echelon Theory suggests that the attributes and makeup of the board and top management team can significantly influence a company's approach to ESG matters. A board characterized by diverse knowledge, experiences, and backgrounds may be more inclined to prioritize ESG considerations and engage in thorough ESG reporting. This approach can potentially enhance firm performance, particularly as stakeholders increasingly value transparency and sustainable practices.

2.2.1.2 Stakeholder Theory

The concept of stakeholder theory can be traced back to Barnard's 1938 work, which proposed that management should consider the interests of all parties connected to their organization. This idea was later expanded by Freeman (2010), who advocated creating value for all groups impacted by an organization's activities. These groups include not only shareholders but also employees, customers, suppliers, local communities, and even the environment.

Stakeholders are broadly defined as any individuals or groups who can affect or are affected by an organization's goals and operations. This definition, supported by scholars, emphasizes the wide-ranging impact of organizational decisions (Weber et al.2012).

The theory posits that organizations have a responsibility to treat all stakeholders fairly, with due consideration for human rights and environmental issues (Freeman, Wicks, & Parmar, 2004). It suggests that by addressing the needs of all stakeholders, companies can enhance their performance and ensure long-term viability.

Freeman, Harrison, and Zyglidopoulos (2018) offer a classification of stakeholders into two categories: primary and secondary. Primary stakeholders are those directly essential to the organization's operations, such as customers and employees. Secondary stakeholders, while not directly involved in the organization's core activities, can still exert significant influence, and include entities like government regulators and advocacy groups.

In the context of ESG disclosure and corporate performance, stakeholder theory supports the practice of comprehensive ESG reporting. This approach aims to address the diverse concerns of various stakeholder groups. By offering transparent and pertinent ESG data, companies can foster trust and establish legitimacy with their stakeholders. This, in turn, may contribute to improved financial outcomes and sustain success over time. The theory underscores the importance of balancing the varied interests of different stakeholder groups when formulating strategies related to ESG initiatives and disclosures.

2.2.1.3 Agency Theory

Agency theory, introduced by Jensen and Meckling in 1976, explores the dynamics between company owners (principals) and executives (agents). This framework addresses the delegation of authority from owners to managers, who are entrusted with leveraging their expertise to drive organizational success and generate returns.

The theory recognizes that business proprietors often lack the specific knowledge or skills to directly manage their enterprises. Consequently, they delegate operational control to appointed managers. This arrangement, however, can lead to potential conflicts of interest, as agents may not always act in perfect alignment with the principal's objectives.

In corporate governance, agency theory underscores the importance of managerial accountability. It emphasizes the need for agents to oversee business operations responsibly, ensuring efficiency, integrity, and transparency while actively preventing corrupt practices.

When applied to ESG disclosure and corporate performance, agency theory highlights potential disparities in motivations between managers and shareholders regarding sustainability initiatives. Executives might prioritize short-term financial metrics, whereas shareholders could value long-term sustainability practices that mitigate risks and bolster corporate reputation.

To address these potential misalignments, agency theory advocates for robust corporate governance structures. These may include enhanced board supervision, carefully designed incentive programs, and transparent reporting mechanisms. Such measures aim to motivate managers to give due consideration to ESG factors and provide comprehensive sustainability disclosures, thereby better aligning their actions with the long-term interests of shareholders and other stakeholders.

2.3 Environment, Social, and Governance

2.3.1 Environment, Social, and Governance Development in Thailand

The concept of Environment, Social, and Governance (ESG) has gained significant traction in Thailand's corporate landscape. These factors now play a crucial role in shaping business strategies and decision-making processes. Research suggests that

a strong ESG commitment can improve relationships between companies, government bodies, and stakeholder communities (Landi et al., 2020). This improved communication can lead to better sustainable development practices, more accurate analyst forecasts, and positive impacts on various corporate metrics including financial performance, company value, and reputation.

In the Thai context, the Stock Exchange of Thailand (SET) has mandated ESG reporting for listed companies since 2015. This requirement aims to enhance transparency and accountability in companies' environmental, social, and governance practices. By including ESG information in annual reports, the SET seeks to provide investors and stakeholders with a more comprehensive understanding of companies' sustainability efforts, enabling more informed decision-making.

The SET has embraced the Global Reporting Initiative (GRI) Standard Guidelines as a framework for assessing the long-term economic, social, and environmental performance of listed entities. This adoption reflects the SET's commitment to integrating sustainable development principles into corporate reporting practices. The GRI Standard offers a comprehensive set of guidelines that allow companies to effectively communicate their sustainability initiatives, promoting transparency and comparability across different organizations.

The evolution of ESG practices in Thailand can be traced back to 2006, when the Thailand Institute of Directors introduced corporate governance concepts for listed firms in response to the Tom Yum Goong Financial Crisis. Initially, ESG reporting was voluntary under the Securities and Exchange Commission (SEC) guidelines. A significant shift occurred in 2013 when Corporate Social Responsibility (CSR) practices evolved from post-process to in-process approaches, supporting ongoing sustainable development. Since 2015, the ESG concept has integrated corporate governance and social responsibility, guided by the GRI Standard Version Guidelines.

Thailand’s approach to ESG is uniquely influenced by the Sufficiency Economic Philosophy (SEP), a principle articulated by His Majesty King Bhumibol Adulyadej. The SEP serves as a guiding framework for CSR and ESG practices in Thailand, promoting sustainable development among Thai corporations (Suttipun & Arwae, 2020). This philosophy aims to balance economic, social, and environmental

considerations to foster long-term corporate growth (Suttipun & Saefu, 2017). The SEP framework comprises three core principles - moderation, rationality, and self-immunity - along with two prerequisites - knowledge and morality - which align closely with ESG principles.

Since 2015, when the SET began actively supporting ESG performance, sustainability reporting has become an integral part of corporate development strategies. The SET has recognized numerous companies as Thailand Sustainable Investment (THSI) firms based on their ESG performance. Additionally, the Thaipat organization, operating under the SET, has developed the Thaipat ESG Index to help investors compare investment returns and other relevant data.

ESG performance in Thailand is evaluated across eleven points within the three key dimensions of environmental, social, and governance factors. The environmental aspect focuses on resource management, including energy, water, waste, and greenhouse gas emissions. The social dimension encompasses fair human resource practices, occupational health and safety, community relations, and social development. The governance dimension addresses corporate policies, operational transparency, anti-corruption measures, stakeholder protection, risk management, supply chain oversight, and innovation.

ESG performance and disclosure also play a crucial role in credit valuations, helping financial institutions assess risks associated with factors such as climate change, labor policies, and corporate governance. This information aids in evaluating long-term corporate resilience and making informed lending decisions.

The regulatory framework for ESG in Thailand is primarily overseen by the Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand (SET). The SEC, established in 1992, functions as an independent regulatory body supervising both primary and secondary markets. To promote market transparency and accountability, the Supervisory Board has implemented comprehensive guidelines for ESG disclosure, outlined in the annual registration statement (Form 56-1) and One report, effective since January 2014.

The Thaipat Institute, founded in 1999, has emerged as a key player in advancing ESG practices in Thailand. As a GRI Certified Training Partner and data

partner, the institute has developed the “Integrated ESG Reporting Framework.” This framework provides Thai-listed companies with a structured approach to ESG reporting that aligns with both local regulatory requirements and international sustainability reporting standards.

2.3.2 Concepts of ESG and ESG Score

The ESG concept has emerged as an extension of the “Sustainable Development Concept,” which recognizes that a narrow focus solely on maximizing profits without considering social responsibility may encounter resistance from stakeholders, including investors and related parties. Consequently, the ESG concept has gained significance in contemporary investment practices. It is rooted in the belief that investing in ethically responsible businesses yields sustainable and favorable long-term returns. ESG principles strive to strike a balance between pursuing short-term objectives and creating a positive impact on the environment and society to foster long-term growth. The concept encompasses three key responsibilities: environmental, social, and governance (Thaipat Institute, 2020).

1) Environment: This aspect refers to a business having policies and processes in place to manage environmental problems efficiently and effectively. It also involves the restoration of nature affected by business operations.

2) Social: The social dimension of ESG pertains to a business having policies to manage human resources fairly and equally. It involves continuously and qualitatively developing employees, supporting suppliers to treat workers fairly, and providing opportunities for sustainable growth in related communities.

3) Corporate Governance: This aspect refers to the good corporate governance of a company. It involves efficient and transparent management, verifiable anti-corruption measures, and taking into account all stakeholders.

Good ESG practices are believed to lead to added value and reduce risks for businesses. Companies that prioritize ESG considerations are more likely to attract socially conscious investors and customers, enhance their reputation, and mitigate potential risks associated with environmental, social, and governance issues. Moreover, research has shown that companies with strong ESG performance tend to have better financial performance and lower volatility compared to their peers.

The ESG score is a quantitative measure that assesses a company's performance in terms of environmental, social, and governance factors. It provides investors and stakeholders with a standardized way to evaluate and compare companies based on their ESG practices. ESG scores are typically calculated by specialized rating agencies or data providers, such as MSCI, Sustainalytics, and Thomson Reuters, using a combination of publicly available information, company disclosures, and proprietary methodologies.

The calculation of ESG scores involves assessing a company's performance across a range of ESG indicators, such as greenhouse gas emissions, labor practices, board diversity, and anti-corruption policies. The scores are usually presented on a scale, with higher scores indicating better ESG performance. Investors and asset managers increasingly use ESG scores to integrate ESG considerations into their investment decision-making processes and to construct ESG-themed investment products, such as sustainable mutual funds and exchange-traded funds (ETFs).

However, it is important to note that the ESG scoring methodologies used by different providers can vary, leading to inconsistencies and challenges in comparing ESG scores across different sources. Additionally, the reliance on publicly available information and company disclosures may not always capture the full extent of a company's ESG performance, particularly in cases where there is limited transparency or reporting. Despite these limitations, ESG scores remain a widely used tool for assessing and comparing companies' ESG performance and have become an important consideration for investors and stakeholders in the era of sustainable investing.

2.3.3 Introduction to ESG

In recent years, there has been a growing recognition of the importance of environmental, social, and governance (ESG) considerations in investment decisions among securities regulators and trading exchanges worldwide. The three pillars of ESG (shown in Table 2.1) – environment, social responsibility, and governance – encompass a wide range of issues that companies must address to ensure sustainable and responsible business practices.

Table 2.1 ESG Pillars with indicative constituents

E (Environment)	S (Social)	G (Governance)
Climate Change	Human Rights	Board Independence
Carbon Emission	Labour Standards	Board Diversity
Pollution	Poverty	Transparency
Resource Erosion	Equal Health Opportunities	Share Holder's Participation
Biodiversity	Equal Education Opportunities	Employee Wellness
Green Coverage	Social Security	Equal Opportunity

The concept of sustainable development, first introduced by the World Commission on Environment and Development in 1987, emphasizes the importance of meeting the needs of the present without compromising the ability of future generations to meet their own needs. In line with this concept, the integration of ESG factors into investment decisions has gained traction, with asset managers explicitly considering ESG risks and opportunities in their financial analysis and investment processes.

The increasing focus on ESG has been driven by several factors, including the Paris Climate Agreement and the United Nations Sustainable Development Goals (SDGs) adopted in 2015. These global initiatives have catalyzed the adoption and monitoring of sustainable corporate practices, encouraging companies to view ESG policies and issues as an integral part of risk management, distinct from corporate social responsibility (CSR) efforts.

The United Nations Principles for Responsible Investment (UN PRI), launched in 2007, is another notable initiative that has contributed to the growing awareness of ESG among investors and companies. The UN PRI provides a framework for incorporating ESG factors into investment decision-making and ownership practices, to enhance long-term returns and align investment activities with the broader interests of society.

To assess and compare companies' ESG performance, various methods and measures have been developed. Hooks and van Staden (2011) examined the measurement of reporting quantity and quality, introducing a novel measure called the "quality score per sentence" that accounts for variations in the quality of disclosures between companies.

Their research highlights the importance of considering both the quantity and quality of ESG disclosures when evaluating companies' sustainability practices.

The disclosure of ESG information can be either obligatory or voluntary. Obligatory disclosure refers to the information that companies are required to disclose in a specific format, to a particular audience, and within specified timeframes. Voluntary disclosure, on the other hand, encompasses information that goes beyond mandatory requirements, reflecting management's independent choice regarding the information that should be disclosed and its relevance to stakeholders for decision-making purposes.

Empirical evidence from banks in emerging markets suggests that there is a positive association between environmental efficiency and financial performance, while carbon emissions are negatively linked to business outcomes. The social pillar of ESG has also been found to have a positive influence on financial performance. However, the relationship between corporate governance and profitability has yielded mixed results, with some studies finding a positive impact and others indicating no significant association.

To facilitate the measurement and comparison of companies' ESG performance, various institutions have developed ESG scoring systems and sustainability indices. In Thailand, the Stock Exchange of Thailand (SET) plays a key role in promoting sustainable investments through initiatives such as the Thailand Sustainability Investment, which evaluates the sustainability performance of companies operating in the country. Globally, indices like the Dow Jones Sustainability Indexes (DJSI) provide a framework for assessing and benchmarking the ESG practices of businesses worldwide, promoting greater transparency and accountability in sustainable investing.

The study employed ESG scores derived from the Thomson Reuters Eikon database, considered a reliable and standardized source of data. To ensure accuracy and minimize bias, the scoring process is conducted by a central agency, mitigating potential discrepancies. The ESG scores provided by the Thomson Reuters database are determined through expert-weighted analysis, taking into account 178 indicators and assigning approximately 400 points. The overall ESG score ranges from 0 to 100, reflecting the aggregated performance of companies across environmental, social, and corporate governance dimensions.

The application of ESG principles and criteria has been observed to have a positive impact on the returns of investments in individual securities. Extensive research and empirical evidence support the concept that integrating ESG factors into investment decisions leads to good financial results. By considering environmental factors such as carbon emissions and resource management, social factors such as labor practices and community engagement, and governance factors such as board composition and executive compensation, investors can assess the overall sustainability and long-term viability of companies.

This holistic approach to investment analysis not only aligns with responsible and ethical investing practices but also contributes to enhanced financial performance. ESG integration has been shown to improve risk management, uncover new business opportunities, and promote long-term value generation for investors. As a result, the incorporation of ESG principles and criteria into investment portfolios is increasingly recognized as an effective strategy for achieving both financial returns and sustainable impact.

The prevailing empirical evidence consistently demonstrates that companies exhibiting higher levels of ESG virtuousness tend to outperform their less virtuous counterparts in terms of equity performance. Despite the substantial increase in responsible investing in recent years, including the heightened interest during the COVID-19 crisis in 2020, the question of whether incorporating ESG factors yields financial benefits for shareholders, commonly referred to as the "doing good is good for investors" proposition, remains a topic of vigorous debate among scholars and practitioners (Matos, 2020).

2.4 ESG Measures

The growing prominence of sustainability in the business world has led to the development of various frameworks and tools to assess companies' Environmental, Social, and Governance (ESG) performance. These measures aim to provide investors, regulators, and other stakeholders with standardized metrics to evaluate a company's sustainability practices and their potential impact on financial outcomes.

Sustainability, as a concept, is closely tied to sustainable development, which seeks to meet present needs without compromising future generations' ability to meet their own. This principle has become increasingly crucial in corporate strategy, with companies recognizing the importance of balancing their environmental, social, and economic impacts.

Table 2.2 presents an overview of prominent sustainability assessment frameworks, including the ESG BOOK, Dow Jones Sustainability Index (DJSI), Moody's ESG Solutions, MSCI, Refinitiv, S&P Global, SET THSI Index, and Thailand Sustainability Investment (THSI). These frameworks evaluate companies based on their ESG practices, generating scores and rankings to facilitate informed investment decisions.

Table 2.2 ESG Measures

NO	Sustainability Assessment	Company	Disclosure 2022				
			ESG score	Rank	Environment	Social	Governance
1	ESG BOOK	169	⁄	⁄	⁄	⁄	⁄
2	DJSI	23	⁄	⁄	-	-	-
3	Moody's ESG Solutions	22	⁄	⁄	⁄	⁄	⁄
4	MSCI	67	⁄	⁄	-	-	-
5	Refinitiv	168	⁄	⁄	⁄	⁄	⁄
6	S&P Global	142	⁄	⁄	⁄	⁄	⁄
7	SET THSI Index	118	⁄	⁄	-	-	-
8	THSI	169	⁄	⁄	-	-	-

Source: http:// www.setsustainability.com accessed on 8th March, 2023.

The Stock Exchange of Thailand (SET) has established specific criteria for the Thailand Sustainability Investment (THSI) index, which includes both initial screening and qualification criteria. These criteria ensure that listed companies maintain high standards of corporate governance, financial stability, and ESG practices.

2.4.1 Thailand Sustainability Investment (THSI) Criteria

The Stock Exchange of Thailand (SET) has established specific criteria for the Thailand Sustainability Investment (THSI) index to ensure listed companies maintain high standards of corporate governance, financial stability, and ESG practices. These

criteria are divided into two main categories: Initial Screening Criteria and Qualification Criteria.

2.4.1.1 Initial Screening Criteria

Companies must meet the following conditions to be considered for THSI:

1. Not under delisting consideration or rehabilitation
2. Not suspended (SP) due to failure to submit financial statements
3. Not marked with a Caution (C) sign
4. Have a free float of at least 150 shareholders or 15% of total shares
5. No unusual trading behavior by directors and executives, or lack of trustworthiness according to SEC announcements

2.4.1.2 Qualification Criteria

To qualify and maintain THSI status, companies must:

1. Have a Corporate Governance Report (CGR) score of 70% or 3 stars and above
2. Meet SET listing status criteria for independent directors, audit committee members, and free float
3. Have no convictions or fines for directors/executives related to corporate governance, social impact, or environmental issues
4. Maintain positive shareholder's equity in the latest financial statements
5. Not report net losses in 3 out of 5 recent years based on the latest financial statements.

These qualification criteria are applied throughout a company's listing period in the THSI.

2.4.2 ESG Scoring Frameworks and Methodologies

The sustainability assessment frameworks presented in Table 2.2 evaluate companies based on their environmental, social, and governance (ESG) practices. These frameworks generate scores and rankings that enable investors to make informed decisions. ESG scores typically reflect a company's performance relative to its sector peers for environmental and social aspects, and relative to its country of registration for governance aspects.

2.4.2.1 ESG Score Calculation Process

The ESG score calculation typically involves the following steps:

1. Industry Classification: Companies are initially grouped by their primary revenue source.

2. Metric Categorization: Each metric is assigned to one of ten ESG categories, addressing crucial issues such as emissions, innovation, and human rights.

3. Category Score Determination: Scores are based on a company's ranking within its industry group, comparing raw metric values with industry peers.

4. Overall ESG Score Computation: ESG scores are derived from the weighted sum of category scores, often using proprietary methodologies like Refinitiv's importance matrix.

2.4.2.2 Refinitiv's ESG Scoring Methodology

Refinitiv, a major ESG data and score provider, employs a comprehensive scoring method based on the following key principles:

1. ESG Importance Weightings: Each metric's importance is rated on a 1-10 scale for each industry, recognizing that ESG factors' significance varies across sectors.

2. Transparency Emphasis: Company disclosure is fundamental to the methodology. The weighting system ensures that non-reporting of 'highly material' data points significantly impacts a company's score.

3. ESG Controversy Adjustment: The method cross-checks companies' actions against their commitments, adjusting scores based on the severity of controversies and company size.

4. Industry and Country Benchmarks: These are applied at the data point level to facilitate meaningful peer group comparisons.

5. Percentile Ranking Method: This approach provides easily interpretable scores ranging from 0 to 100, often accompanied by letter grades.

2.5 ESG Scoring Methodology

2.5.1 Definitive Scores

In the ESG scoring methodology, scores are designated as "definitive" for all historical years except the five most recent ones. For instance, if the latest fiscal year is FY2020, all previous scores obtained before FY2016 will be considered definitive, while scores from FY2016 to FY2020 will not be regarded as such. Definitive scores remain unchanged even if the underlying data is modified due to corporate restatements or data corrections. This approach ensures the stability and reliability of historical ESG scores, providing investors with a consistent basis for evaluating a company's ESG performance over time.

2.5.2 Coverage Universe

The ESG scoring methodology is applied to a universe of 12,500 public and private companies worldwide. The regional breakdown of the coverage universe is illustrated in the figure below. The coverage has expanded over time as new indices are integrated, and this growth is expected to continue. Each quarter, as new companies are added to the coverage, the index components are reviewed. Currently, the coverage includes companies from the Russell 3000 Index. The timeline of various indices being incorporated into the ESG universe is depicted in the illustration below.

2.5.3 Scores Overview

ESG scores are calculated and available for all companies and historical fiscal periods in the ESG global coverage, dating back to fiscal year 2002 for approximately 1,000 companies, primarily from the United States and Europe. The ESG scoring model comprises two overall ESG scores:

1. ESG Score: This score measures a company's ESG performance based on verifiable reported data in the public domain. It assesses the company's environmental, social, and governance practices using a range of indicators and metrics sourced from publicly available information, such as corporate sustainability reports, annual reports, and regulatory filings. The ESG score provides a comprehensive evaluation of a company's sustainability performance based on transparent and objective data.

2. ESG Score: The ESG score builds upon the ESG score by overlaying it with ESG controversies. This additional layer of analysis takes into accountancy controversies or negative events related to a company's ESG practices, such as environmental accidents, labor disputes, or governance scandals. By incorporating ESG controversies, the ESG score offers a more complete picture of a company's sustainability impact and conduct over time. This score helps investors identify companies that not only have strong ESG policies and practices in place but also manage ESG risks effectively and avoid significant controversies.

The inclusion of both the ESG score and the ESG score in the model allows for a nuanced and comprehensive assessment of a company's ESG performance. While the ESG score focuses on the company's reported sustainability practices, the ESG score adds an extra dimension by considering any negative events or controversies that may impact the company's overall sustainability profile. By providing these two complementary scores, the ESG scoring methodology enables investors to make well-informed decisions based on a holistic view of a company’s ESG performance and risk management.

2.5.4 Score Structure

The ESG evaluation system employed by Refinitiv assesses companies using a carefully selected group of 186 ESG indicators. These were chosen from a broader set of over 630 measures, based on their relevance and comparability across different industries. The chosen indicators are organized into three main categories: environmental impact, social responsibility, and corporate governance.

In this system, the significance of environmental and social factors varies depending on the industry, resulting in different weightings for these categories across sectors. However, the importance of governance practices is considered universal, so its weighting remains constant across all industries. The final scores for each of the three ESG dimensions are calculated by combining the weighted category scores. This approach, which takes into account industry-specific factors, ensures that the resulting ESG scores offer a meaningful and comparable evaluation of a company's sustainability efforts within its specific industry context.

Refinitiv's comprehensive ESG assessment process involves analyzing over 630 company-level ESG measures. From these, 186 key indicators (detailed information available in the ESG glossary upon request) are used to drive the overall company evaluation and scoring. These indicators are grouped into 10 distinct categories, which are then used to formulate the three pillar scores and the final ESG score. This score reflects a company's ESG performance, commitment, and effectiveness, based on publicly available information.

The scoring process involves aggregating category scores into three pillar scores – environmental, social, and corporate governance. The ESG pillar score is calculated as a weighted sum of the category scores, with weights varying by industry for the environmental and social categories. Governance weights, however, remain consistent across all industries. To ensure comparability, the pillar weights are standardized to percentages between 0 and 100.

2.6 Concepts of Sustainability

The concept of sustainability emerged in the 1970s as a result of the ongoing dialogue surrounding economic growth, environmental conservation, and societal well-being. It became increasingly recognized that economic development should strive for sustainability by minimizing negative impacts on both current and future generations, with a specific focus on the welfare of individuals. Although this is often perceived as an idealistic objective, the reality is that achieving sustainable development is a long-term endeavor that cannot be accomplished within a short period. In modern times, sustainable development has become deeply embedded within societal norms and values, leading to heightened expectations from various stakeholders, such as companies, governments, non-governmental organizations, and other institutions, to disclose information regarding their sustainability performance. This transparency allows society to assess the degree to which these entities adhere to sustainable practices and contribute to long-term societal well-being (Godfrey, 2007).

The three key dimensions of the environment, society, and governance have emerged as essential elements in the social responsibility reporting of enterprises. These dimensions have garnered significant attention from businesses and their stakeholders

worldwide, as they play a crucial role in the development of sustainable strategies that have a lasting impact on the enterprises' future growth (Michelson,2004). Recognizing this importance, governmental departments and regulatory agencies in Thailand have also issued several documents to provide support and guidance in this area, reflecting the growing recognition of the significance of sustainability practices and their integration into business operations.

However, discounting this perspective, the remaining viewpoints demonstrate a limited understanding of traditional financial accounting principles. The formulation of the principles outlined in the 2002 guidelines has led to a minimal restructuring of the existing principles, thereby perpetuating the deficiencies in accounting principles within the framework of Sustainable Development. Furthermore, the principle of "wholeness" presents significant challenges in terms of information overload, as it becomes increasingly difficult to effectively categorize the most critical issues.

2.6.1 Performance Appraiser in Evaluating Sustainability

The role of performance appraiser in evaluating sustainability is crucial in assessing the environmental, social, and governance (ESG) performance of organizations. As a multifaceted concept, sustainability encompasses various dimensions that require systematic evaluation to determine an organization's progress in achieving its sustainability goals. A performance appraiser serves as a vital agent in this process, employing established methodologies and frameworks to assess and measure sustainability performance.

The primary objective of the performance appraiser is to analyze the organization's activities, strategies, and initiatives through the lens of sustainability. By examining key indicators, such as carbon footprint, energy efficiency, waste management, social impact, employee well-being, and corporate governance practices, the appraiser can provide an objective assessment of the organization's sustainability performance. To conduct a comprehensive sustainability appraisal, the performance appraiser relies on established frameworks and standards, such as the Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), and the United Nations Sustainable Development Goals (SDGs). These frameworks offer a systematic approach for measuring and reporting sustainability performance, ensuring comparability

and consistency across organizations.

Through data collection, analysis, and stakeholder engagement, the performance appraiser identifies areas of strength and weakness within the organization's sustainability efforts. This evaluation facilitates the identification of improvement opportunities, the formulation of sustainability strategies, and the establishment of benchmarks for future progress. Furthermore, the performance appraiser plays a vital role in ensuring accountability and transparency in sustainability reporting. By conducting rigorous assessments and verifying the accuracy of reported data, the appraiser enhances the credibility of sustainability disclosures and facilitates informed decision-making for stakeholders, including investors, regulators, and the wider public.

In summary, the performance appraiser serves as a critical evaluator of sustainability performance, employing recognized frameworks and methodologies to assess an organization's environmental, social, and governance practices. By providing objective analysis and verification, the appraiser contributes to enhancing organizational sustainability, promoting transparency, and facilitating informed decision-making in the pursuit of sustainable development.

2.6.2 Environment, Social and Governance Disclosure

In this study, our primary focus revolves around examining the extent of information disclosure pertaining to social responsibility, specifically within the domains of environment (E), society (S), and governance (G). To obtain the required data for our analysis, we rely on Refinitiv, a reliable and comprehensive source. The ESG information disclosure scores provided by Refinitiv serve as a metric to quantify the level of disclosure of ESG-related data within corporate public reports, emphasizing ESG transparency rather than evaluating actual performance. These scores are derived based on the extent of information disclosure across the three dimensions, ranging from 0.1 to 100. Higher scores indicate a greater level of information disclosure and transparency, demonstrating the commitment of organizations towards fulfilling their social responsibilities to various stakeholders. These scores play a crucial role in disseminating non-financial information to stakeholders, aiding them in making informed decisions. Additionally, Refinitiv adjusts the scores based on industry-specific considerations, enabling differentiation between various sectors. For instance, higher weightage may be assigned to the disclosure

of emissions from polluting gases compared to other types of information.

Looking beyond the complex and, at times, tragic events of 2021, the forthcoming year of 2022 is anticipated to be centered around sustainability. Within this context, climate change is projected to emerge as a paramount risk factor, denoted by the "E" in the ESG framework, accompanied by the persistent and significant societal repercussions of the Covid-19 pandemic, contributing to the sphere of social risk, denoted by the "S". Moreover, the ongoing ramifications of Brexit and the lingering uncertainties surrounding the containment of Covid-19 reinforce the necessity for companies to prioritize governance principles, as denoted by the "G", when managing their supply chains. Additionally, the market's volatility, compounded by Russia's military aggression against Ukraine, will compel companies to heighten their attention to ESG considerations. Consequently, our future investigations conducted over an extended timeframe will need to account for these influential aspects.

Supporters of the ESG phenomenon emphasize the pivotal role played by the disclosure of ESG information in the company's value creation process. The significance of this aspect stems from the various effects associated with the "ESG report," including enhanced transparency, improved internal and external decision-making processes, and the preservation and reinforcement of financial stability (Eccles and Saltzman, 2011; Eccles et al., 2015). These factors underscore the fundamental importance of ESG reporting in facilitating informed assessments and strategic actions within organizations. Numerous recent studies have highlighted the substantial role played by sustainability reports in fostering transparency and their discernible impact on corporate finance (Jensen and Berg, 2012; Adams, 2017). Notably, the Steyn (2014) study provides empirical evidence demonstrating the positive influence of sustainability reports on businesses, particularly in enhancing their financial performance.

Moreover, a wealth of scientific research attests to the reputational benefits and substantial competitive advantages that companies gain through the disclosure of ESG data (Gardberg and Fombrun, 2006; Brown et al., 2009; Simnett et al., 2009). These findings collectively emphasize the compelling link between sustainability reporting, corporate outcomes, and overall organizational success.

2.7 CEO Power

This study primarily focuses on ESG disclosure scores as the key independent variable. While some ESG disclosures are mandated by regulations, many are voluntary, reflecting a company's commitment to transparency and accountability from a stakeholder perspective.

The concept of power, particularly in relation to CEOs, is complex and often debated in management literature. Early discussions of power in organizational contexts can be traced back to Emerson's work in 1962. Salancik and Pfeiffer (1977) broadly defined power as the ability to control people, resources, or actions. In the specific context of corporate leadership, Haleblian and Finkelstein (1993) characterized CEO power as the ability to overcome opposition and consistently shape critical organizational decisions.

Expanding on this, Adams et al. (2005) described powerful CEOs as those who can consistently influence important company decisions, even when faced with potential resistance from other executives. These definitions primarily focus on internal organizational dynamics. However, Finkelstein (1992) argued that CEO power also encompasses the ability to navigate both internal and external challenges. Baldenius et al. (2014) further emphasized that a powerful CEO exerts significant control over other managers and directors, thereby shaping the overall direction of the company.

Some researchers, such as Finkelstein and Hambrick (1996) suggest that CEOs are motivated to achieve high performance due to their considerable power, which allows them to bypass potential board-imposed obstacles that might hinder swift action for performance improvement.

In the broader context of corporate governance, CEO power is often closely linked to the concept of CEO duality - where the CEO also serves as the board chair. This governance structure can significantly impact decision-making processes and overall business performance. The debate around CEO duality is ongoing in corporate finance literature. Proponents, such as Baliga et al. (1996), argue that concentrating power in one individual leads to more effective management and better firm performance, as it allows for more streamlined strategy formulation. Critics, however, including Fizel et al. (1990), contend that CEO duality may compromise board independence.

The interplay between CEO power, board size, and other governance factors plays a crucial role in shaping a company's profitability and sustainability. Understanding these dynamics is particularly important for assessing the operational efficiency and financial viability of various businesses, including service companies.

This study aims to contribute to this ongoing discussion by examining the dual roles of CEOs in the context of ESG disclosure and firm performance, considering the complex relationships between leadership power, corporate governance structures, and organizational outcomes.

Furthermore, we operationalize CEO power using two key variables: CEO duality and CEO skill. Table 2.3 provides precise definitions for these variables, which will be used in our empirical analysis. These measures capture different aspects of CEO power and influence within the organization. CEO duality represents the structural power that comes from combining the roles of CEO and board chair, while CEO skill serves as a proxy for the expertise-based power derived from specific educational qualifications. By incorporating these variables, we aim to provide a nuanced examination of how different dimensions of CEO power may impact ESG disclosure and firm performance.

Table 2.3 Definitions of CEO power

Variables name	Definitions
CEO duality	A dummy variable, coded “1”, if the chairman and the chief executive officer (CEO) are the same person; and coded “0” otherwise (Javeed and Lefen, 2019; Muttakin et al., 2019).
CEO skill	If the CEO has obtained a certificate in financial and legal studies, it is denoted as "1"; otherwise, it is denoted as "0".

2.8 Institutional Ownership

According to the agency theory proposed by Jensen and Meckling (1976), the relationship between managers and shareholders gives rise to agency costs, which have detrimental effects on a firm's performance. From the perspective of agency costs, institutional investors possess the ability to monitor and influence corporate policies, thereby impacting board decisions and assuming the costs associated with effective monitoring and active ownership. Consistent with the tenets of agency

theory, the presence of institutional investors in a stakeholder-oriented system is expected to facilitate robust monitoring. Firstly, institutional investors, being professional shareholders, possess the expertise to gather and organize information that can contribute to the company's performance improvement (Javeed & Lefen, 2019), thus mitigating agency issues. Secondly, institutional investors exert control and discipline over corporate managers in China due to their power and aligned incentives (Lin & Fu, 2017).

Furthermore, institutional investors advocate for shareholder-driven corporate strategies that confer advantages and augment firm value. Wahal and McConnell (2000) conducted a study that analyzed the expenditures of over 2500 US firms on property, plant, and equipment (PP&E) and research and development (R&D) from 1988 to 1994. Contrary to the proposition that institutional investors induce myopic behavior in corporate managers, their findings do not support such claims. In fact, they discovered a positive relationship between industry-adjusted expenditures for PP&E and R&D and the proportion of shares owned by institutional investors.

This relationship remained robust even after conducting various empirical tests that accounted for endogeneity between institutional ownership and discretionary expenditures at the firm level. This research, published by Elsevier Science B.V., holds significant implications for understanding the impact of institutional ownership on corporate spending decisions. Following pertinent theories and prior research, there exists a strong correlation between ESG performance, ownership structure, and firm value. Demonstrating commendable ESG performance enhances the trust and assurance of stakeholders and investors, thereby elevating the overall corporate value (Peng, 2020).

In a study by Baysinger et al. (1991), the researchers examined how the composition of a corporation's board of directors, the concentration of equity ownership, and the influence of individual and institutional stockholders affect the company's R&D strategy. Their findings revealed that a higher representation of insiders on the board and a concentration of equity ownership among institutional investors had a positive effect on corporate spending on R&D. These findings contribute to our understanding of the factors influencing firms' allocation of resources to research and development initiatives.

Table 2.4 Definitions of Institutional ownership

Variables	Definitions
Institutional ownership (INS)	The percentage of the number of shares owned by the institution to the total number of shares outstanding

Institutional ownership was measured by the percentage of the number of shares owned by the institution to the total number of shares outstanding (Handriani and Robiyanto, 2019).

2.9 Board Characteristics

Previous research, the inclusion of more directors with diverse backgrounds, talents, skills, and professional experiences in larger boards is thought to enhance the boards' planning and decision-making processes, ultimately benefiting the performance of the businesses

Board characteristics play a crucial role in corporate governance and have a significant impact on firm performance. Belkhir (2009) defines board size as an essential factor affecting the effectiveness of the board of directors. Jilani and Chouaibi (2021) also find that larger board sizes are more effective in alleviating agency problems and have a significant effect on corporate value. A larger board can bring a diverse range of expertise, experience, and perspectives, which can enhance the decision-making process and improve the board's monitoring function.

Bathula and Singh (2015) studied board characteristics and firm performance: evidence from New Zealand. The study found that board size is positively associated with firm performance, indicating the value of a larger board for the firm. Board size was also found to be positively associated with firm age and firm size. Several studies have examined the moderating effect of board characteristics on the relationship between various factors and firm performance. For instance, Rossi, Jilani, and Chouaibi (2021) conclude that board characteristics, including board size, board independence, and CEO duality, have a partially moderating effect on the relationship between Corporate Social Responsibility (CSR) practices and financial performance in European firms. This

suggests that the effectiveness of CSR initiatives in improving financial performance may depend on the composition and structure of the board.

Similarly, Gerged et al. (2021) argue that managerial and institutional ownership, the largest shareholder, and foreign ownership moderate the relationship between environmental disclosure and earnings management. This highlights the importance of considering ownership structure and its interaction with board characteristics when examining the impact of environmental disclosure on financial reporting quality.

Furthermore, Albitar et al. (2020) find that governance mechanisms, such as gender diversity, ownership concentration, and board size, moderate the relationship between Environmental, Social, and Governance (ESG) disclosure and firm performance. This implies that the effectiveness of ESG disclosure in enhancing firm performance may be influenced by the diversity and composition of the board, as well as the concentration of ownership.

Table 2.5 Definitions of board characteristics

Variables name	Definitions
Board size	Total number of directors on the board at period (Cao et al.,2023; Wu et al., 2022)
Board gender	The ratio of a number of female directors to the total number of directors on the board (Cao et al, 2023; Wu et al., 2022)

Therefore, this study that Board Characteristics moderates ESG score on firm performance.

2.10 Firm Performance

Despite the evolution of firm performance measurement concepts from traditional to modern measures, financial measures continue to hold significant importance in assessing firm performance. Profitability measures such as Tobin's Q, operating profit margin, and net income remain critical indicators of business success. The objective of this study is to examine the relationship between Environmental, Social,

and Governance (ESG) factors, CEO power, ownership structure, and firm performance. Specifically, this study focuses on profitability measures as the primary yardstick for assessing firm performance, prioritizing them over measures of liquidity, solvency, or repayment capacity. The concept of "firm performance" is subject to varying interpretations based on individual perspectives and can be characterized as abstract, general, loosely defined, or precisely defined. Nevertheless, the prevailing definitions of firm performance consistently emphasize an organization's capacity to attain its business objectives, necessitating the implementation of a robust firm performance measurement system.

Table 2.6 Firm performance measures

Author	Measures			
	Tobin's Q	**ROA**	**ROE**	**Others**
Cherian et al. (2019)		✓	✓	Price to Book Value, Return on Capital Employed, Profit after Tax, Profit before Tax, Turnover
Javeed and Lefen (2019)		✓	✓	
André, Cho, and Laine (2018)	✓	✓		Growth Rate
Manokaran et al. (2018)		✓	✓	EPS
Lee, Zhou, and Wang (2018)	✓	✓	✓	
Masoud and Halaseh (2017)		✓	✓	Price to Book Value Capital Employed, Price Earning, EPS
Bae , Kim and Oh (2017)	✓	✓		Growth Rate, Revenue, Profit

Firm Performance Measurement System

2.10.1 Tobin's Q

Tobin's Q ratio, created by Yale University economist James T. Tobin (Hayes, 2018), is a common tool for measuring company performance. This ratio compares a company's market value to the replacement cost of its assets. It helps investors determine if a company or market is valued fairly.

The ratio is determined by dividing the market value of a company's assets by their replacement value. Market value refers to the current stock price, while replacement value is the cost to replace all assets. However, replacement value can be hard to calculate

accurately. As a result, many financial experts use the book value of assets, which is readily available in financial reports.

Chung and Pruitt (1994) developed a simplified method for calculating Tobin's Q. Their approach has been tested and shown to be more than 96% accurate compared to more complex methods. The formula for Tobin's Q using their method is:

$$\text{Tobin's Q ratio} = \frac{(\text{MVS} + \text{D})}{\text{Total Asset}}$$

Frequent financial performance measures are employed to assess the performance of a firm. These measures encompass a range of tools, including price to book value, return on capital employed, profit before tax, profit after tax, growth rate, debt ratio, earnings per share, return on investment, and stock return. These metrics provide valuable insights into different aspects of a company's financial performance and are commonly utilized by researchers and practitioners to evaluate and compare firms in diverse industries and contexts.

Tobin's Q is widely recognized as an important variable in the examination of firm performance. According to Shen et al. (2016), Tobin's Q is considered the most effective performance measure for evaluating ESG aspects. This ratio provides valuable insights into a company's ability to efficiently utilize its assets or shareholder equity to generate profits, making it a suitable indicator of overall firm performance. As a result, in this study, Tobin's Q is adopted as the chosen measure of firm performance.

2.11 Control Variables

1) Firm Size

Organizations vary in size, which can be determined by factors such as personnel, finance, management, technology, production capacity, and competitiveness. The size of an organization can significantly impact its business opportunities, as larger organizations with more resources often have higher competitiveness. In general, large companies possess greater wealth, business prospects, and transaction volumes. However, the audit process in large companies is typically carried out more carefully and thoroughly to ensure that the evidence obtained provides relevant information. According

to Saragih (2019), firm size can be a function of the speed of financial reporting, implying that larger firms, as measured by their total assets, may experience longer audit delays.

In this study, registered capital and assets will be used to represent the size of the business. The size of a company varies due to the complexity of its business structure. Larger companies with larger boards of directors tend to require more time for decision-making processes.

2) Leverage

Previous empirical evidence has yielded mixed results regarding the impact of leverage on financial distress. For example, Pawitri and Alteza (2020) found that leverage positively affected financial distress, while Yuliani and Sulpadli (2020) stated that leverage had a negative effect on financial distress. However, the results of these two studies contradicted those of Stephanie et al. (2020) and Maulidia and Asyik (2020), which found that leverage had no effect on financial distress conditions.

However, leverage also increases the variability (risk) of advantage, because if the company's profit is lower than its fixed costs, the use of leverage will reduce shareholder profits.

3) Auditor Type

The type of auditor engaged by a company can serve as a control variable in studies examining firm performance. Different auditor types, such as Big Four accounting firms versus non-Big Four firms, may have varying levels of expertise, resources, and reputations that can influence the quality and reliability of financial reporting.

4) Industry

Companies listed on the Stock Exchange of Thailand represent a diverse range of industries. Each industry has unique characteristics in terms of products, operations, technology, competition, related regulations, and operational work expertise. As a result, each type of industry may require a committee with specific industry knowledge to determine the vision, goals, strategies, operations, tracking, and evaluation of specific performance, especially in industries with complex operations. Controlling for industry effects is important in studies examining firm performance, as different industries may have inherent differences that can impact the relationships between variables of interest.

In summary, firm size, leverage, auditor type, and industry are important control variables to consider when examining the relationship between ESG score, CEO power, ownership structure, and firm performance. By including these control variables in the analysis, researchers can account for the potential confounding effects of these factors and obtain more reliable and robust results. The inclusion of control variables helps to isolate the specific impact of the independent variables on the dependent variable, providing a clearer understanding of the relationships under investigation.

Summary of Research on Environmental, Social, Governance, and Firm Performance

Recent academic literature has extensively explored the complex relationships between Environmental, Social, and Governance (ESG) factors and corporate performance. This summary synthesizes key findings from several studies, highlighting the multifaceted nature of ESG impacts and the various moderating factors that influence these relationships.

Regarding ESG performance and firm value, Wu and Li (2022) conducted a comprehensive study on the impact of ESG performance on firm value, incorporating ownership structure as a moderating factor. Their research revealed a positive influence of ESG performance on firm value, with executive and institutional ownership playing significant moderating roles. This finding underscores the importance of considering ownership dynamics when assessing the ESG-firm value relationship. In a related study, Quintiliani (2022) corroborated these findings, providing further evidence supporting a positive relationship between ESG practices and various financial performance indicators. These studies collectively suggest that robust ESG practices can enhance firm value, though the strength of this relationship may be contingent on ownership structures.

In terms of ESG and financial performance metrics, Velte (2017), focusing on the German market, found that ESG performance positively influenced return on assets (ROA) but showed no significant impact on Tobin's Q. This nuanced finding highlights the importance of considering multiple financial performance metrics when evaluating ESG impacts. Similarly, Aydoğmuş et al. (2022) investigated how ESG performance affects both firm value and profitability. Their results indicate that overall ESG scores, as well as individual Social and Governance scores, positively correlate with firm value and

profitability. Interestingly, they found that the Environmental score showed no significant relationship with firm value, suggesting potential variations in the impact of different ESG components.

Several studies have explored various moderating factors in the ESG-performance relationship. Salehi and Gholezoo (2022) examined how investment efficiency affects firm value, with institutional ownership and board independence as moderating variables. Their research revealed that both these factors moderate the relationship between investment efficiency and firm value. Maigoshi (2022) analyzed the interplay between institutional ownership, CEO power, and firm performance. Their findings demonstrated positive associations between these factors, with CEO power enhancing the relationship between institutional ownership and performance.

The role of board characteristics in ESG performance has also been a focus of recent research. Macchioni et al. (2022) investigated the influence of board gender diversity on ESG performance, considering CEO duality as a moderating factor. Their results suggest that greater gender diversity on boards generally improves ESG performance, while CEO duality negatively moderates this relationship. Moreover, a study by Halid et al. (2022), studying the Malaysian context, suggested that board independence positively correlates with ESG scores, while other board characteristics showed no significant association. These findings highlight the potential importance of board composition in driving ESG performance.

Regarding industry-specific considerations, Chen et al. (2023) provided valuable insights into the relationship between ESG performance and financial outcomes, particularly in environmentally sensitive industries. Their research offers empirical evidence supporting a positive association between corporate success and ESG performance, emphasizing the importance of ESG integration in business organizations, especially in sectors with significant environmental impacts. Likewise, Aydoğmuş et al. (2022) provided a more granular analysis of ESG components and their relationship with firm performance. Their study revealed that the overall ESG combined score is positively and significantly associated with firm value. Interestingly, while individual Social and Governance scores showed positive and significant relationships with firm value, the Environmental score did not demonstrate a significant relationship. However, when

considering profitability, all components – the ESG combined score, as well as individual Environmental, Social, and Governance scores – exhibited positive and significant relationships. These nuanced findings suggest that while investing in high ESG performance may generally promise financial returns in terms of both value and profitability, the impact of individual ESG components may vary depending on the specific performance metric considered. This underscores the complexity of ESG effects and the importance of considering multiple performance indicators when evaluating the financial implications of ESG practices.

This body of research collectively demonstrates the complex and multi-dimensional nature of the relationships between ESG factors and corporate performance. The studies highlight the importance of considering various moderating factors, such as ownership structure, board characteristics, and CEO power, in understanding these relationships. Moreover, they underscore the need for nuanced approaches that account for industry-specific contexts and different components of ESG performance. The ongoing development of this research area is likely to yield more profound understanding of these complex relationships, offering critical insights that will inform both scholarly discourse and practical applications in sustainable business management.

Table 2.7 Summary of studies on environmental social and governance and firm performance

Researcher	Researcher Title	Statistic	Independent	Dependent	Result
Shiyu Wu and Zexin Li (2022)	The Impact of ESG Performance on Firm Value: The Moderating Role of Ownership Structure.	Regression	ESG rating Moderating ownership structure	Tobin's Q	(1) ESG performance is important in improving firm value, (2) executive ownership and institutional ownership positively and significantly affect firm value, while ownership concentration and equity balance have no impact and (3) executive ownership and institutional ownership moderate the link between ESG performance and firm value, whereas the moderating role of ownership concentration and equity balance is not significant.
Mahdi Salehi and Fatemeh Eidi Gholezoo (2022)	The Impact of Investment Efficiency on Firm Value and Moderating Role of Institutional Ownership and Board Independence	Regression	Investment efficiency Moderating institutional ownership and board independence	Tobin's Q	Investment efficiency has an impact on firm value. In addition, institutional ownership and board independence moderate this impact. There is a gap between the impact of investment efficiency on firm value and the moderating role of institutional ownership and board independence.
Patrick Velte (2017)	Does ESG performance have an impact on financial performance? Evidence from Germany.	Regression	Institutional wnership Moderating Ownership structure	ROA	Institutional Ownership is positively. however, with the powerful CEO intervention,the performance will improve even more

Table 2.7 Summary of studies on environmental social and governance and firm performance (Cont.)

Researcher	Researcher Title	Statistic	Independent	Dependent	Result
Mohammed W.A and Maigoshi (2024)	Moderating effect of CEO power on institutional ownership and performance.	Regression	ESGP ENS SOS GS	ROA Tobin's Q	ESGP has a positive impact on ROA but no impact on Tobin's Q.
Romano, M., Cirillo, A., Favino, C., & Netti, A. (2020).	ESG (Environmental, Social and Governance) Performance and Board Gender Diversity: The Moderating Role of CEO Duality	Regression	Board gender diversity Moderating CEO_duality	ESG score	- A greater gender diversity on BoD has an overall positive influence on ESG performance, - CEO duality. negatively moderates the foregoing relationship.
Andrea Quintiliani (2022)	ESG and Firm Value	Regression	ESG score	Levered free cash flow (LFCF) ROE Current ratio (CR) quick ratio (QR) stock price of firm(SP)	Finding support the positive relationship between ESG and firm performance
Halid, S., Mahmud, R., Suffian, M. T. M., & Abdul, R. (2022)	Does Firm's Board Affects ESG? Malaysian Evidence.	Regression	ESG score	Board Size, Board Independence, BoardTenure, Board Diversity	Board independence is significantly positively associated with ESG scores. Board characteristics; board size, tenure and board diversity, however, is not associated with ESG score
Chen, S., Song, Y., & Gao, P. (2023)	Environmental, social, and governance (ESG) performance and financial outcomes: Analyzing the impact of ESG on financial performance	STATA	ESG score	ROA Tobin's Q	In the context of environmentally sensitive industries, this study findings provide empirical insights to the association between the corporate firms success and ESG performance. In addition, the findings provide insights to the business organizations development and the significance of ESG integration in the business organizations.

Table 2.7 Summary of studies on environmental social and governance and firm performance (Cont.)

Researcher	Researcher Title	Statistic	Independent	Dependent	Result
Aydoğmuş, M., Gülay, G., & Ergun, K. (2022)	Impact of ESG performance on firm value and profitability	Regression	ESG score	ROA Tobin's Q	Findings suggest that overall ESG combined score is positively and significantly associated with firm value. Individual Social and Governance scores have a positive and significant relationship while Environment score does not have a significant relationship with firm value. On the other hand, ESG combined score, Environment, Social, and Governance scores have positive and significant relationships with firm profitability.

Table 2.7 summarizes recent studies examining the relationship between Environmental, Social, and Governance (ESG) factors and firm performance. These studies employ various statistical methods, such as regression analysis and STATA, to investigate the impact of ESG performance on financial outcomes, including Tobin's Q, return on assets (ROA), and return on equity (ROE).

The findings of these studies generally support the positive relationship between ESG performance and firm value. For instance, Wu and Li (2022) find that ESG performance is important in improving firm value and that executive ownership and institutional ownership positively moderate this relationship. Similarly, Quintiliani (2022) and Chen et al. (2023) provide empirical evidence supporting the positive association between ESG and firm performance.

Several studies also explore the moderating role of ownership structure and corporate governance factors on the ESG-firm performance relationship. Salehi and Gholezoo (2022) find that institutional ownership and board independence moderate the impact of investment efficiency on firm value. Romano and Netti (2020) show that board gender diversity positively influences ESG performance, while CEO duality negatively moderates this relationship. Halid and Rahman (2022) find that board independence is positively associated with ESG scores, while other board characteristics such as size, tenure, and diversity have no significant association.

Interestingly, Velte (2022) suggests that institutional ownership is positively associated with ROA, and powerful CEO intervention can further enhance this relationship. Aydoğmus et al. (2022) find that the overall ESG combined score and individual Social and Governance scores have a positive and significant relationship with firm value and profitability, while the Environment score does not have a significant relationship with firm value.

These studies contribute to the growing body of literature on the importance of ESG factors in driving firm performance and highlight the moderating role of ownership structure and corporate governance mechanisms in this relationship. The findings have important implications for investors, managers, and policymakers, as they underscore the need for companies to prioritize ESG considerations in their strategic decision-making and for investors to incorporate ESG factors into their investment analysis and portfolio construction.

Summary

This literature review chapter provides a comprehensive overview of the key concepts, theories, and empirical findings related to Environmental, Social, and Governance (ESG) factors, CEO power, institutional ownership, board characteristics, and their impact on firm performance. The chapter begins by tracing the historical development of ESG and its growing importance in contemporary business and investment practices. It then delves into the theoretical foundations underpinning the study, including agency theory, stakeholder theory, and upper echelons theory.

The review examines the concepts of ESG and sustainability, highlighting the three key dimensions of environment, social responsibility, and governance. It discusses the development of ESG in the Thai context, the role of ESG disclosure and reporting, and the methods used to measure and assess ESG performance, such as ESG scores and ratings.

The chapter also explores the concept of CEO power, its various sources and dimensions, and its potential impact on firm performance. It reviews the literature on institutional ownership, its monitoring and disciplining role, and its influence on corporate strategies and spending decisions. The review then examines board characteristics, such as board size, independence, and gender diversity, and their moderating effects on the relationship between ESG, CSR, and firm performance.

The chapter discusses the measurement of firm performance, emphasizing the importance of financial measures such as Tobin's Q, return on assets (ROA), and return on equity (ROE). It also identifies relevant control variables, such as firm size, leverage, auditor type, and industry, that need to be considered in empirical analyses.

Finally, the chapter presents a summary table of recent studies examining the relationship between ESG factors and firm performance, highlighting the key findings, statistical methods, and moderating variables investigated. The review concludes by emphasizing the growing body of evidence supporting the positive link between ESG performance and firm value, while also acknowledging the complex interplay of ownership structure, corporate governance, and other contextual factors in shaping this relationship.

Overall, this literature review provides a solid foundation for understanding the current state of knowledge on ESG, CEO power, institutional ownership, board characteristics, and firm performance, setting the stage for empirical investigation and hypotheses development in the subsequent chapters of the thesis.

CHAPTER 3
RESEARCH METHODOLOGY

In order to answer the research questions addressed in chapter 1, this chapter presents the research methodology, including population and sample, research variables and measurement, data collection, data processing and analysis as well as research framework and statistical models.

3.1 Population and Sample

This study employs quantitative research methods and relies on secondary data to investigate the relationship between ESG and firm performance and the moderating effects of CEO power, board of director characteristics and institutional ownership of this relationship. The population used in this study were sustainable stock THSI (Thailand Sustainability Investment). There are 168 companies listed on the Thailand Sustainability Investment (THSI) index in 2022. This study employed a purposive sampling method *to* select specific groups of sustainable stocks THSI for analysis. Table 3.1 presents the population and sample for this study. Table 3.2 shows the number and percentage of samples classified by industry group as follows: 1) Argo & Food Industry, 2) Consumer Products, 3) Financial, 4) Industrials, 5) Property & Construction, 6) Resource, 7) Services, and 8) Technology.

Table 3.1 Summary population and sample

Description	Number of Companies
Total Thailand Sustainability Investment (THSI) companies listed on the Stock Exchange of Thailand in 2022	168
Less Outlier data	(3)
Total Sample	**165**

Table 3.2 Samples classified by industry group, sensitive/ non-sensitive industry

Item	Industry group	Sensitive/ Non-sensitive	Companies	
			Number	%
1	Argo & Food Industry	Non-sensitive	22	13.33
2	Consumer Products	Non-sensitive	4	2.42
3	Industrials	Sensitive	24	14.55
4	Property & Construction	Sensitive	27	16.36
5	Resources	Sensitive	23	13.94
6	Services	Non-sensitive	33	20.00
7	Technology	Sensitive	11	6.67
8	Financial	Non-Sensitive	21	12.73
	Total		**165**	**100.00**

Source: http:// www.setsustainability.com accessed on 8th March, 2023.

3.2 Research Variables and Measurement

This study evolves four groups of variables including (1) dependent variable: firm performance, (2) independent variables: Environment, Social and Governance (ESG) performance, (3) moderating variables: CEO power, institutional ownership, board characteristics, and (4) control variables: firm size, leverage, auditor type, and industry type.

3.2.1 Dependent Variable: Firm Performance

The dependent variable in this study is firm performance, which serves as a key measure of the financial performance and value of a company. To assess firm performance, this study adopts a firm market-based perspective. The measurement is shown in Table 3.3.

Table 3.3 Measurement of firm performance

Variables	Symbol	Measurement
Dependent Variable: Firm performance		
Tobin's Q	TBQ	Market Capitalization + Total Liability (divided by Total Asset)

3.2.2 Independent variable: Environmental, Social and Governance (ESG) performance

The independent variable in this study is Environmental, Social and Governance performance (ESG performance). This study focuses on ESG combined score and its pillar score, namely Environmental score, social score and Governance score those are provided by Refinitiv. The measurements are shown in Table 3.4.

Table 3.4 Measurements of ESG performance

Variables	Symbol	Measurement
Independent Variable: ESG performance		
ESG **combined score**	ESG_CS	Total ESG score provided by Refinitiv, consists of Environmental pillar score + Social pillar score + Governance pillar score
Environmental score	ENV	Refinitiv Environmental pillar score
Social score	SOV	Refinitiv Social pillar score
Governance score	GOV	Refinitiv Governance pillar score

3.2.3 Moderating variables: CEO power, institutional ownership, and board characteristics

The moderating variables introduce to observe the moderating effects on the relationship between ESG performance and firm performance in this study consisted of CEO power, institutional ownership and board characteristics. The measurements of all the moderating variables are shown in Table 3.5.

Table 3.5 Measurements of moderating variables: CEO power, institutional Ownership and board characteristics

Variables	Symbol	Measurement
Moderating Variables:		
CEO power:		
CEO duality	CEODU	A dummy variable, coded "1", if the chairman and the chief executive officer (CEO) are the same person; and coded "0" otherwise (Javeed and Lefen, 2019; Muttakin et al., 2019)
CEO Skill		A dummy variable, coded "1", if the CEO gained certificate with financial and legal studies and coded "0" otherwise
Institutional ownership	INS	The total number of directors on the board
Board characteristics:	B**S**	Ratio of the number of female directors to the total number of directors on the board
Board size		
Board gender	BG	

3.2.4 Control variable

Previous studies found that factors affecting firm market-based performance consists of firm size, leverage, auditor type, and industry type. Therefore, this study used these factors as control variables. The measurements of all the control variables are shown in Table 3.6.

Table 3.6 Measurements of control variables: firm size, leverage, auditor type and industry type

Variables	Symbol	Measurement
Control Variables:		
Firm Size	F_SIZE	Natural logarithm of total assets (Beekes & Brown, 2007; Brown & Caylor, 2009)
Leverage	LEV	The ratio of total debt divided by total equity
Auditor type	AUD	A dummy variable, coded "1", if the company was audit by one of the Big 4 audit firms and coded "0" otherwise.
Industry type	DIND	A dummy variable, coded "1", if the company is in the sensitive industry and coded "0" otherwise (non-sensitive industry. Industries that have significant environmental and social impacts, such as energy, chemicals, pulp and paper, mining, and steelmaking, are considered sensitive industries, while other industries are considered non-sensitive (Richardson & Welker, 2001; Lee & Faff, 2009).

3.3 Data Collection

This study used quantitative research methods. The data used in this study is secondary data. The dependent, moderating and control variables were collected from the sample companies' financial statements and annual reports (56-1 One Report) for the year 2022, including information from online database of the Securities and Exchange Commission (SEC) and the SET Market Analysis and Reporting Tool (SETSMART). The independent variable of ESG disclosure scores were collected from the data provided by LSEG (formerly Refinitiv) to measure ESG activities, both as an overall ESG combined scores and as Environment, Social, and Governance pillar scores. At the end of 2022, the LSEG disclosed the ESG performance of 168 companies in Thailand Sustainability Investment (THSI). However, three listed companies were excluded due to the data outliers. Therefore, the 165 listed companies are the sample employed in this study.

3.4 Data Analysis

The statistics used to analyze data comprise descriptive statistics and inferential statistics as follows.

3.4.1 Descriptive Statistics

Descriptive statistics are used to summarize and describe the main characteristics of data set, for example, the central tendency, distribution, and variability. Descriptive statistics used in this study include frequency, percentage, minimum, maximum, mean, and standard deviation.

3.4.2 Inferential Statistics

The inferential statistics used to analyze the data are as follows.

1. Pearson correlation coefficient is used to test the relationship between variables.

2. Multiple regression analysis, Hierarchical multiple regression analysis following the ideas of Baron and Kenny (1986) together with the PROCESS macro for SPSS written by Hayes (2018) were used to test the hypotheses. All the independent variables were transformed to mean-centered to avoid multicollinearity problems (Aiken et al. 1991). Multiple regression analysis is used to test hypothesis 1: ESG disclosure scores affect firm performance. PROCESS macro is used to calculate the interaction effects estimated by the

best fitting OLS regression model and probe the interaction effects. Hierarchical multiple regression analysis and The PROCESS procedure for SPSS model template 1 were used to test the moderating effects of (1) CEO power, (2) institutional ownership, and (3) board characteristics on the relationships between ESG disclosure scores and firm performance which were proposed in hypotheses 2, 3 and 4. Moreover, the pick-a-point approach is used to demonstrate the interaction effects.

3.4.3 Test for the Assumptions of Multiple Regression

Since the data used in this study are secondary and cross-sectional data as mentioned in the previous section, the following regression assumptions were tested.

(1) Data anomaly detection (outlier) by using Mahala Nobis Distance method According to the Mahala Nobis Distance method, the data set is considered abnormal when the p-value is less than 0.001 ($P < 0.001$) (Ghorbani, 2019). The analysis identified three outliers and removed them from the data set. The remaining data set of 165 companies then had a p-value greater than 0.001, indicating that the data set was no abnormalities or free from outliers and could be analyzed further.

(2) Multicollinearity problem

To mitigate the problem of multicollinearity, it is essential to ensure that there is no correlation between the independent variables. This can be evaluated by analyzing the statistical values of tolerances and the variance inflation factor (VIF). If all independent variables have tolerance values above 0.1 and VIF values below 10, it indicates the absence of multicollinearity issues (Hair, 2010).

Additionally, this study also assessed the presence of multicollinearity by examining the linear relationship between all the independent variables using the Pearson Correlation Coefficient method. Hinkle's (1998) criterion was applied to calculate the correlation coefficient, focusing on investigating issues related to the relationship and multicollinearity as follows.

When analyzing the correlation coefficient (r):

$r < 0.20$ indicates an extremely low correlation between variables.

$0.21 < r \leq 0.40$, the correlation between variables is viewed as low.

$0.41 < r \leq 0.60$, the correlation between variables is regarded as moderate.

$0.61 < r \leq 0.80$, the correlation between variables is seen as high.

$r > 0.80$ signifies a very high correlation between variables.

Moreover, to ensure that there is no multicollinearity problem in the analysis due to the interaction between independent and moderating variables, all the independent and moderating variables were transformed into mean-centered to avoid multicollinearity problems.

3.5 Hypotheses and Models Specifications

This study examines the moderating roles of CEO power, institutional ownership, and board characteristics on the relationship between Environmental, Social and Governance disclosure scores and firm performance by using multiple regression analysis and PROCESS macro. The specific models and hypotheses were proposed as follows.

1) Model Test: Do ESG disclosure scores affect firm performance?

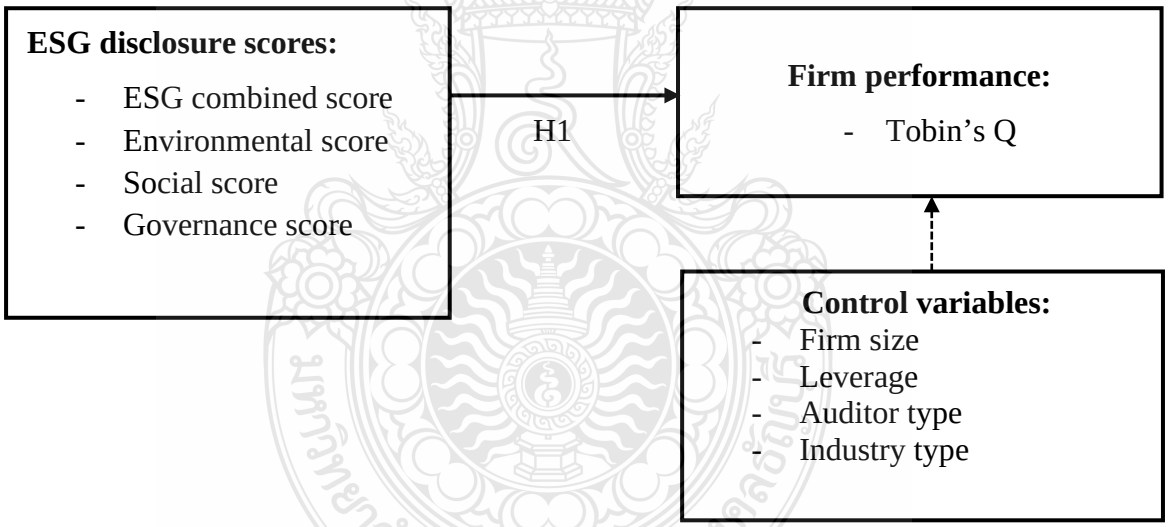

Figure 3.1 The effect of ESG disclosure scores on firm performance

This study proposed the first hypothesis that ESG disclosure scores affect firm performance.

Hypothesis 1: ESG disclosure scores affect firm performance.

H_{1a}: ESG combined score has a positive effect on firm performance.

H_{1b}: Environmental score has a positive effect on firm performance.

H_{1c}: Social score has a positive effect on firm performance.

H_{1d}: Governance score has a positive effect on firm performance.

2) Model Test: Does CEO power moderate the effect of ESG disclosure scores on firm performance and how?

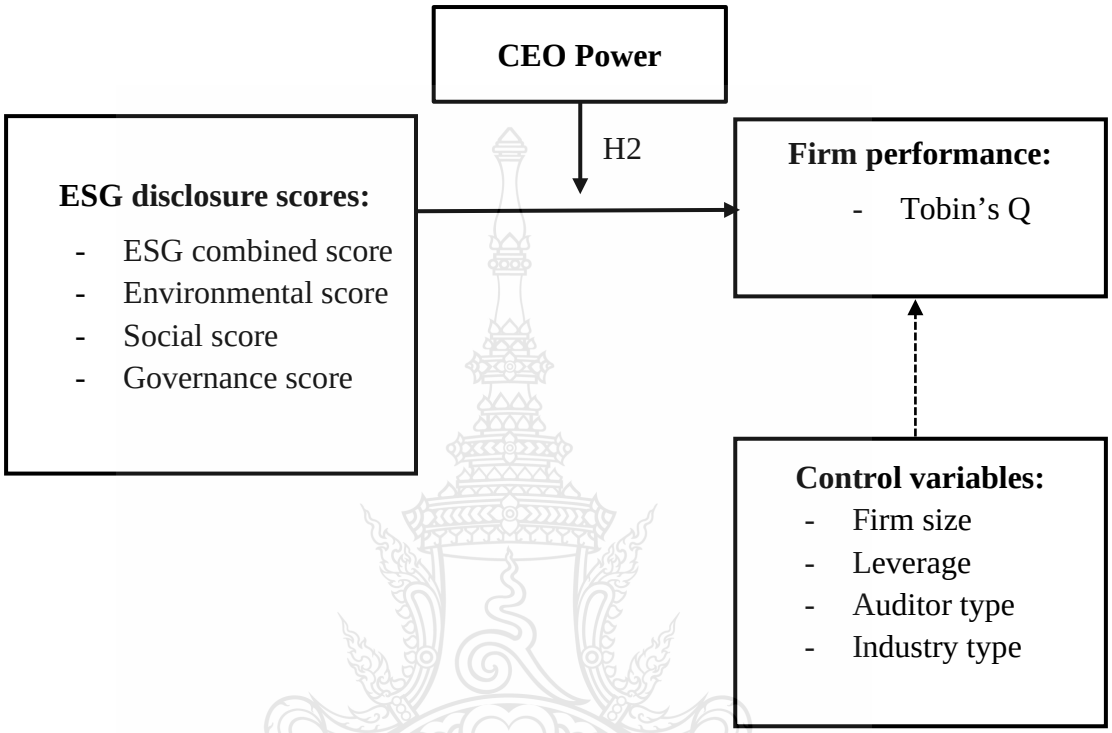

Figure 3.2 Moderating Role of CEO power on the effect of ESG disclosure scores on firm performance

This study proposed the seconds hypothesis that CEO power moderates the effect of ESG disclosure scores on firm performance.

Hypothesis 2: CEO power moderates the effect of ESG disclosure scores on firm performance.

H2a: CEO power moderates the effect of ESG combined score on firm performance.

$H2a_1$: CEO duality moderates the effect of ESG combined score on firm performance.

$H2a_2$: CEO skill moderates the effect of ESG combined score on firm performance

H2b: CEO power moderates the effect of Environmental score on firm performance.

H2b$_1$: CEO duality moderates the effect of Environmental score on firm performance.

H2b$_2$: CEO skill moderates the effect of Environmental score on firm performance.

H2c: CEO power moderates the effect of Social score on firm performance.

H2c$_1$: CEO duality moderates the effect of Social score on firm performance.

H2c$_2$: CEO skill moderates the effect of Social score on firm performance.

H2d: CEO power moderates the effect of Governance score on firm performance.

H2d$_1$: CEO duality moderates the effect of Governance score on firm performance.

H2d$_2$: CEO skill moderates the effect of Governance score on firm performance.

3) **Model Test:** Does institutional ownership moderate the effect of ESG disclosure scores on firm performance and how?

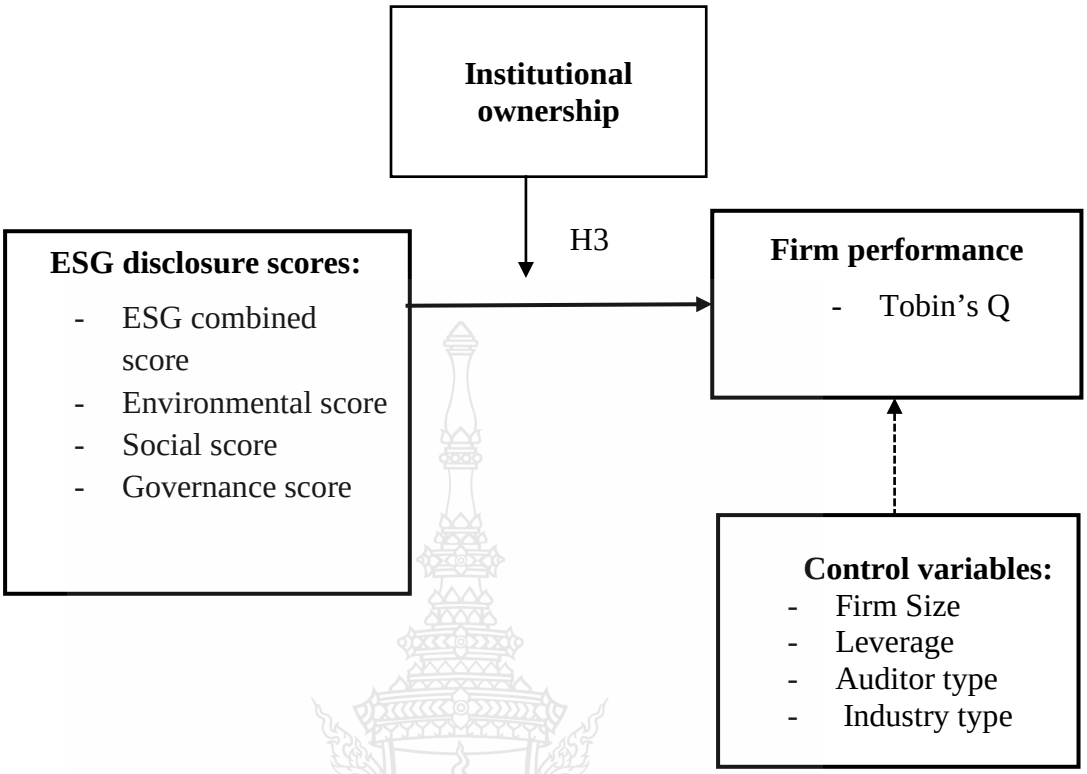

Figure 3.3 Moderating role of institutional ownership on the effect of ESG disclosure scores on firm performance

The study proposed the third hypothesis that institutional ownership moderates the effect of ESG disclosure scores on firm performance.

Hypothesis 3: Institutional ownership moderates the effect of ESG disclosure scores on firm performance.

H3a: Instutitional ownership moderates the effect of ESG combined score on firm performance.

H3b: Instutitional ownership moderates the effect of Environmental score on firm performance.

H3c: Instutitional ownership moderates the effect of Social score on firm performance.

H3d: Instutitional ownership moderates the effect of Governance score on firm performance.

4) Model Test: Do board characteristics moderate the effect of ESG disclosure scores on firm performance and how?

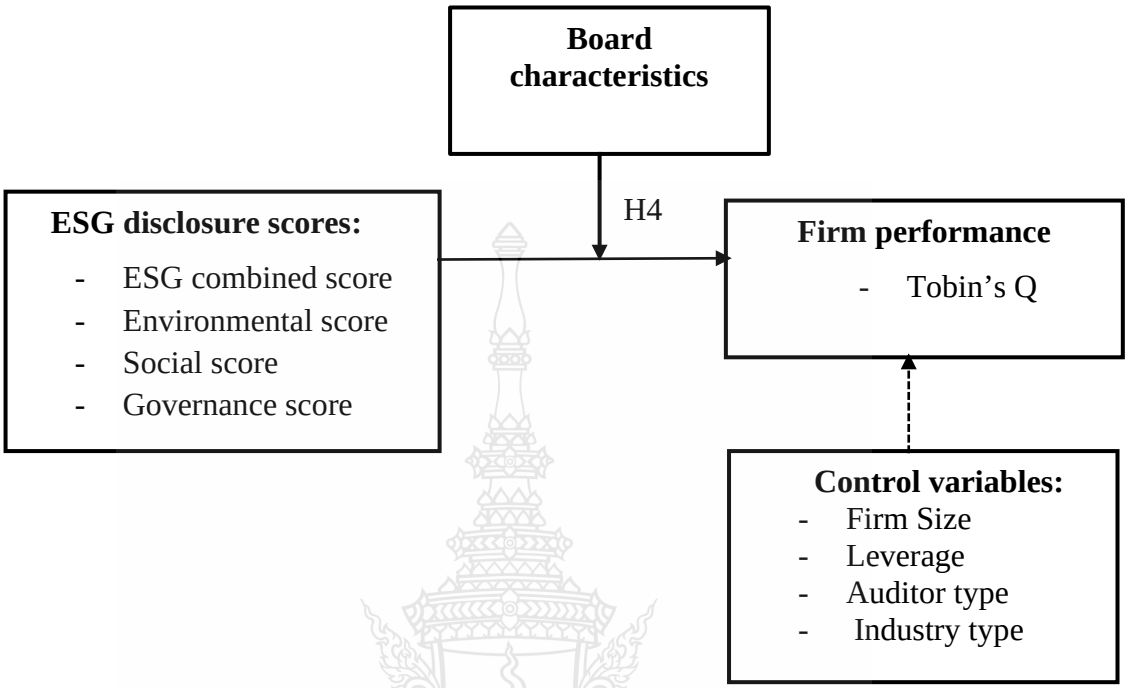

Figure 3.4 Moderating Roles of board characteristics on the effect of ESG disclosure scores on firm performance

This study proposed the fourth hypothesis that the moderate role of board characteristics effect on esg score and firm performance.

Hypothesis 4: Board Characteristics moderate the effect of ESG disclosure scores on firm performance.

H4a: Board Characteristics moderate the effect of ESG combined score on firm performance.

H4a$_1$: Board size moderates the effect of ESG combined score on firm performance.

H4a$_2$: Board gender moderates the effect of ESG combined score on firm performance.

H4b: Board Characteristics moderate the effect of Environmental score on firm performance.

H4b$_1$: Board size moderates the effect of Environmental score on firm performance.

H4b$_2$: Board gender moderates the effect of Environmental score on firm performance.

H4c: Board Characteristics moderate the effect of Social score on firm performance.

H4c$_1$: Board size moderates the effect of Social score on firm performance.

H4c$_2$: Board gender moderates the effect of Social score on firm performance.

H4d: Board Characteristics moderate the effect of Governance score on firm performance.

H4d$_1$: Board size moderates the effect of Governance score on firm performance.

H4d$_2$: Board gender moderates the effect of Governance score on firm performance.

CHAPTER 4
RESEARCH RESULTS

The purpose of this chapter is to present the research results, which consist of three main sections. The first section is descriptive statistics of variables employed in the study. The second section presents the test of multiple regression analysis assumptions. The last section demonstrates the results of the hypothesis testing using hierarchical multiple regression analysis and the PROCESS macro for SPSS to analyze the moderating effects.

4.1 Descriptive Statistics

Descriptive statistics were used to describe and analyze the main features and characteristics of the variables studied in this research. It contains the minimum, maximum, mean, and standard deviation values of the total sample of 165 companies. Table 4.1 shows descriptive statistics for all variables, including independence, control, dependent, and moderating variables.

Table 4.1 Descriptive statistics for all variables

Variable		Min	Max	Mean	S.D.
TBQ	Ratio	0.10	11.78	1.54	1.29
ESG_CS	Percentage	4.49	91.21	51.41	18.85
ENV	Percentage	0.00	97.05	45.71	24.48
SOC	Percentage	5.85	96.49	60.28	19.93
GOV	Percentage	4.69	95.35	51.05	20.40
CEODU	Dummy variable	0.00	1.00	0.59	0.49
CEOSK	Dummy variable	0.00	1.00	0.55	0.50
INS	Percentage	0.00	60.00	17.09	14.81
BS	persons	7.00	18.00	11.17	2.52
BG	Percentage	0.00	75.00	21.61	14.33
F_Size	Natural logarithm	6.51	15.32	10.72	1.74
LEV	Ratio	0.00	9.81	1.64	1.77
AUD	Dummy variable	0.00	1.00	0.92	0.27
DIND	Dummy variable	0.00	1.00	0.41	0.49
Observations = 165					

Note: 1) TBQ: Tobin's Q, 2) ESG_CS: ESG combined scores, 3) ENV: Environment score, 4) SOC: Social score, 5) GOV: Governance score, 6) CEODU: CEO Duality, 7) CEOSK: CEO skill, 8) BS: Board size, 9) INS: Institutional ownership, 10) BG: Board gender diversity, 11) F_Size: Firm size, 12) LEV: Leverage, 13) AUD: Auditor type, and 14) DIND: Industry type.

Table 4.1 shows the descriptive statistics of variables as follows.

1. The dependent variable, firm performance (TBQ) has a mean value of 1.54 with a minimum value of 0.10 and a maximum value of 11.78, along with a standard deviation of 1.29

2. Independent variable:

2.1 ESG Combined score (ESG_CS) has a mean value of 51.41 with a minimum value of 4.49, a maximum value of 91.21, and a standard deviation of 18.85;

2.2 Environmental score (ENV) has a mean value of 45.71 with a minimum value of 0, a maximum value of 97.05, and a standard deviation of 24.48;

2.3 Social score (SOC) has a mean value of 60.28 with a minimum value of 5.85, a maximum value of 96.49, and a standard deviation of 19.93;

2.4 Governance score (GOV) has a mean value of 51.05 with a minimum value of 4.69, the maximum value of 95.35, and the standard deviation of 20.40, respectively.

3. Moderating variable: CEO power, institutional ownership, and board characteristics which are proxied as:

3.1 CEO duality (CEODU) has a mean value of 0.59, the minimum, maximum, and standard deviation values of 0, 1, and 0.49, respectively;

3.2 CEO skill (CEOSK) has a mean value of 0.55, the minimum, maximum, and standard deviation values of 0, 1, and 0.50, respectively;

3.3 Institutional ownership (INS) has a mean value of 17.09, the minimum, maximum, and standard deviation values of 0, 60.00, and 14.81, respectively;

3.4 Board size(BS) has a mean value of 11.17, the minimum, maximum, and standard deviation values of 7.00, 18.00, and 2.317, respectively;

3.5 Board gender diversity (BG) has a mean value of 21.61, the minimum, maximum, and standard deviation values of 0, 75.00, and 14.33, respectively.

4. Control variables:

4.1 Firm size (F_Size) has a mean value of 10.72, the minimum, maximum, and standard deviation values of 6.51, 15.32, and 1.74, respectively;

4.2 Leverage (LEV) has a mean value of 1.64, the minimum, maximum, and standard deviation values of 0, 9.81, and 1.77, respectively;

4.3 Auditor type (AUD) has a mean value of 0.92, the minimum, maximum, and standard deviation values of 0, 1.00, and 0.27, respectively;

4.4 Industry type (DIND) has a mean value of 0.41, the minimum, maximum, and standard deviation values of 0, 1.00, and 0.49, respectively.

4.2 Test of Multiple Regression Analysis Assumptions

The research model is to study ESG disclosure scores as independent variables, firm performance as the dependent variable, and CEO power, institutional ownership, and board characteristics as moderating variables. The study used multiple linear regression analysis to determine the effects of the predictors on the outcome variable and moderation analysis by PROCESS macro for SPSS to explain how the predictor variable affected the outcome variable when moderated by the moderating variable. Before testing the hypothesis, the study needs to examine the multicollinearity problem of the predictor variable as well as the control variables. Table 4.2 shows the results of the variance inflation factor (VIF) and the tolerance values, which indicates the absence of multicollinearity problem since the results correspond to the criteria suggested by Hair (2010) who indicated the absence of multicollinearity issues if all independent variables have tolerance values above 0.1 and VIF values below 10 (Miles & Shevlin, 2001).

Table 4.2 Tolerance and VIF collinearity statistics of variables in the study

Variable	Collinearity Statistics	
	Tolerance	VIF
ESG_CS	.215	4.661
ENV	.321	3.116
SOC	.228	4.378
GOV	583	1.716
CEODU	.903	1.108
CEOSK	.874	1.144
INS	.608	1.644
BS	.801	1.249
BG	.792	1.262
F_Size	.408	2.452
LEV	.637	1.570
AUD	.872	1.147
DIND	.780	1.283

Moreover, this study also applied the Pearson correlation coefficient to confirm whether there is no multicollinearity problem, and the results are shown in Table 4.3, which illustrates a correlation matrix among all the control variables, independent variables, and moderating variables. The result of the correlation matrix analysis shows that there is no correlation coefficient higher than 0.80 (Kumari, 2008), which means that all the variables are not related at a level that is higher than acceptable. Therefore, it is an absence of multicollinearity problem.

Table 4.3 Correlation among all variables.

Variable	ESG_CS	ENV	SOC	GOV	CEODU	CEOSK	INS	BS	BG	FS	LEV	AUD	DIND	TBQ
ESG_CS	1													
ENV	0.738**	1												
SOC	0.806**	0.758**	1											
GOV	0.511**	0.278**	0.256**	1										
CEODU	0.095	-0.027	0.019	0.152	1									
CEOSK	-0.087	-0.052	-0.091	-0.024	-0.087	1								
INS	0.175*	0.105	0.277**	0.035	-0.023	0.119	1							
BS	0.213**	0.341**	0.333**	-0.139	-0.056	-0.012	0.202**	1						
BG	-0.058	-0.180*	-0.241**	0.201**	-0.021	0.133	-0.006	-0.109	1					
F_Size	0.327**	0.429**	0.467**	0.020	0.007	0.167*	0.314**	0.518**	-0.205**	1				
LEV	0.189*	0.168*	0.269**	-0.039	-0.053	0.205**	0.231**	0.232**	-0.022	0.551**	1			
AUD	0.114	0.127	0.142	0.093	0.166*	0.098	0.171*	0.127	0.016	0.258**	0.112	1		
DIND	-0.034	0.098	-0.058	0.074	0.101	-0.111	-0.227**	0.129	-0.020	-0.157*	-0.243**	0.062	1	
TBQ	0.078	0.089	0.053	0.085	-0.007	-0.132	0.091	-0.009	0.029	-0.098	-0.142	0.093	-0.088	1

**Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed)

Notes: ESG_CS: ESG combined scores, ENV: Environmental score, SOC: Social score, GOV: Governance score, CEODU: CEO duality, CEOSK: CEO skill, BS: Board size, BG: Board gender diversity, INS: Institutional ownership, F_size: Firm size, LEV: Leverage, AUD: Auditor type, DIND: Industry type, TBQ: Tobin's Q.

4.3 Results of Hypothesis Testing

Hierarchical multiple regression, Ordinary Least Square (OLS), and PROCESS macro for SPSS were used to test the effect of ESG disclosure scores and control variables on firm performance (TBQ) and the moderating roles of CEO power, institutional ownership, and board characteristics on these relationships. The results are shown in the following tables. Table 4.4 shows the main effect of the ESG Combined score on TBQ and the moderating effects of CEO power, institutional ownership, and board characteristics on this relationship. Table 4.7 shows the main effect of the ENV score on TBQ and the moderating effects of CEO power, institutional ownership, and board characteristics on this relationship. Table 4.10 shows the main effect of the SOC score on TBQ and the moderating effects of CEO power, institutional ownership, and board characteristics on this relationship. Table 4.14 shows the main effect of the GOV score on TBQ and the moderating effects of CEO power, institutional ownership, and board characteristics on this relationship.

Table 4.4 Analysis results of the moderating effects of CEO duality, CEO skill, institutional ownership, board size, and board gender diversity on the relationship between ESG combined score and Tobin's Q

Variable	Model 0		Model 1	Model 2	Model 3	Model 4	Model 5
	Model 01	Model 02	Moderation Models				
	Control	ESG_CS	CEODU	CEOSK	INS	BS	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	1.777**	1.777***	2.124***	2.1467***	2.399***	2.051***	2.184***
	(2.488)	(2.488)	(2.885)	(2.835)	(3.144)	(2.547)	(2.850)
Control Variables							
F_SIZE	-0.059	-0.087	-0.079	-0.085	-0.101	-0.061	-0.084
	(-0.842)	(-1.120)	(-1.106)	(-1.146)	(-1.374)	(-0.975)	(-1.128)
LEV	-0.102	-0.105	-0.999	-0.085	-0.106	-0.109*	-0.105
	(-1.507)	(-1.558)	(-1.497)	(-1.240)	(-1.570)	(-1.655)	(-1.552)
AUD	0.655*	0.635*	0.650*	0.650*	0.583	0.586	0.643*
	(1.711)	(1.670)	(1.704)	(1.692)	(1.520)	(1.563)	(1.659)
DIND	-0.370*	-0.376*	-0.366*	-0.384*	-0.326	-0.374*	-0.376*
	(-1.782)	(-1.820)	(-1.783)	(-1.846)	(-1.544)	(-1.763)	(-1.808)
Main Effect							
ESG_CS		-0.001	0.008	0.007	0.007	0.007	0.008
		(-0.050)	(1.492)	(1.371)	(1.319)	(1.266)	(1.542)
CEODU			-0.097				
			(-0.482)				
CEOSK				-0.273			
				(-1.323)			
INS					0.008		
					(1.173)		
BS						0.017	
						(0.424)	
BG							0.001
							(0.134)
Interaction Effect							
ESG_CS x CEODU			-0.023**				
			(-2.163)				
ESG_CS x CEOSK				-0.005			
				(-0.528)			
ESG_CS x INS					0.008		
					(1.173)		
ESG_CS x BS						-0.005***	
						(-2.616)	
ESG_CS x BG							0.000
							(0.209)
R	0.228	0.257	0.306	0.279	0.272	0.326	0.257
R^2	0.052	0.066	0.094	0.078	0.074	0.106	0.066
R^2 change	0.006	0.066	0.027	0.008	.000	0.039	.000
F	2.193	2.244	2.326**	1.903*	1.795*	2.666**	1.591

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 165 for all models; unstandardized coefficients (B) are reported, and t statistics are reported in parentheses; 1) ESG_CS: ESG combined scores; 2) CEODU: CEO duality; 3) CEOSK: CEO skill; 4) INS: Institutional ownership; 5) BS: Board size; 6) BG: Board gender diversity; 7) F_Size: Firm size; 8) LEV: Debt to equity; 9) AUD: Auditor type; and 8) DIND: Industry type.

According to Table 4.4, the main effect model (Model 02) revealed that ESG_CS had no statistically significant effect on TBQ (B = -.001, p >.10). Thus, H1a: ESG combined score has a positive effect on firm performance, is not supported.

Additionally, the control variables: firm size (F_size) and leverage (LEV) had no statistically significant effect on TBQ, whereas Auditor type (AUD) and Industry type (DIND) had effects on TBQ at a statistically significant level of .10. All control variables account for 5.20% of the variance in support for TBQ, whereas both ESG_CS and all control variables account for 6.60% of the variance in support for TBQ.

The five regression models (Model 1 – Model 5) were analyzed and presented to assess the moderating effect of CEO duality (CEODU), CEO skill (CEOSK), institutional ownership (INS), board size (BS), and board gender diversity (BG), on the effect of ESG_CS on TBQ.

Model 1 is designed to test H2a1: CEO duality moderates the effect of ESG combined score on firm performance. This model is designed with ESG_CS as the main effect and CEODU as the moderating effect. The analysis shows that ESG_CS had no statistically significant effect on TBQ (B = .008, p >.10), besides CEODU has no statistically significant impact on TBQ (B = -.097, p >.10). Interestingly, the regression coefficient for the product of ESG_CS and CEODU is negative and statistically significant at a level of .05 (B = -.023, p < 0.05), and ESG_CS, CEODU, and all control variables account for approximately 9.40% of variance in support for TBQ. The results indicate that CEODU moderates the effect of ESG_CS on TBQ, which means that the effect of ESG_CS on TBQ depends on CEODU. Thus, $H2a_1$ is supported.

Model 2 is designed to test $H2a_2$: CEO skill (CEOSK) moderates the effect of ESG combined score (ESG_CS) on firm performance. The analysis shows that ESG_CS had no statistically significant effect on TBQ (B = .007, p >.10), also CEOSK has no statistically significant impact on TBQ (B = -.273, p >.10). Additionally, the study shows that the interaction effect of ESG_CS and CEOSK on TBQ was statistically insignificant. Hence, CEOSK cannot moderate the effect of ESG_CS on TBQ. Thus, $H2a_2$ is not supported.

Model 3 is designed to test H3a: Institutional ownership (INS) moderates the effect of ESG combined scores (ESG_CS) on firm performance. The analysis shows that ESG_CS had no statistically significant effect on TBQ (B = .007, p >.10), also INS had no statistically significant impact on TBQ (B = .008, p >.10). Additionally, the study shows that the interaction effect of ESG_CS and INS on TBQ was statistically insignificant. Hence, INS cannot moderate the effect of ESG_CS on TBQ. Thus, H3a is not supported.

Model 4 is designed to test $H4a_1$: BS moderates the effect of ESG combined score on firm performance. This model is designed with ESG_CS as the main effect and BS as the moderating effect. The analysis shows that ESG_CS had no statistically significant effect on TBQ (B = .007, p >.10), also BS had no statistically significant impact on TBQ (B = .017, p >.10). Interestingly, the regression coefficient for the product of ESG_CS and BS is negative and statistically significant at a level of .01 (B = -.005, $p < 0.01$), and the main effects of ESG_CS, BS, and all control variables account for approximately 10.63% of variance in support for TBQ. The results indicate that BS moderates the effect of ESG_CS on TBQ, which means that the effect of ESG_CS on TBQ depends on BS. Thus, $H4a_1$ is supported.

Model 5 is designed to test $H4a_2$: Board gender driver (BG) moderates the effect of ESG combined score (ESG_CS) on firm performance. The analysis shows that ESG_CS had no statistically significant effect on TBQ (B = .008, p >.10), also BG has no statistically significant impact on TBQ (B = .001, p >.10). Additionally, the study shows that the interaction effect of ESG_CS and BG on TBQ was statistically insignificant. Hence, BG cannot moderate the effect of ESG_CS on TBQ. Thus, $H4a_2$ is not supported.

According to the results in Table 4.4, Model 1: the effect of ESG_CS on TBQ depends on CEODU and Model 4: the effect of ESG_CS on TBQ depends on BS, further analysis proceeds on how CEODU affects the relationship between the ESG_CS on TBQ, and how BS affects the relationship between the ESG_CS on TBQ. This study employed the PROCESS macro for SPSS by Hayes (2018) and the results of model summary and conditional effects of ESG_CS on TBQ at different values of moderators: CEODU and BS are shown in Table 4.5 and Table 4.6, and the graphs are plotted as shown in Figure 4.1 and Figure 4.2, respectively.

Table 4.5 Model summary and condition effects of ESG_CS on TBQ at values of CEODU as the moderator

Model Summary

R	R2	MSE	F	df1	df2	p
.309	.095	1.565	2.370	7.000	157.000	.024

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.026	4.620	1	157	.030

Focal predict: ESG_CS(X), Mod var: CEODU (W)

CEODU	Effect	se	t	p	LLCI	ULCI
-.587	.021	.008	2.647	.008	.005	.037
.412	-.001	.007	-.171	.864	-.015	.013

Notes: CEODU -.587 refers to the dummy variable = 0, indicating non-CEO duality; CEODU .412 refers to the dummy variable = 1, indicating CEO duality.

Table 4.5 shows that when CEODU is at -.587 (non-CEO duality), the conditional effect of ESG_CS on TBQ is positive and statistically significant at a level of .01 (B = .021, *p* = .008), while when CEODU is at .412 (CEO duality), the conditional effect of ESG_CS on TBQ is insignificant at a level of .10 (B = -.001, *p* = .864).

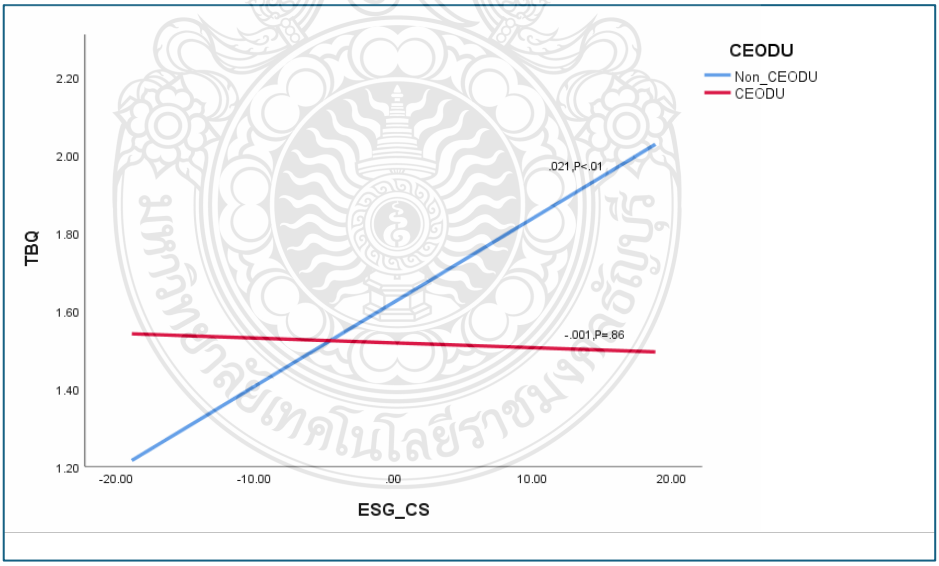

Figure 4.1 A visual representation of the moderating effect of CEODU on the relationship between ESG_CS and TBQ when CEODU = -.587 (non-CEO duality); and CEODU = .412 (CEO duality)

Figure 4.1 presents the graph to illustrate the conditional effects of ESG_CS on TBQ at the value of moderator, namely CEODU = -.587 (non-CEO duality) and CEODU =.412 (CEO duality). The blue line represents the effect of ESG_CS on TBQ when the company has non-CEO duality (CEODU = -.587). This line shows the statistically significant positive effect of ESG_CS on TBQ at a level of .01, as seen by the positive slope or the conditional effect of .021, p =.001. A higher ESG_CS would increase TBQ when the company has non-CEO duality. Additionally, the red line represents the effect of ESG_CS on TBQ when the company has CEO duality (CEODU = .412). This line shows a statistically insignificant effect of ESG_CS on TBQ, as seen by the negative slope or the conditional effect of -.001, p = .864. ESG_CS does not affect TBQ when the company has CEO duality, or the chairman and CEO of the company are the same people.

Table 4.6 Model summary and condition effects of ESG_CS on TBQ at values of BS as the moderator

Model Summary

R	R2	MSE	F	df1	df2	p
.326	.106	1.546	2.666	7.000	157.000	.012

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.033	5.842	1	157	.016

Focal predict: ESG_CS (X), Mod var: BS (W)

BS	Effect	se	t	p	LLCI	ULCI
-2.524	.023	.007	2.947	.007	.007	.038
.000	.006	.005	1.266	.239	-.003	.017
2.524	-.007	.008	.008	.399	-.026	.008

Notes: the value of BS: -2.524 refers to small BS which is 8.65 persons or one standard deviation below the mean value; 000 refers to the average BS which is 11.17 persons or at the mean value; and 2.524 refers to large BS which is 13.69 persons or one standard deviation above the mean value.

Table 4.6 shows the conditional effects of ESG_CS on TBQ at different levels of BS: (1) when BS (-2.524) is small (one standard deviation lower than the mean), the conditional effect is positive and statistically significant at a level of .01 (B = .023, p = .007); (2) when BS (.000) is at an average (the mean value), the conditional effect is no statistically significant (B = .006, p = .239); and (3) when BS (2.524) is large (one standard deviation above the mean), the conditional effect demonstrates no statistically significant (B = -.007, p = .399).

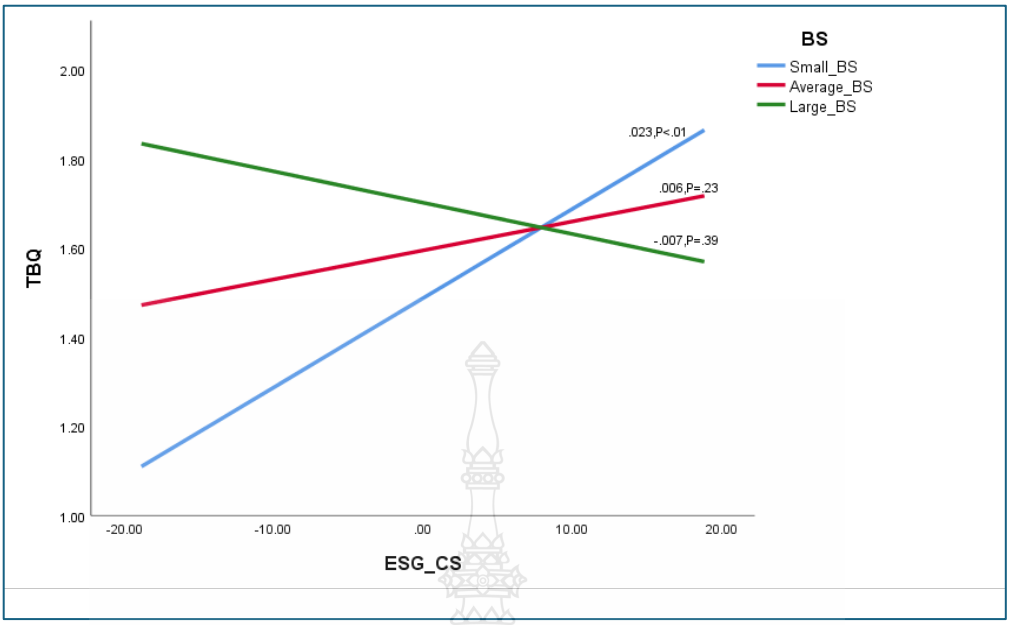

Figure 4.2 A visual representation of the moderating effect of BS on the relationship between ESG_CS and TBQ when BS = -2.524 (Small); BS = .000 (Average); and BS = 2.524 (Large)

Figure 4.2 illustrates the conditional effects of ESG_CS on TBQ at the value of moderator: BS = -2.524 (small), BS = .000 (average), and BS = 2.524 (large). The blue line represents the effect of ESG_CS on TBQ when the company has a small BS (BS = -2.524). This line shows the statistically significant positive effect of ESG_CS on TBQ at a level of .01, as seen by the positive slope or the conditional effect of .023. Therefore, when a company has a small board size, having more ESG_CS will increase TBQ. The red line represents the effect of ESG_CS on TBQ when a company has an average BS (BS = .000). This line shows no statistically significant effect of ESG_CS on TBQ. Moreover, the green line represents the conditional effect of ESG_CS on TBQ when a company has a large BS (BS = 2.524). This line shows no statistically significant effect of ESG_CS on TBQ. The results indicate that for companies with small board sizes, ESG_CS increases TBQ, while for companies with average or large board sizes, ESG_CS does not affect TBQ.

Table 4.7 Analysis results of the moderating effects of CEO duality, CEO skill, institutional ownership, board size, and board gender diversity on the relationship between environment score and Tobin's Q

Variable	Model 1.0		Model 1.1	Model 1.2	Model 1.3	Model 1.4	Model 1.5
	Model 1.01	Model 1.02	Moderation Models				
	Control	ENV	CEODU	CEOSK	INS	BS	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	1.777**	2.174***	2.597***	2.501***	2.686***	2.343***	2.652***
	(2.488)	(3.027)	(3.325)	(3.160)	(3.343)	(2.767)	(3.309)
Control Variables							
F_SIZE	-0.059	-0.125	-0.123	-0.118	-0.123	-0.086	-0.125
	(-0.842)	(-1.644)	(-1.639)	(-1.555)	(-1.590)	(-1.052)	(-1.604)
LEV	-0.102	-0.094	-0.083	-0.076	-0.093	-0.106	-0.092
	(-1.507)	(-1.405)	(-1.255)	(-1.131)	(-1.406)	(-1.602)	(-1.362)
AUD	0.655*	0.655*	0.637*	0.670*	0.541	0.591	0.589*
	(1.711)	(1.735)	(1.677)	(1.764)	(1.428)	(1.584)	(1.529)
DIND	-0.370*	-0.446**	-0.458**	-0.449**	-0.365*	-0.416**	-0.435*
	(-1.782)	(-2.141)	(-2.206)	(-2.148)	(-1.728)	(-1.939)	(-2.075)
Main Effect							
ENV		0.010**	0.009	0.009	0.008*	0.007	0.009
		(2.121)	(2.214)	(1.985)	(1.319)	(1.735)	(2.086)
CEODU			-0.022				
			(-0.109)				
CEOSK				-0.272			
				(-1.335)			
INS					0.009		
					(1.385)		
BS						0.032	
						(0.797)	
BG							0.001
							(0.109)
Interaction Effect							
ENV x CEODU			-0.017**				
			(-2.121)				
ENV x CEOSK				-0.005			
				(-0.607)			
ENV x INS					-0.001*		
					(-1.694)		
ENV x BS						-0.004***	
						(-2.551)	
ENV x INS							-0.000
							(0.890)
R	0.228	0.279	0.322	0.301	0.322	0.340	0.288
R^2	0.052	0.078	0.103	0.091	0.104	0.115	0.083
R^2 change	0.006	0.078	0.025	0.002	0.016	0.036	0.004
F	2.193	2.692**	2.600**	2.236**	2.605**	2.940***	2.034**

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 165 for all models; unstandardized coefficients (B) are reported, and t statistics are reported in parentheses; 1) ENV: Environmental score; 2) CEODU: CEO duality; 3) CEOSK: CEO skill; 4) INS: Institutional ownership; 5) BS: Board size;
6) BG: Board gender diversity; 7) F_Size: Firm size; 8) LEV: Debt to equity; 9) AUD: Auditor type; and 8) DIND: Industry type.

According to Table 4.7, the main effect model (Model 1.02) revealed that ENV had a positive effect on TBQ at a statistically significant level of .01 (B = .010, p <.01). Thus, H1b: Environment scores have a positive effect on firm performance, is supported. Additionally, the control variables: firm size (F_size) and leverage (LEV) had no statistically significant effect on TBQ, whereas auditor type (AUD) and industry type (DIND) demonstrated statistically significant effects on TBQ. All control variables account for 5.20% of the variance in support for TBQ, whereas both ENV and all control variables account for 7.80% of the variance in support for TBQ.

The five regression models (Model 1.1 - Model 1.5) were analyzed and presented to assess the moderating effect of CEO duality (CEODU), CEO skill (CEOSK), institutional ownership (INS), board size (BS), and board gender diversity (BG), on the effect of ENV on TBQ.

Model 1.1 is designed to test $H2b_1$: CEO duality moderates the effect of Environmental score on firm performance. This model is designed with ENV as the main effect and CEODU as the moderate effect. The analysis shows that ENV had no statistically significant effect on TBQ (B = .009, p >.10), also CEODU had no significant impact on TBQ (B = -.002, p >.10). Interestingly, the regression coefficient for the product of ENV and CEODU is negative and statistically significant (B =-.017, p < 0.05). The main effects of ENV, CEODU, the interaction effect, and all control variables account for approximately 10.39% of the variance in support for TBQ. The results indicate that CEODU moderates the effect of ENV on TBQ, which means that the effect of ENV on TBQ depends on CEODU. Thus, $H2b_1$ is supported.

Model 1.2 is designed to test $H2b_2$: CEO skill (CEOSK) moderates the effect of Environmental score on firm performance. The analysis shows that ENV had no statistically significant effect on TBQ (B = .009, p >.10), also CEOSK had no significant impact on TBQ (B = -.005, p >.10). Additionally, the study shows that the interaction effect of ENV and CEOSK on TBQ was statistically insignificant. Hence, CEOSK cannot moderate the effect of ENV on TBQ. Thus, $H2b_2$ is not supported.

Model 1.3 is designed to test H3b: Institutional ownership (INS) moderates the effect of Environmental score (ENV) on firm performance. The analysis shows that ENV had a statistically significant effect on TBQ at a level of 0.05 (B = .008, p <.10), while INS has no

significant impact on TBQ (B = .009, p >.10). Interestingly, the regression coefficient for the product of ENV and INS is negative and statistically significant at a level of 0.05 (B = -.000, p < .10). The main effects of ENV, INS, the interaction effect and all control variables account for approximately 10.41% of variance in support for TBQ. The results indicate that INS moderates the effect of ENV on TBQ, which means that the effect of ENV on TBQ depends on INS. Thus, H3b is supported.

Model 1.4 is designed to test $H4b_1$: Board size (BS) moderates the effect of Environmental score (ENV) on firm performance. This model is designed with ENV as the main effect and BS as the moderating effect. The analysis shows that ENV had no statistically significant effect on TBQ (B = .007, p >.10), also BS had no significant impact on TBQ (B = .032, p >.10). Interestingly, the regression coefficient for the product of ENV and BS is negative and statistically significant at a level of 0.01 (B = -.004, p < 0.01). The main effects of ENV, BS, the interaction effect and all control variables account for approximately 11.59% of the variance in support for TBQ. The results indicate that BS moderates the effect of ENV on TBQ, which means that the effect of ENV on TBQ depends on BS. Thus, $H4b_1$ is supported.

Model 1.5 is designed to test $H4b_2$: Board gender diversity (BG) moderates the effect of Environmental score (ENV) on firm performance. The analysis shows that ENV had no statistically significant effect on TBQ (B = .009, p >.10), also BG had no significant impact on TBQ (B = .000, p >.10). Additionally, the study shows that the interaction effect of ENV and BG on TBQ was statistically insignificant. Hence, BG cannot moderate the effect of ENV on TBQ. Thus, $H4b_2$ is not supported.

According to the results in Table 4.7, the study found that: Model 1.1 - the effect of ENV on TBQ depends on CEODU; Model 1.3 - the effect of ENV on TBQ depends on INS; and Model 1.4 - the effect of ENV on TBQ depends on BS. Further analysis proceeds on how CEODU affects the relationship between the ENV and TBQ, how INS affects the relationship between the ENV and TBQ, and how BS affects the relationship between the ENV and TBQ. This study employed the PROCESS macro for SPSS by Hayes (2018) and the results of model summary and conditional effects of ENV on TBQ at different values of moderators: CEODU, INS, and BS are shown in Table 4.8, 4.9, and Table 4.10, and the graphs are plotted as shown in Figure 4.3, 4.4 and Figure 4.5, respectively.

Table 4.8 Model summary and condition effects of ENV on TBQ at values of CEODU as the moderator

Model Summary

R	R2	MSE	F	df1	df2	p
.325	.105	1.547	2.650	7.000	157.000	.012

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.025	4.480	1	157	.03

Focal predict: ENV (X), Mod var: CEODU (W)

CEODU	Effect	se	t	p	LLCI	ULCI
-.587	.020	.006	2.986	.003	.006	.033
.412	.002	.005	.495	.862	-.008	.013

Notes: CEODU -.587 refers to the dummy variable = 0, indicating non-CEO duality; CEODU .412 refers to the dummy variable = 1, indicating CEO duality.

Table 4.8 shows that when CEODU is at -.587 (non-CEO duality), the conditional effect of ENV on TBQ is positive and statistically significant at a level of .01 (B = .020, *p* = .003), while when CEODU is at .412 (CEO duality), the conditional effect of ENV on TBQ is no statistically significant (B = .002, *p* = .862).

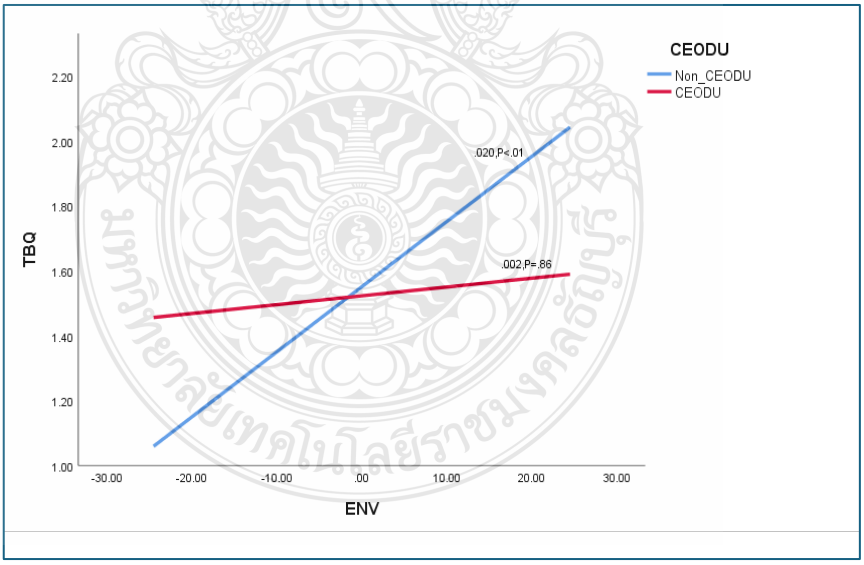

Figure 4.3 A visual representation of the moderating effect of CEODU on the relationship between ENV and TBQ when CEODU = -.587 (non-CEO duality); and CEODU = .412 (CEO duality)

Figure 4.3 presents the graph to illustrate the conditional effects of ENV on TBQ at the value of moderator, namely CEODU = -.587 (non-CEO duality) and CEODU =.412 (CEO duality). The blue line represents the effect of ENV on TBQ when a company has non-CEO duality (CEODU = -.587). This line shows a statistically significant positive effect of ENV on TBQ at a level of .01, as seen by the positive slope or the conditional effect of .020, p = .003. Therefore, higher ENV would increase TBQ when the company has non-CEO duality. Additionally, the red line represents the effect of ENV on TBQ when the company has CEO duality (CEODU =.412). This line shows a statistically insignificant effect of ENV on TBQ, as seen by the negative slope or the conditional effect of .002, p = .862. ENV does not affect TBQ when the company has CEO duality or the chairman and CEO of the company are the same people.

Table 4.9 Model summary and condition effects of ENV on TBQ at values of INS as the moderator

Model Summary

R	R2	MSE	F	df1	df2	p
.325	.106	1.547	2.665	7.000	157.000	.012

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.016	5.872	1	157	.091

Focal predict: ENV (X), Mod var: INS (W)

INS	Effect	se	t	p	LLCI	ULCI
-14.816	.015	.005	2.718	.007	.007	.038
.000	.007	.004	1.727	.084	-.003	.017
14.816	.000	.007	.020	.983	-.026	.008

Notes: the value of INS: -14.816 refers to a low level which is 2.28% or one standard deviation below the mean value; 000 refers to an average level which is 17.09% or at the mean value; and 14.816 refers to a high level which is 31.90% or one standard deviation above the mean value.

Table 4.9 shows the conditional effects of ENV on TBQ at different levels of INS: (1) when INS (-14.816) is at a low level (one standard deviation lower than the mean), the conditional effect is positive and statistically significant at a level of .01 (B = .015, p = .007); (2) when INS (.000) is at an average level (the mean value), the conditional effect is statistically significant at a level of 0.10 (B = .007, p = .084); and (3) when INS (14.816) is at a high level

(one standard deviation above the mean), the conditional effect demonstrates no statistically significant (B = .000, *p* = .983).

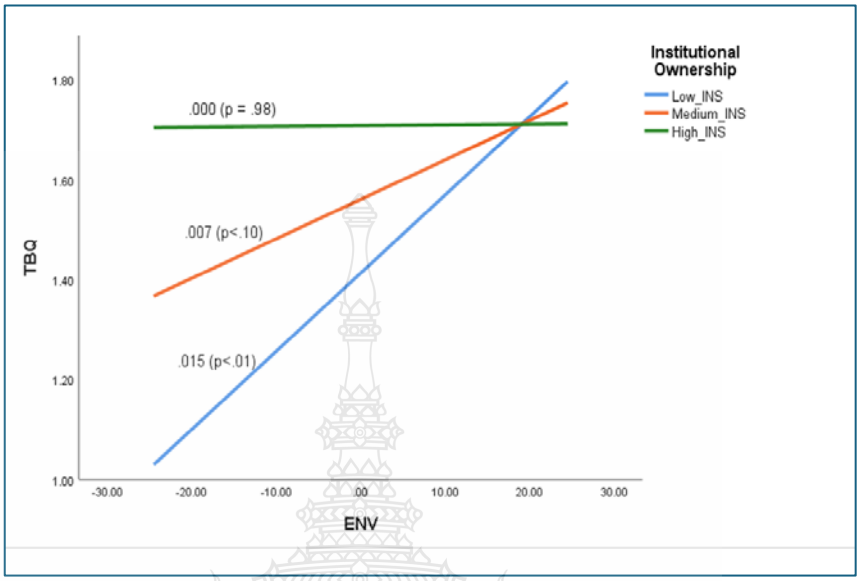

Figure 4.4 A visual representation of the moderating effect of INS on the relationship between ENV and TBQ when INS = -14.798 (Low); INS = .000 (Average); and INS = 14.816 (High)

Figure 4.4 illustrates the conditional effects of ENV on TBQ at the value of moderator: INS = -14.816 (low), INS= .000 (average) and INS =14.816 (high). The blue line represents the effect of ENV on TBQ when the company has low INS (INS = -14.816). This line shows the statistically significant positive effect of ENV on TBQ at a level of .01, as seen by the positive slope or the conditional effect of .015. The red line represents the effect of ENV on TBQ when the company has average INS (INS = .000). This line shows the statistical significance positive effect of ENV on TBQ at a level of .10, as seen by the positive slope or the conditional effect of .007. Therefore, higher ENV increases TBQ when the firm has a low level or average level of institutional ownership. However, the impact of ENV on TBQ is greater in a firm with a low level of INS than in a firm with an average INS. Moreover, the green line represents the conditional effect of ENV on TBQ when the company has a high level of INS (INS = 14.816). This line shows no statistically significant effect of ENV on TBQ. The findings indicate that when the institutional ownership of the company is at a low or average

level, ENV would increase firm performance (TBQ); but when a company has a high level of institutional ownership, ENV indicates no effect on TBQ.

Table 4.10 Model summary and condition effects of ENV on TBQ at values of BS as the moderator

Model Summary

R	R2	MSE	F	df1	df2	p
.330	.109	1.541	2.750	7.000	157.000	.010

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.025	4.503	1	157	.035

Focal predict: ENV (X), Mod var: BS (W)

BS	Effect	se	t	p	LLCI	ULCI
-2.524	.017	.005	2.920	.004	.005	.028
.000	.007	.004	1.727	.086	-.001	.016
2.524	-.001	.006	-.229	.818	-.018	.011

Notes: the value of BS: -2.524 refers to small BS which is 8.65 persons or one standard deviation below the mean value; 000 refers to the average BS which is 11.17 persons or at the mean value; and 2.524 refers to large BS which is 13.69 persons or one standard deviation above the mean value.

Table 4.10 shows the conditional effects of ENV on TBQ at different levels of BS: (1) when BS (-2.524) is small (one standard deviation lower than the mean), the conditional effect is positive and statistically significant at a level of .01 (B = .017, p = .004); (2) when BS (.000) is at an average (the mean value), the conditional effect is positive and statistically significant at a level of .10 (B = .007, p = .086); and (3) when BS (2.524) is large (one standard deviation above the mean), the conditional effect demonstrates no statistically significant (B = -.001, p = .818).

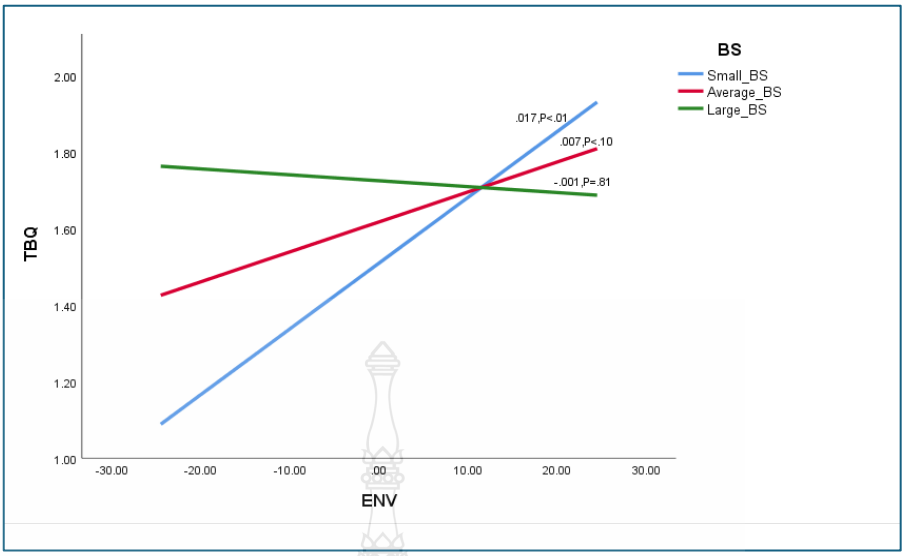

Figure 4.5 A visual representation of the moderating effect of BS on the relationship between ENV and TBQ when BS = -2.524 (Small); BS = .000 (Average); and BS = 2.524 (Large)

Figure 4.5 illustrates the conditional effects of ENV on TBQ at the value of moderator: BS = -2.524 (small), BS = .000 (average), and BS = 2.524 (large). The blue line represents the effect of ENV on TBQ when the company has a small BS (BS = -2.524). This line shows the statistically significant positive effect of ENV on TBQ at a level of .01, as seen by the positive slope or the conditional effect of .017. The red line represents the effect of ENV on TBQ when a company has an average BS (BS = .000). This line shows a statistically significant positive effect of ENV on TBQ at a level of .10, as seen by the positive slope or the conditional effect of .007. Therefore, higher ENV increases TBQ when a firm has a low level or average level of board size. However, the impact of ENV on TBQ is greater in firms with a low level of BS than in firms with an average BS. Moreover, the green line represents the conditional effect of ENV on TBQ when a company has a large BS (BS = 2.524). This line shows no statistically significant effect of ENV on TBQ. The results indicate that for a company with a large board size, ENV does not affect TBQ. In conclusion, higher ENV increases TBQ when a firm has a small BS, or an average BS; but the impact of ENV on TBQ is greater in a firm with a small BS than in a firm with an average BS. In contrast, when a firm has a large BS, ENV does not affect TBQ.

Table 4.11 Analysis results of the moderating effects of CEO duality, CEO skill, institutional ownership, board size and board gender diversity on the relationship between social score and Tobin's Q

Variable	Model 2.0		Model 2.1	Model 2.2	Model 2.3	Model 2.4	Model 2.5
	Model 2.01	Model 2.02	Moderation Models				
	Control	SOC	CEODU	CEOSK	INS	BS	BG
	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	1.777**	1.864***	2.316***	2.190***	2.221***	2.090**	2.364***
	(2.488)	(2.622)	(2.978)	(2.757)	(2.756)	(2.447)	(2.975)
Control Variables							
F_SIZE	-0.059	-0.102	-0.094	-0.090	-0.081	-0.068	-0.099
	(-0.842)	(-0.842)	(-1.253)	(-1.182)	(-1.038)	(-0.827)	(-1.282)
LEV	-0.102	-0.105	-0.111*	-0.092	-0.100	-0.096	-0.107
	(-1.507)	(-1.561)	(-1.664)	(-1.342)	(-1.495)	(-1.445)	(-1.565)
AUD	0.655*	0.640*	0.622	0.683*	0.582	0.599	0.602
	(1.711)	(1.682)	(1.620)	(1.773)	(1.529)	(1.583)	(1.551)
DIND	-0.370*	-0.376*	-0.372*	-0.395*	-0.317	-0.358*	-0.368*
	(-1.782)	(1.818)	(-1.803)	(-1.900)	(-1.511)	(-1.669)	(-1.767)
Main Effect							
SOC		0.008	0.008	0.006	0.004	0.005	0.009
		(1.492)	(1.559)	(1.140)	(0.708)	(0.880)	(1.566)
CEODU			-0.060				
			(-0.300)				
CEOSK				-0.271			
				(-1.302)			
INS					0.009		
					(1.342)		
BS						0.024	
						(0.602)	
BG							0.002
							(0.257)
Interaction Effect							
SOC x CEODU			-0.018 *				
			(-1.851)				
SOC x CEOSK				0.001			
				(0.102)			
SOC x INS					-0.001*		
					(-1.651)		
SOC x BS						0.042	
						(0.893)	
SOC x BG							-0.000
							(-0.428)
R	0.228	0.255	0.292	0.274	0.295	0.301	0.258
R^2	0.052	0.065	0.085	0.075	0.087	0.091	0.067
R^2 change	0.006	0.059	0.020	0.000	0.015	0.025	0.001
F	2.193	2.213	2.098**	1.820*	2.151**	2.249**	1.609

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 165 for all models; unstandardized coefficients (B) are reported, and t statistics are reported in parentheses; 1) SOC: Social score; 2) CEODU: CEO duality; 3) CEOSK: CEO skill; 4) INS: Institutional ownership; 5) BS: Board size; 6) BG: Board gender diversity; 7) F_Size: Firm size; 8) LEV: Debt to equity; 9) AUD: Auditor type; and 8) DIND: Industry type.

According to Table 4.11, the main effect model (Model 2.02) revealed that SOC had no statistically significant effect on TBQ (B = .008, $p > .10$). Thus, H2c – Social score has a positive effect on firm performance, which is not supported. Additionally, the

control variables: firm size (F_size) and leverage (LEV) had no statistically significant effect on TBQ, whereas auditor type (AUD) and industry type (DIND) demonstrated statistically significant effects on TBQ at a level of 0.10. All control variables account for 5.20% of the variance in support for TBQ, whereas both SOC and all control variables account for 6.50% of the variance in support for TBQ.

The five regression models (Model 2.1 – Model 2.5) were analyzed and presented to assess the moderating effect of CEO duality (CEODU), CEO skill (CEOSK), institutional ownership (INS), board size (BS) and board gender diversity (BG), on the effect of SOC on TBQ.

Model 2.1 is designed to test H2c1: CEO duality (CEODU) moderates the effect of social score (SOC) on firm performance. This model is designed with SOC as the main effect and CEODU as the moderating effect. The analysis shows that SOC had no statistically significant effect on TBQ (B = .008, p >.10), also CEODU has no statistically significant impact on TBQ (B = -.060, p >.10). Interestingly, the regression coefficient for the product of SOC and CEODU is negative and statistically significant at a level of 0.10 (B = -.018, p < .10). The main effects of SOC, CEODU, the interaction effect and all control variables account for approximately 8.55% of variance in support for TBQ. The results indicate that CEODU moderates the effect of SOC on TBQ, which means that the effect of SOC on TBQ depends on CEODU. Thus, $H2c_1$ is supported.

Model 2.2 is designed to test $H2c_2$: CEO skill (CEOSK) moderates the effect of social score (SOC) on firm performance. This model is designed with SOC as the main effect and CEOSK as the moderating effect. The analysis shows that SOC had no statistically significant effect on TBQ (B = .006, p >.10), also CEOSK had no statistically significant impact on TBQ (B = -.271, p >.10). Interestingly, the regression coefficient for the product of SOC and CEOSK is statistically insignificant at a level of 0.10 (B = .001, p > .10). The main effects of SOC, CEOSK, the interaction effect and all control variables account for approximately 7.51% of variance in support for TBQ. The results indicate that CEOSK does not moderate the effect of SOC on TBQ, which means that the effect of SOC on TBQ does not depend on CEOSK. Thus, $H2c_2$ is not supported.

Model 2.3 is designed to test H3c: Institutional ownership (INS) moderates the effect of social score (SOC) on firm performance. This model is designed with SOC as

the main effect and INS as the moderating effect. The analysis shows that SOC had no statistically significant effect on TBQ (B = .004, p >.10), also INS had no statistically significant impact on TBQ (B = .009, p >.10). Interestingly, the regression coefficient for the product of SOC and INS is statistically significant at a level of 0.10 (B =-.001, p < .10). The main effects of SOC, INS, the interaction effect and all control variables account for approximately 8.75% of the variance in support for TBQ. The results indicate that INS moderates the effect of SOC on TBQ, which means that the effect of SOC on TBQ depends on INS. Thus, H3c is supported.

Model 2.4 is designed to test $H4c_1$: Board size (BS)moderates the effect of social score (SOC) on firm performance. This model is designed with SOC as the main effect and BS as the moderating effect. The analysis shows that SOC had no statistically significant effect on TBQ (B = .005, p >.10), also BS had no significant impact on TBQ (B = .024, p >.10). Additionally, the regression coefficient for the product of SOC and BS is statistically insignificant at a level of 0.10 (B =.042, p >.10). The main effects of SOC, BS, the interaction effect and all control variables account for approximately 9.11% of variance in support for TBQ. The results indicate that BS does not moderate the effect of SOC on TBQ, which means that the effect of SOC on TBQ does not depend on BS. Thus, $H4c_1$ is not supported.

Model 2.5 is designed to test $H4c_2$: Board gender diversity (BG) moderates the effect of social score (SOC) on firm performance. This model is designed with SOC as the main effect and BG as the moderating effect. The analysis shows that SOC had no statistically significant effect on TBQ (B = .009, p >.10), also BG had no significant impact on TBQ (B = .002, p >.10). Additionally, the regression coefficient for the product of SOC and BG is statistically insignificant at a level of 0.10 (B = .0001, p > .10). The main effects of SOC, BG, the interaction effect and all control variables account for approximately 6.70% of the variance in support for TBQ. The results indicate that BG does not moderate the effect of SOC on TBQ, which means that the effect of SOC on TBQ does not depend on BG. Thus, $H4c_2$ is not supported.

According to the results in Table 4.11, the study found that: Model 2.1 - the effect of SOC on TBQ depends on CEODU, and Model 2.3 - the effect of SOC on TBQ depends on INS. Therefore, further analysis proceeds on how CEODU affects the relationship between the

SOC on TBQ and how INS affects the relationship between the SOC on TBQ. This study employed the PROCESS macro for SPSS by Hayes (2018) and the results of model summary and conditional effects of SOC on TBQ at different values of moderators: CEODU and INS are shown in Table 4.12 and 4.13, and the graphs are plotted as shown in Figure 4.6, and 4.7, respectively.

Table 4.12 Model summary and condition effects of SOC on TBQ at values of CEODU as the moderator

Model Summary

R	R2	MSE	F	df1	df2	p
.295	.087	1.547	2.650	7.000	157.000	.041

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.025	4.480	1	157	.06

Focal predict: SOC (X), Mod var: CEODU (W)

CEODU	Effect	se	t	p	LLCI	ULCI
-.587	.019	.008	2.370	.019	.003	.036
.412	.000	.007	.129	.897	-.008	.014

Notes: CEODU -.587 refers to the dummy variable = 0, indicating non-CEO duality; CEODU .412 refers to the dummy variable = 1, indicating CEO duality.

Table 4.12 shows that when CEODU is at -.587 (non-CEO duality), the conditional effect of SOC on TBQ is positive and statistically significant at a level of .05 (B = .019, *p* = .019), while when CEODU is at .412 (CEO duality), the conditional effect of SOC on TBQ is not statistically significant at a level of .10 (B = .000, *p* = .897)

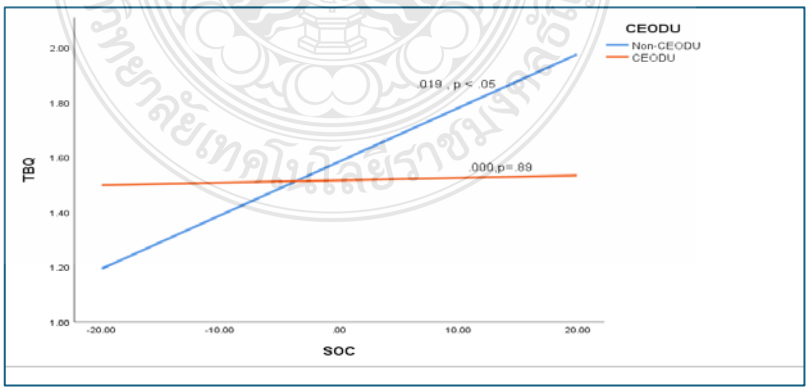

Figure 4.6 A visual representation of the moderating effect of CEODU on the relationship between SOC and TBQ when CEODU = -.587 (non-CEO duality); and CEODU = .412 (CEO duality)

Figure 4.6 presents the graph to illustrate the conditional effects of SOC on TBQ at the value of moderator, namely CEODU = -.587 (non-CEO duality) and CEODU = .412 (CEO duality). The blue line represents the effect of SOC on TBQ when the company has non-CEO duality (CEODU = -.587). This line shows the statistically significant positive effect of SOC on TBQ at a level of .05, as seen by the positive slope or the conditional effect of .019, p =.019. Therefore, higher SOC would increase TBQ when the company has non-CEO duality. Additionally, the red line represents the effect of SOC on TBQ when the company has CEO duality (CEODU = .412). This line shows a statistically insignificant effect of SOC on TBQ at a level of .10, as seen by the conditional effect of .000, p = .897. SOC does not affect TBQ when the company has CEO duality or the chairman and CEO of the company are the same people.

Table 4.13 Model summary and condition effects of SOC on TBQ at values of INS as the moderator

Model Summary

R	R2	MSE	F	df1	df2	p
.300	.090	1.574	2.222	7.000	157.000	.035

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.016	2.816	1	157	.095

Focal predict: SOC (X), Mod var: INS (W)

INS	Effect	se	t	p	LLCI	ULCI
-14.816	.014	.006	2.029	.044	.000	.027
.000	.004	.004	.685	.494	-.007	.015
14.816	-.005	.009	-.612	.541	-.026	.013

Notes: the value of INS: -14.816 refers to a low level which is 2.28% or one standard deviation below the mean value; 000 refers to an average level which is 17.09% or at the mean value; and 14.816 refers to a high level which is 31.90% or one standard deviation above the mean value.

Table 4.13 shows the conditional effects of SOC on TBQ at different levels of INS: (1) when INS (-14.816) is at a low level (one standard deviation lower than the mean), the conditional effect is positive and statistically significant at a level of .05 (B = .014, p = .044); (2) when INS (.000) is at an average level (the mean value), the conditional effect is no statistically significant (B = .004, p = .494); and (3) when INS (14.816) is at a high level (one standard deviation above the mean), the conditional effect demonstrates no statistically significant (B = -.005, p = .541).

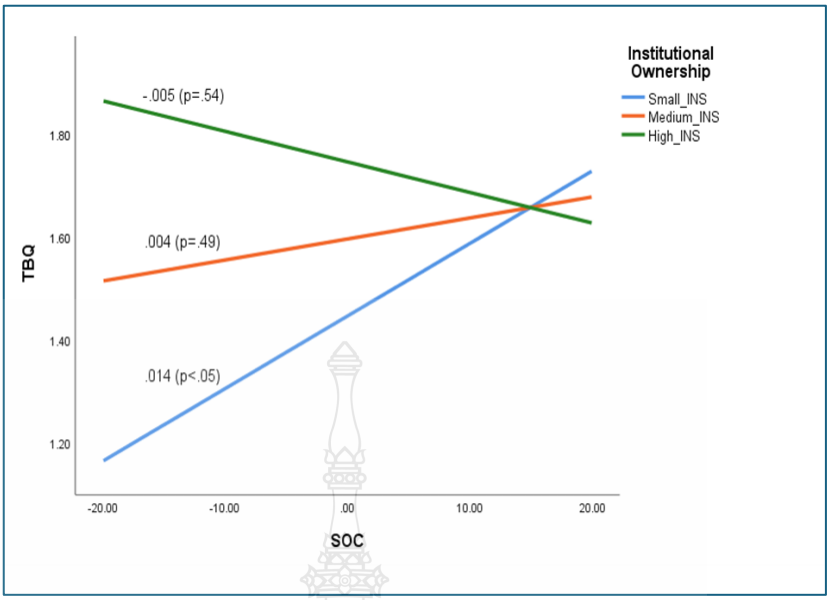

Figure 4.7 A visual representation of the moderating effect of INS on the relationship between SOC and TBQ when INS = -14.816 (Low); INS = .000 (Average); and INS = 14.816 (High)

Figure 4.7 illustrates the conditional effects of SOC on TBQ at the value of moderator: INS = -14.816 (low), INS= .000 (average) and INS =14.816 (high). The blue line represents the effect of SOC on TBQ when the company has low INS (INS = -14.816). This line shows the statistically significant positive effect of SOC on TBQ at a level of .05, as seen by the positive slope or the conditional effect of .014. Therefore, higher SOC increases TBQ when a firm has a low institutional ownership. On the contrary, the red line represents the effect of SOC on TBQ when the company has average INS (INS = .000). This line shows no statistically significant effect of SOC on TBQ at a level of .10, as seen by the conditional effect of .004, p = .49. Moreover, the green line represents the conditional effect of SOC on TBQ when the company has high INS (INS = 14.816). This line shows no statistically significant effect of SOC on TBQ. The findings indicate that when the institutional ownership of the company is at a low or average level, SOC does not affect TBQ.

Table 4.14 Analysis Results of the moderating effects of CEO duality, CEO skill, institutional ownership, board size, and board gender diversity on the relationship between Governance score and Tobin's Q

Variable	Model 3.0		Model 3.1	Model 3.2	Model 3.3	Model 3.4	Model 3.5
	Model 3.01	Model 3.02	Moderations Model				
	Control	GOV	CEODU	CEOSK	INS	BS	BG
	B(t)	B(t)	B (t)	B (t)	B (t)	B (t)	B (t)
Constant	1.777**	1.669**	1.903 ***	2.042***	2.162***	2.040 **	1.988***
	(2.488)	(2.250)	(2.649)	(2.816)	(2.928)	(2.532)	(2.682)
Control Variables							
F_SIZE	-0.059	-0.102	-0.058	-0.072	-0.077	-0.066	-0.062
	(-0.842)	(-1.348)	(-0.832)	(-1.024)	(-1.085)	(-0.855)	(-0.849)
LEV	-0.102	-0.105	-0.095	-0.076	-0.101	-0.114 *	-0.101
	(-1.507)	(-1.561)	(-1.407)	(-1.130)	(-1.497)	(-1.652)	(-1.472)
AUD	0.655 *	0.640*	0.640*	0.598	0.562	0.612	0.606
	(1.711)	(-0.842)	(1.649)	(1.562)	(1.459)	(1.593)	(1.565)
DIND	-0.370*	-0.376	-0.375*	-0.386*	-0.342	-0.410 *	-0.405 *
	(-1.782)	(-0.842)	(-1.794)	(-1.864)	(-1.592)	(-1.877)	(-1.898)
Main Effect							
GOV		0.005	0.005	0.004	0.005	0.005	0.005
		(1.074)	(1.062)	(1.010)	(1.019)	(0.999)	(1.067)
CEODU			-0.095				
			(-0.461)				
CEOSK				-0.306			
				(-1.507)			
INS					0.008		
					(1.208)		
BS						0.013	
						(0.310)	
BG							-0.000
							(-0.116)
Interaction Effect							
GOV x CEODU			-0.009				
			(-0.970)				
GOV x CEOSK				-0.014			
				(-1.468)			
GOV x INS					0.000		
					(0.277)		
GOV x BS						-0.003*	
						(-1.700)	
GOV x BG							-0.000
							(-0.467)
R	0.228	0.243	0.255	0.256	0.261	0.292	0.245
R^2	0.052	0.059	0.065	0.065	0.068	0.085	0.060
R^2 change		0.006	0.005	0.004	0.000	0.012	0.001
F	2.193	1.987	1.571	1.577	1.646	2.096**	1.437

Notes: Significant at *$p<.10$, **$p<.05$ and ***$p<.01$; n = 165 for all models; unstandardized coefficients (B) are reported, and t statistics are reported in parentheses; 1) GOV: Governance score; 2) CEODU: CEO duality; 3) CEOSK: CEO skill; 4) INS: Institutional ownership; 5) BS: Board size; 6) BG: Board gender diversity; 7) F_Size: Firm size; 8) LEV: Debt to equity; 9) AUD: Auditor type; and 8) DIND: Industry type.

According to Table 4.14, the main effect model (Model 3.02) revealed that GOV had no statistically significant effect on TBQ (B = .005, $p > .10$). Thus, H2d – Governance score has a positive effect on firm performance, which is not supported. Additionally, the

control variables: firm size (F_size), leverage (LEV), and industry type (DIND) had no statistically significant effect on TBQ, whereas auditor type (AUD) demonstrated statistically significant effects on TBQ at a level of 0.10. All control variables account for 5.20% of the variance in support for TBQ, whereas both GOV and all control variables account for 5.90% of the variance in support for TBQ.

The five regression models (Model 3.1 – Model 3.5) were analyzed and presented to assess the moderating effect of CEO duality (CEODU), CEO skill (CEOSK), institutional ownership (INS), board size (BS) and board gender diversity (BG), on the effect of GOV on TBQ, to test the five hypotheses.

Model 3.1 is designed to test $H2d_1$: CEO duality moderates the effect of Governance score on firm performance. This model is designed with GOV as the main effect and CEODU as the moderating effect. The analysis shows that GOV had no statistically significant effect on TBQ (B = .005, $p > .10$), also CEODU had no significant impact on TBQ (B = -.095, $p > .10$). Additionally, the regression coefficient for the product of GOV and CEODU is statistically insignificant at a level of 0.10 (B =.009, $p > .10$). The main effects of GOV, CEODU, the interaction effect and all control variables account for approximately 6.55% of variance in support for TBQ. The results indicate that CEODU does not moderate the effect of GOV on TBQ, which means that the effect of GOV on TBQ does not depend on CEODU. Thus, $H2d_1$ is not supported.

Model 3.2 is designed to test $H2d_2$: CEO skill (CEOSK) moderates the effect of Governance score on firm performance. This model is designed with GOV as the main effect and CEOSK as the moderating effect. The analysis shows that GOV had no statistically significant effect on TBQ (B = .005, $p > .10$), also CEOSK had no significant impact on TBQ (B = -.306, $p > .10$). Additionally, the regression coefficient for the product of GOV and CEOSK is statistically insignificant at a level of 0.10 (B = -.014, $p > .10$). The main effects of GOV, CEOSK, the interaction effect, and all control variables account for approximately 6.57% of variance in support for TBQ. The results indicate that CEOSK does not moderate the effect of GOV on TBQ, which means that the effect of GOV on TBQ does not depend on CEOSK. Thus, $H2d_2$ is not supported.

Model 3.3 is designed to test H3d: Institutional ownership (INS) moderates the effect of Governance score on firm performance. This model is designed with GOV as

the main effect and INS as the moderating effect. The analysis shows that GOV had no statistically significant effect on TBQ (B = .005, $p > .10$), also INS had no statistically significant impact on TBQ (B = .008, $p > .10$). Additionally, the regression coefficient for the product of GOV and INS is statistically insignificant at a level of 0.10 (B = .0001, $p > .10$). The main effects of GOV, INS, the interaction effect, and all control variables account for approximately 6.84% of variance in support for TBQ. The results indicate that INS does not moderate the effect of GOV on TBQ, which means that the effect of GOV on TBQ does not depend on INS. Thus, H3d is not supported.

Model 3.4 is designed to test $H4d_1$: Board size (BS) moderates the effect of Governance score on firm performance. This model is designed with GOV as the main effect and BS as the moderating effect. The analysis shows that GOV had no statistically significant effect on TBQ (B = .005, $p > .10$), also BS had no statistically significant impact on TBQ (B = .013, $p > .10$). Interestingly, the regression coefficient for the product of GOV and BS is statistically significant at a level of 0.10 (B = -.003, $p < .10$). The main effects of GOV, BS, the interaction effect, and all control variables account for approximately 8.55% of the variance in support for TBQ. The results indicate that BS moderates the effect of GOV on TBQ, which means that the effect of GOV on TBQ depends on BS. Thus, $H4d_1$ is supported.

Model 3.5 is designed to test $H4d_2$: Board gender diversity (BG) moderates the effect of Governance score on firm performance. This model is designed with GOV as the main effect and BG as the moderating effect. The analysis shows that GOV had no statistically significant effect on TBQ (B = .005, $p > .10$), also BG had no statistically significant impact on TBQ (B = -.000, $p > .10$). Additionally, the regression coefficient for the product of GOV and BG is statistically insignificant at a level of 0.10 (B = -.000, $p > .10$). The main effects of GOV, BG, the interaction effect, and all control variables account for approximately 6.02% of variance in support for TBQ. The results indicate that BG does not moderate the effect of GOV on TBQ, which means that the effect of GOV on TBQ does not depend on BG. Thus, $H4d_2$ is not supported.

According to the results in Table 4.13, the study found that Model 3.4 - the effect of GOV on TBQ depends on BS. Therefore, further analysis proceeds on how BS affects the relationship between the GOV on TBQ. This study employed the PROCESS

macro for SPSS by Hayes (2018) and the results of model summary and conditional effects of GOV on TBQ at different values of BS as moderator are shown in Table 4.15 and the graphs are plotted as shown in Figure 4.8, respectively.

Table 4.15 Model summary and condition effects of GOV on TBQ at values of BS as the moderator

Model Summary

R	R2	MSE	F	df1	df2	p
.294	.086	1.581	2.123	7.000	157.000	.044

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.016	2.891	1	157	.09

Focal predict: GOV (X), Mod var: BS (W)

BS	Effect	se	t	p	LLCI	ULCI
-2.524	.014	.006	2.087	.038	.000	.027
.000	.005	.005	1.134	.258	-.004	.015
2.524	-.002	.007	-.395	.693	-.017	.011

Notes: the value of BS: -2.524 refers to small BS which is 8.65 persons or one standard deviation below the mean value; 000 refers to the average BS which is 11.17 persons or at the mean value; and 2.524 refers to large BS which is 13.69 persons or one standard deviation above the mean value.

Table 4.15 shows the conditional effects of GOV on TBQ at different levels of BS: (1) when BS (-2.524) is small (one standard deviation lower than the mean), the conditional effect is positive and statistically significant at a level of .05 (B = .014, p = .038); (2) when BS (.000) is at an average (the mean value), the conditional effect is no statistically significant at a level of .10 (B = .005, p = .258); and (3) when BS (2.524) is large (one standard deviation above the mean), the conditional effect demonstrates no statistically significant (B = -.002, p = .693).

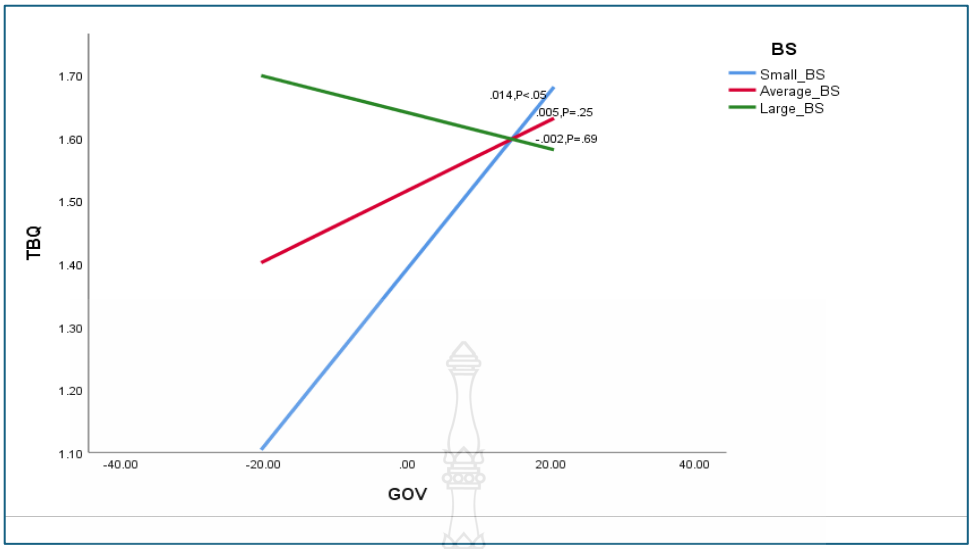

Figure 4.8 A visual representation of the moderating effect of BS on the relationship between GOV and TBQ when BS = -2.524 (Small); BS = .000 (Average); and BS = 2.524 (Large)

Figure 4.8 illustrates the conditional effects of GOV on TBQ at the values of a moderator: BS = -2.524 (small), BS = .000 (average), and BS = 2.524 (large). The blue line represents the effect of GOV on TBQ when the company has a small BS (BS = -2.524). This line shows the statistically significant positive effect of GOV on TBQ at a level of .05, as seen by the positive slope or the conditional effect of .014. The results indicate that for a company with a low board size, GOV positively affects TBQ. The red line represents the effect of GOV on TBQ when a company has an average BS (BS = .000). This line shows no statistically significant effect of GOV on TBQ. Moreover, the green line represents the conditional effect of GOV on TBQ when a company has a large BS (BS = 2.524). This line shows no statistically significant effect of GOV on TBQ. The results indicate that for a company with an average or a large board size, GOV does not affect TBQ. In conclusion, higher GOV increases TBQ when a firm has a small BS; but when a firm BS is at an average or a large BS, ENV does not affect TBQ.

4.4 Summary of Hypotheses Testing

The hypothesis testing results on the study of the moderating roles of CEO power, institutional ownership, and board characteristics on the relationship between ESG scores and firm performance, are summarized in Table 4.16 as follows.

Table 4.16 Summary of research hypotheses

Hypotheses	Results
Hypothesis 1: ESG disclosure scores affect firm performance	
H_{1a}: ESG combined score has a positive effect on firm performance	Rejected
H_{1b}: Environmental score has a positive effect on firm performance	Accepted
H_{1c}: Social score has a positive effect on firm performance	Rejected
H_{1d}: Governance score has a positive effect on firm performance	Rejected
Hypothesis 2: CEO power moderates the effect of ESG disclosure scores on firm performance	
H2a: CEO power moderates the effect of ESG combined score on firm performance	
$H2a_1$: CEO duality moderates the effect of ESG combined score on firm performance	Accepted
$H2a_2$: CEO skill moderates the effect of ESG combined score on firm performance	Rejected
H2b: CEO power moderates the effect of Environmental score on firm performance	
$H2b_1$: CEO duality moderates the effect of Environmental score on firm performance	Accepted
$H2b_2$: CEO skill moderates the effect of Environmental score on firm performance	Rejected
H2c: CEO power moderates the effect of Social score on firm performance.	
$H2c_1$: CEO duality moderates the effect of Social score on firm performance	Accepted
$H2c_2$: CEO skill moderates the effect of Social score on firm performance	Rejected
H2d: CEO power moderates the effect of Governance score on firm performance	
$H2d_1$: CEO duality moderates the effect of Governance score on firm performance	Rejected
$H2d_2$: CEO skill moderates the effect of Governance score on firm performance	Rejected
Hypothesis 3: Institutional ownership moderates the effect of ESG disclosure scores on firm performance	
H3a: Institutional ownership moderates the effect of ESG combined score on firm performance	Rejected

Table 4.16 Summary of research hypotheses (Cont.)

Hypotheses	Results
H3b: Institutional ownership moderates the effect of Environmental score on firm performance	Accepted
H3c: Institutional ownership moderates the effect of Social score on firm performance	Accepted
H3d: Institutional ownership moderates the effect of Governance score on firm performance	Rejected
Hypothesis 4: Board Characteristics moderate the effect of ESG disclosure scores on firm performance	
H4a: Board Characteristics moderate the effect of ESG combined score on firm performance	
H4a$_1$: Board size moderates the effect of ESG combined score on firm performance	Accepted
H4a$_2$: Board gender moderates the effect of ESG combined score on firm performance	Rejected
H4b: Board Characteristics moderate the effect of Environmental score on firm performance	
H4b$_1$: Board size moderates the effect of Environmental score on firm performance	Accepted
H4b$_2$: Board gender moderates the effect of Environmental score on firm performance	Rejected
H4c: Board Characteristics moderate the effect of Social score on firm performance	
H4c$_1$: Board size moderates the effect of Social score on firm performance	Rejected
H4c$_2$: Board gender moderates the effect of Social score on firm performance	Rejected
H4d: Board Characteristics moderate the effect of Governance score on firm performance	
H4d$_1$: Board size moderates the effect of Governance score on firm performance	Accepted
H4d$_2$: Board gender moderates the effect of Governance score on firm performance	Rejected

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

This chapter consists of three main sections. It includes the conclusion, discussion, and recommendations. The research contributions, limitations, and suggestions for future research are also presented.

5.1 Conclusions

The purposes of this study were to investigate the impact of the environmental, social and governance (ESG) activities on firm performance, and to examine the moderating roles of CEO power: CEO duality and CEO skill, institutional ownership, and board characteristics: board size and board gender diversity, on the relationship between ESG activities and firm performance. The research method used in this study was quantitative research, and purposive sampling was employed to select a specific group of sustainable stocks listed on the Thailand Sustainability Investment (THSI) index. The samples consisted of 165 companies from 168 companies listed on the THSI index in 2022, of which 85 companies were in the sensitive industry group: Industrials, Property & Construction, Resources, and Technology; and 80 companies were in the non-sensitive industry group: Argo & Food Industry, Consumer Products, Financials, and Services. The independent variable of ESG disclosure scores was collected from the data provided by LSEG (formerly Refinitiv) to measure ESG activities, both as overall ESG combined scores and as Environment, Social, and Governance pillar scores. In addition, the dependent, moderating, and control variables were collected from the financial statements and annual reports (56-1 One Report) of the sample companies as well as information from the online database of the Securities and Exchange Commission (SEC) and the Stock Exchange of Thailand Analysis and Reporting Tools (SETSMART). Statistical methods used to analyze the data included multiple linear regression and Hayes's regression-based analysis.

This study aimed to answer the research questions as follows.

(1) Do ESG disclosure scores positively affect firm performance?

(2) Do CEO power, institutional ownership, and board of directors' characteristics

moderate the relationship between ESG disclosure scores and firm performance, and how do they moderate?

Based on the above research questions and objectives, the four hypotheses were proposed as follows.

Hypothesis 1: ESG disclosure scores, namely ESG combined score (ESG_CS), Environmental pillar score (ENV), Social pillar score SOC), and Governance pillar score GOV), have a positive effect on firm performance (Tobin's Q).

Hypothesis 2: CEO power, namely CEO duality (CEODU) and CEO skill (CEOSK), moderates the effect of ESG disclosure scores on Tobin's Q.

Hypothesis 3: Institutional ownership (INS) moderates the effect of ESG disclosure scores on Tobin's Q.

Hypothesis 4: Board of directors' characteristics, namely board size (BS) and board gender diversity (BG), moderate the effect of ESG disclosure scores on Tobin's Q.

The study revealed the significant findings as follows.

(1) Effect of ESG disclosure scores on firm performance

The study found that ESG disclosure scores, including ESG combined score (ESG_CS), as well as Social pillar score (SOC), and Governance pillar score GOV), demonstrated no statistically significant effect on firm market-based performance. Interestingly, only the ENV pillar score positively affects firm market-based performance. Therefore, if a company does more environmental activities; it will result in higher firm market-based performance as measured by Tobin's Q ratio.

(2) Moderating roles of CEO power: CEO duality, and CEO skills, on the relationship between ESG disclosure scores and firm performance.

The study results indicated that CEO duality moderates: 1) the effect of ESG combined scores on firm market-based performance, 2) the effect of Environmental pillar scores on firm market-based performance, and 3) the effect of Social pillar scores on firm market-based performance. In particular, in a non-CEO duality firm, the conditional effect of the ESG combined scores, the Environmental pillar scores, and the Social pillar scores, on firm performance are positive and statistically significant. Specifically, more ESG combined activities, environmental activities, and social activities would increase market-based performance for a non-CEO duality firm. Additionally, the study found that

Governance pillar scores did not affect firm performance in a non-CEO duality firm. Also, CEO skills did not have a moderating effect on these relationships.

(3) Moderating role of institutional ownership on the relationship between ESG disclosure scores and firm performance.

The study results showed that institutional ownership moderates the effect of Environmental pillar scores on firm market-based performance. In particular, in a firm with a low level and average level of institutional ownership, the conditional effect of the Environmental pillar scores on firm performance is positive and statistically significant. Still, it has a more positive effect on a firm with a low level of institutional ownership than a firm with institutional ownership at an average level. Specifically, the environmental activities would increase firm market-based performance in a firm with a low, and average level of institutional ownership. Still, it increases the firm's performance more significantly in a low institutional ownership level firm than in a firm with an average institutional ownership level. Interestingly, the environmental activities did not affect firm performance for a high institutional ownership level firm.

Moreover, the study also found that institutional ownership moderates the effect of social pillar scores on firm market-based performance. In particular, in a firm with a low level of institutional ownership, the conditional effect of the social pillar scores on firm performance is positive and statistically significant; but for a company with institutional ownership at an average level and a high level, social activities do not affect its performance. Interestingly, the social activities would increase firm market-based performance only in a firm with a low level of institutional ownership.

(4) Moderating roles of the board of directors' characteristics: board size, and board gender diversity, on the relationship between ESG disclosure scores and firm performance.

The study found that board size moderates the effect of ESG combined scores, and governance pillar scores, on firm market-based performance. In particular, in a firm with a small board size, the conditional effect of the ESG combined scores and governance pillar scores, on firm performance is positive and statistically significant. Still, for a company with an average or a large board size, both the ESG combined activities and the governance activities, do not affect its market-based performance.

Interestingly, the ESG combined activities, and governance activities, would increase firm market-based performance only in a small board-size firm.

The study also indicated that board size moderates the effect of Environmental pillar scores on firm market-based performance. In particular, in a firm with a small or an average board size, the conditional effect of the Environmental pillar scores on firm performance is positive and statistically significant; but it shows a more positive effect on a firm with a small board size than a firm with an average board size. Specifically, the environmental activities would increase firm market-based performance in a firm with a small or average board size; but it increases the firm performance greater in a small board size firm than a firm with an average board size. Interestingly, the environmental activities did not affect firm performance for a large board-size firm. The study also found that board size does not moderate the relationship between social activities and firm performance. Moreover, it was found that both the ESG combined activities and the individual pillar activities do not affect firm performance when moderated by board gender diversity.

5.2 Discussion

The significant findings and discussion of this study were given as follows.

5.2.1 The Positive Effect of ESG Disclosure Scores on Firm Performance

The study found that ESG disclosure scores, including ESG combined score, social pillar score, and Governance pillar score had no statistically significant effect on firm market-based performance; but only the Environmental pillar score showed a positive effect on firm market-based performance. These findings only support the hypothesis that the Environmental pillar score has a positive effect on firm market-based performance. Nonetheless, they do not support the proposed hypotheses of ESG disclosure scores, namely ESG combined score, social pillar score, and Governance pillar score, which have a positive effect on firm market-based performance. These findings support the stakeholder theory, which provides a valuable framework for understanding the underlying mechanisms and potential outcomes of ESG scores. The mechanism of these phenomena, ESG combined score, social pillar score, and Governance pillar score have no impact on firm performance, explaining that there is a relationship between the costs incurred and the

benefits derived from such efforts, that is, the costs of ESG combined activities, social activities, and governance activities are proportional to the additional benefits. Therefore, they compensate each other and do not affect firm performance. According to the environmental activities, the costs of environmental activities are less than the additional benefits. Therefore, the Environmental pillar score showed a positive effect on firm market-based performance. Moreover, it was incongruent with the studies of Wu and Li (2022), Fuadah et al. (2022), Quintiliani (2022), and Chen et al. (2023) who found that ESG performance positively impacts Tobin's Q. However, these findings support the previous studies of Dincă et al. (2022) who found inconclusive evidence on the influence of ESG disclosure scores on firm performance.

5.2.2 Moderating Roles of CEO Power on the Relationship between ESG Disclosure Scores and Firm Performance

The study results revealed that when a CEO serves as only managing director (non-CEO duality), engaging more in ESG activities enhances firm performance. Contrarily, when the CEO serves as both managing director and chairman (CEO duality), ESG activities do not affect firm performance. These findings support the agency theory, which suggests that CEO duality reduces a board's power to effectively oversee its management gap. Decision-making by those concurrently holding two positions can undermine the efficiency of management and the board's ability to conduct thorough evaluations (Fama & Jensen, 1983). Separating the roles of CEO and chairperson can help mitigate conflicts of interest and enhance corporate governance by improving oversight and accountability due to the board chair having more independence. The structure of non-CEO duality promotes a system of checks and balances, as the board chair is responsible for leading the board in its oversight function, while the CEO focuses on managing the company. Also, with different individuals in the role of CEO and board chair, there is likely to be a wide range of perspectives and expertise contributing to enhancing strategic decision-making. This separation can prevent the concentration of power in a single individual, which can lead to more balanced and thorough decision-making processes along with a decrease in potential conflicts of interest, improve the integrity of business operations and full disclosure of information, and enhance the board's ability to hold the CEO accountable. Moreover, a separate board chair can devote

more time and effort to leading the board and improving its effectiveness in governance activities such as monitoring management, setting strategic goals, and evaluating risks. Therefore, investors would view a non-CEO duality as a sign of strong governance practices that can enhance the firm reputation, leading to higher investor confidence, better access to capital, and an increase in firm market-based performance. Therefore, non-CEO duality is a hidden factor that influences ESG activities to increase firm market-based performance.

In contrast, for the phenomenon in a CEO duality firm where the CEO serves as both managing director and chairman of the board, the ESG combined activities and its pillar activities do not affect the firm market-based performance. It is explained by the agency theory that there may be less independent oversight of management, potentially leading to agency problems, costs due to conflicts of interest incurred, and higher company risk. Therefore, the benefits derived from ESG activities are proportional to the costs of such efforts. Thus, they compensate each other and do not affect firm performance.

5.2.3 Moderating Role of Institutional Ownership on the Relationship between ESG Disclosure Scores and Firm Performance

The study results revealed that institutional ownership moderates the effect of Environmental pillar scores and social pillar scores on firm market-based performance. In particular, environmental activities increase market-based performance in a firm with a low level and average level of institutional ownership. Social activities increase market-based performance in a firm with a low level of institutional ownership. The findings would explain that institutional investors are identified as important players in promoting ESG practices. Therefore, institutional ownership can moderate the relationship between ESG disclosures and market-based firm performance. However, companies with lower levels of institutional ownership need to do more ESG activities, especially environmental activities, and social activities. This will have a positive impact on their market value. This finding corresponds with the study of Busch, Bauer, and Orlitzky (2016).

5.2.4 Moderating Role of Board Size on the Relationship between ESG Disclosure Scores and Firm Performance

The study results revealed that board size moderates the effect of ESG combined, environmental, and governance pillar scores on firm market-based performance. For small board-size firms, the ESG combined environmental, and governance activities enhance firm performance. In addition, when a firm has an average board size, only the ecological activities could enhance a firm performance. These findings support the benefits of smaller boards in that smaller boards are more effective due to easier coordination, more streamlined communication, and less potential for conflict leading to faster decision-making. Moreover, this study used companies listed on the Thailand Sustainability Investment (THSI) index which are in an emerging market and most of these companies are smaller than those in developed markets. Therefore, the smaller boards may be more effective in overseeing and guiding ESG activities for the sampled companies. Hence, doing more ESG activities, especially environmental and governance, increases firm performance.

5.3 Contributions of the Study

5.3.1 Theoretical Contribution

In terms of theoretical contributions, the results demonstrate that stakeholder-agency theory can be used to explain the reason why ESG information is disclosed by Thai listed companies, although the disclosure is still voluntary reporting in Thailand. Based on the theory, it is conceptually defined as a tool to reduce information asymmetry and the extent of agency problems between top management and a wide range of stakeholders. The study closed or at least decreased the research gap by analysis of the relationship between ESG disclosure scores and firm performance, with interaction by institutional ownership, CEO duality, and board size.

This finding supports the stakeholder theory, which provides a valuable framework for understanding the underlying mechanisms and potential outcomes of ESG scores. The mechanism of this phenomenon, ESG scores have no impact on firm performance, explaining that there is a relationship between the costs incurred and the benefits derived from such efforts, that is, the costs of ESG activities are proportional to

the additional benefits. Therefore, they compensate each other and do not affect firm performance. The indication obtained from this study documents that stakeholder theory can be used to understand the mechanisms and possible outcomes of ESG disclosures. Furthermore, ESG factors are non- financial, and companies may not prioritize their disclosure due to the perception that such information is not material to financial performance or that it may be costly to disclose.

In addition, the result shows that board size and CEO duality moderate the relationship between ESG scores and firm performance. This finding supports the agency theory. This is because the board of directors acts as an intermediary between shareholders (principals) and management (agents). The number of boards can potentially provide more or less diverse expertise, perspectives, and oversight, which can help reduce agency costs by ensuring that management decisions are in the best interest of shareholders. Also, agency theory suggests that separating the roles of CEO and chairperson can help lessen conflicts of interest and enhance corporate governance. When the CEO also serves as the chairperson, there may be less independent oversight of management, potentially leading to agency problems. Therefore, more ESG activities do not enhance firm performance.

5.3.2 Practical implications

The practical implications of this finding are beneficial to several parties as follows.

(1) Regulator

For regulator such as the Securities and Exchange Commission (SEC) is responsible for setting criteria for listed companies to operate efficiently, transparently, and sustainably, which will have positive effects on the stock market and the country's economy. The study results can be applied to set guidelines and criteria, such as the voluntary ESG disclosures, the proportion of institutional ownership, non-CEO duality vs CEO duality structure, and the appropriate size of the board of directors of listed companies, to promote activities that are consistent with the ESG guidelines to enhance the company's performance and maintain it in the long run. Moreover, regulators should carefully consider implementing ESG practices in conjunction with other corporate governance mechanisms that are essential for company sustainability.

(2) Investors

For investors, while this study indicates that ESG factors may not be a significant indicator of firm performance, it is important to recognize that ESG activities can still help assess the long- term risks associated with investing in a company. Companies that fare poorly on ESG metrics could be vulnerable to regulatory, legal, and reputational risks, which can impact their financial performance. Furthermore, ESG factors can offer companies a competitive edge. For instance, environmentally sustainable companies may attract environmentally conscious consumers and investors. In addition, combining ESG approaches with other factors such as corporate governance mechanisms will help increase investor confidence, resulting in companies that are more efficient in firm market-based performance and achieving the goal of maximizing shareholder wealth. Therefore, investors should incorporate ESG disclosure scores, and other factors such as board size, proportion of institutional ownership, and non-CEO duality into their security analysis to assess a company's intrinsic value and make their investment decisions. Investors who take these factors into account are better equipped to identify companies that comply with current and future regulations, thus reducing the risk of facing regulatory penalties and fines.

(3) Management Team

Since ESG disclosure scores are becoming increasingly integrated into regulatory and legal frameworks worldwide, management teams should take these factors into account and are better equipped to identify companies that comply with current and future regulations and are increasingly acknowledging the significance of corporate reputation and brand value, thus reducing the risk of facing regulatory penalties and fines. Companies that exhibit a dedication to ESG principles are often viewed more favorably by customers, employees, and other stakeholders, which can boost their long- term competitiveness and value. Additionally, top management should consider implementing other corporate governance mechanisms alongside ESG activities.

The study results revealed that both environmental activities and social activities would enhance firm performance when a firm has a low level of institutional ownership; and for a firm with an average level of institutional ownership, only environmental activities can enhance firm performance. Therefore, the management of a company that

has low institutional shareholders should do more environmental activities or social activities that would enhance the firm market-based performance. Moreover, for a firm having institutional shareholders at an average level, doing more environmental activities could enhance firm performance.

The suggestions for business executives are that to enhance the firm market-based performance for a firm with small board size, the firm should do more ESG activities, especially environmental and governance activities. Additionally, increasing ecological activities can enhance the performance of a firm with an average board size.

5.4 Research Limitations and Suggestions for Future Research

5.4.1 Research Limitations

This study has some limitations that need to be addressed, which could be considered as cues for future research. Firstly, this study concentrates on only the Thai-listed companies. Secondly, even though this study investigates the moderating roles of board characteristics comprising board size, and board gender diversity; other aspects of board characteristics such as board independence, and other moderators should be considered. Lastly, this study only focuses on firm performance as measured by Tobin's Q ratio, while several proxies are measured for firm performance in previous studies, such as return on equity, stock price, and abnormal return. Additionally, several other corporate outcomes may be influenced by ESG scores and institutional ownership, CEO power, and board size, such as firm value, reputation, market reaction, and economic value added.

5.4.2 Suggestions for Future Research

According to the study, some future studies are suggested as follows.

(1) The qualitative research method should be used to confirm the study findings, which are based on quantitative research, and explain how companies can improve their ESG performance and influence the mechanisms that enhance firm performance.

(2) Future research should investigate ESG reporting of listed companies in the alternative capital market in Thailand using firm value and market reaction as the other corporate outcomes.

(3) Further studies should focus on other emerging markets including more countries and examine certain industries that may be affected by ESG policies and activities such as manufacturers and resource extractors.

(4) Other board characteristics, such as board independence, and other moderating factors, such as company characteristics, should be considered. It is also important to examine whether there is more than one moderator in the relationship between ESG practices and company performance.

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