UNIVERSITI TEKNOLOGI MARA

SUSTAINABILITY REPORTING AND FIRM VALUE WITH A MODERATING ROLE OF LEADERSHIP COMPETENCIES: EVIDENCE FROM MALAYSIA

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HOD BIN AMIN

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I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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ABSTRACT

Global economic challenges and sustainability concerns have intensified attention on corporate practices. In Malaysia, sustainability reporting has expanded significantly, yet there is limited academic research on its relationship with firm value, particularly among public listed companies. Few research has examined the role of leadership competencies as a moderating factor in this relationship, although such competencies are essential in guiding sustainability reporting strategies. This research investigates the relationship between sustainability reporting and firm value in Malaysian public listed companies with emphasis on the moderating role of leadership competencies. Secondary data were collected from 252 companies on Bursa Malaysia between 2018 and 2022. Sustainability reporting is measured using Global Reporting Initiative (GRI) indicators and combined with financial metrics to assess firm value. The research examines whether leadership competencies such as tenure, gender, educational background, and governance knowledge strengthen or weaken the relationship between sustainability reporting and firm value. The analysis covers economic sustainability reporting, environmental sustainability reporting, and social sustainability reporting to provide a comprehensive assessment. The findings contribute theoretically by addressing the limited research on leadership competencies as a moderating variable, thereby enriching the literature on sustainability reporting and firm value in emerging markets. From a practical perspective, the research demonstrates how leadership competencies can improve sustainability reporting practices, reduce financial and reputation risks, and build stronger investor confidence. Importantly, the research underscores the strategic role of sustainability reporting in Malaysian public listed companies and provides guidance for policymakers and firm leaders to strengthen sustainability reporting transparency and reinforce Malaysia's competitiveness in the global economy.

Keywords: sustainability reporting, firm value, leadership competencies, economic sustainability reporting, environmental sustainability reporting, social sustainability reporting, Malaysian public listed companies

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CHAPTER 1
INTRODUCTION

1.1 Overview of the Chapter

This chapter introduces the study on sustainability reporting and firm value within the Malaysian corporate environment. Sustainability reporting has become increasingly important as organisations respond to global expectations for transparency, responsible governance, and long-term resilience. International frameworks such as the United Nations Sustainable Development Goals and the Global Reporting Initiative continue to strengthen the global focus on sustainability performance, with recent revisions emphasising materiality, climate disclosures, and stakeholder impacts (GRI, 2023). The regulatory landscape in Malaysia has also evolved, particularly with the updated Bursa Malaysia Sustainability Reporting Guide, which strengthens reporting expectations for public listed companies and aligns Malaysian practices with international standards (Bursa, 2023).

The chapter also highlights how leadership competencies influence the level of sustainability reporting. Leaders determine whether sustainability is integrated into strategic planning, organisational culture, and long-term value creation. Competent leadership enhances the credibility and depth of sustainability reporting by ensuring that reporting reflects genuine performance rather than mere compliance tendencies. This study therefore examines the connection between leadership competencies and firm value in the context of sustainability reporting. The research questions focus on determining the extent to which sustainability reporting influences firm value and assessing how leadership competencies moderate this relationship. The chapter reflects the Malaysian context, where regulatory advancements, climate sensitivity, and diverse leadership structures make this investigation timely and relevant.

1.2 Background of the Thesis

Sustainability reporting has become a central component of modern corporate governance. Firms across the world are increasingly expected to report economic, environmental, and social performance in a structured manner. This trend is supported

by heightened stakeholder expectations, investor scrutiny, and regulatory shifts that emphasise transparency and long-term responsibility. Global developments in climate science and sustainability frameworks have added urgency to this practice. For example, the Sixth Assessment Report by the Intergovernmental Panel on Climate Change confirms that climate-related disruptions, including rising temperatures, unpredictable rainfall, and intensifying coastal erosion, continue to affect economic stability in many countries, including Malaysia (IPCC, 2022). Such developments create operational and financial challenges that firms must address through clear and credible sustainability reporting.

International reporting frameworks such as the revised Global Reporting Initiative Standards, the Corporate Sustainability Reporting Directive, and the International Sustainability Standards Board are reshaping global expectations for sustainability reporting (IFRS, 2023). These frameworks place strong emphasis on long-term value creation, climate risk management, and responsible business conduct. Malaysia has followed these developments closely. Reports by KPMG (2023) indicate that more than 98% of Malaysian public listed firms now produce sustainability reports, reflecting strong national adoption. However, PwC Malaysia's 2024 review shows that only 38% of these reports undergo independent assurance, highlighting a persistent gap between compliance and credibility.

Although sustainability reporting is widely practised, its impact on firm value remains inconclusive. Some studies find that transparent reporting enhances investor confidence, improves market performance, and reduces information asymmetry (Vo Van et al., 2025). Other research suggests that the effect varies depending on the regulatory context, industry, and managerial commitment (Nguyen, 2023). These inconsistent findings reveal a significant research gap. The need to understand whether sustainability reporting enhances firm value in Malaysia and to identify organisational factors that influence this relationship forms the foundation of this study.

Internal drivers of sustainability performance are also critical. After considering external pressures such as climate vulnerability and regulatory requirements, it becomes clear that leadership competencies play a central role in determining the level of sustainability reporting. Leaders shape organisational values, allocate resources, and determine the level of transparency in reporting. Studies indicate that leadership experience, educational background, industry knowledge, and strategic orientation influence the depth and level of sustainability reporting (Liaqat et al., 2024). In contrast,

firms led by individuals lacking sustainability awareness may produce reports that are symbolic and lack strategic relevance. In Malaysia, variations in leadership competencies and sustainability practices have been documented, suggesting uneven integration of sustainability across organisations (Salleh, 2020).

Malaysia offers a meaningful context for this research. The country's regulatory environment has evolved rapidly, with increasing emphasis on sustainability practices following Bursa Malaysia's mandatory reporting requirements and the national commitment to the Sustainable Development Goals (Bursa, 2022). At the same time, climate-related vulnerabilities remain significant in sectors such as palm oil, aquaculture, transportation, and tourism, which continue to face physical and transition risks caused by rising temperatures, flooding, and extreme weather events (Bank ,2022). These conditions increase the need for credible sustainability reporting. The leadership composition within Malaysian firms also varies considerably, and prior studies suggest that leadership experience, diversity, and competencies influence reporting practices and long-term value creation (ACCA, 2022). Taken together, these elements justify exploring how sustainability reporting interacts with leadership competencies to influence firm value in Malaysia.

1.3 Statement of the Problem

The accelerating effects of global warming have intensified global attention on how firms manage climate-related and sustainability risks. The Intergovernmental Panel on Climate Change (IPCC) reports that global temperatures have already increased by approximately 1.1 °C above pre-industrial levels, contributing to more extreme weather events, rising sea levels, supply chain disruptions, and reduced economic stability (IPCC, 2023). These climate-related pressures increase financial risks for businesses, influence investor expectations, and heighten the need for firms to communicate how they manage sustainability challenges. As a result, sustainability reporting has emerged as a key mechanism through which firms report their economic, environmental, and social performance and demonstrate their resilience in a climate-affected global economy. Stakeholders rely on such reporting to assess long-term value creation, governance quality, and firms' capacity to withstand environmental and economic disruptions.

Although sustainability reporting is widely recognised as a tool for improving transparency and supporting value creation, uncertainty remains regarding the extent to which such reporting contributes to firm value. Global empirical findings are mixed. Some studies indicate that sustainability reporting enhances firm value by increasing investor confidence and strengthening market reputation. Other studies find weak or inconsistent relationships when reporting quality is low or when sustainability reporting lacks measurable climate-related performance indicators. These conflicting results suggest that the impact of sustainability reporting on firm value is not automatic and may depend on contextual factors such as reporting credibility, leadership competencies, and market expectations.

In Malaysia, sustainability reporting has expanded significantly following regulatory reforms such as the Bursa Malaysia Sustainability Reporting Guide, alongside increasing expectations for transparency in environmental, social and governance practices (PwC, 2024). Recent surveys indicate that almost all major Malaysian public-listed companies now publish sustainability reports, reflecting widespread regulatory compliance and institutional adoption (KPMG, 2024). However, the presence of sustainability reports does not necessarily indicate a high level of sustainability reporting that is decision useful for investors. Many sustainability reports in Malaysia remain largely descriptive, provide limited quantifiable performance indicators, and are not consistently supported by independent assurance. For example, only 38% of the top 100 listed companies on Bursa Malaysia subjected their sustainability reports to independent external assurance in 2024 (PwC Malaysia, 2024). As a result, investors may encounter difficulties in evaluating whether sustainability-related activities are meaningfully linked to firm value creation.

Although sustainability reporting is mandatory under Bursa Malaysia's Listing Requirements, the extent to which firms demonstrate a high level of sustainability reporting remains inconsistent across firms (Bursa, 2022). Many reports emphasise broad commitments and general narratives rather than clearly explaining how sustainability practices are embedded in corporate strategy or contribute to long-term organisational performance (KPMG, 2022). This disconnects between widespread adoption and variation in the level of sustainability reporting raises concerns about the usefulness of sustainability reporting for capital market participants in Malaysia (PwC, 2023).

The uncertainty surrounding the relationship between sustainability reporting and firm value is further complicated by leadership characteristics at the CEO and board levels. Top management and boards of directors play a central role in determining whether sustainability reporting is approached as a strategic, value enhancing activity or treated primarily as a regulatory compliance exercise. Observable leadership traits such as CEO gender, board gender diversity, educational qualification, educational specialisation, age, nationality, professional working experience, years of service as CEO, and tenure in the current position may influence strategic orientation, governance effectiveness, and the level of sustainability reporting achieved by firms.

Variation in these leadership competencies may lead to substantial differences in the level of sustainability reporting. CEOs with higher academic qualifications, business related educational backgrounds, longer managerial experience, and extended tenure may possess greater capability to integrate sustainability considerations into corporate strategy and reporting practices. Similarly, greater female representation on boards and gender diversity in leadership may contribute to stronger governance structures and a higher level of sustainability reporting. In contrast, limited experience, shorter tenure, or weaker alignment between educational background and managerial responsibilities may result in sustainability reporting that is symbolic and compliance oriented, thereby reducing its relevance for firm valuation.

Evidence suggests that leadership structures among Malaysian public listed companies vary considerably, reflecting differences in CEO demographics, professional backgrounds, and board composition. Despite increasing recognition of leadership's role in shaping sustainability practices, empirical studies in Malaysia have rarely examined how specific, measurable CEO and board characteristics moderate the relationship between sustainability reporting and firm value (Salleh, 2020; Ameer, 2022). Most prior research focuses on the direct effects of sustainability reporting while overlooking the moderating influence of leadership competencies on achieving a high level of sustainability reporting that is value relevant.

Moreover, while sustainability reporting research has expanded globally, limited Malaysian studies integrate sustainability reporting, firm value, and leadership competencies within a unified analytical framework. Given evolving regulatory expectations and substantial variation in leadership competencies across firms, the value relevance of sustainability reporting in Malaysia may differ from that observed in developed economies. Accordingly, there is a clear need to empirically investigate

whether sustainability reporting enhances firm value in Malaysia and to assess whether CEO and board leadership competencies moderate this relationship.

Despite the global expansion of sustainability reporting research, few studies in Malaysia explicitly link climate-related risks, firm value, and leadership competencies within a unified framework. In addition, evolving regulatory requirements and wide variations in leadership structures across firms suggest that the value relevance of sustainability reporting in Malaysia may differ from that observed in developed economies. Therefore, there is a clear need to investigate whether sustainability reporting enhances firm value in Malaysia and to assess whether leadership competencies moderate this relationship.

In summary, the central problem addressed in this study is that although sustainability reporting adoption in Malaysia is high, its impact on firm value remains unclear due to inconsistent reporting quality, limited independent assurance, and substantial variation in leadership competencies. These unresolved issues highlight the need for empirical research that examines the influence of sustainability reporting on firm value and the moderating role of leadership competencies in Malaysian publicly listed companies.

Global warming and climate related risks have intensified the demand for higher level sustainability reporting, yet the ability of such reporting to influence firm value remains inconsistent. International studies suggest that sustainability reporting can improve firm value through increased transparency and improved climate risk communication, but findings vary across contexts. Emerging economies such as Malaysia face unique regulatory pressures, institutional limitations, and climate vulnerabilities that may affect the value relevance of sustainability reporting. This variation indicates that international evidence cannot be generalised to Malaysia without further investigation.

Global warming and climate related risks have increased the demand for more comprehensive sustainability reporting, yet the extent to which such reporting enhances firm value remains inconsistent across empirical studies. International research shows that sustainability reporting may improve firm value through greater transparency, reduced information asymmetry, and clearer communication of climate related risks (Clarkson et al., 2020). However, the strength and direction of these effects differ across countries due to variations in regulatory requirements, market maturity, and investor expectations. In emerging economies such as Malaysia, unique institutional constraints,

evolving regulatory frameworks, and heightened exposure to climate vulnerabilities complicate the value relevance of sustainability reporting (Bank, Climate risk profile: Malaysia, 2023).These contextual differences suggest that findings from international settings cannot be directly generalised to Malaysia and highlight the need for further empirical investigation.

A gap concerns the limited integration of leadership competencies into models that examine sustainability reporting and firm value. Leadership is a critical determinant of reporting quality, as leaders shape organisational priorities, risk management practices, and the credibility of reported information. However, most Malaysian studies overlook specific leadership competencies at the CEO and board levels, such as professional working experience, academic qualifications, educational specialisation, tenure, age, gender, board gender diversity, and nationality. Prior research indicates that observable leadership attributes play a critical role in shaping the extent to which firms achieve a high level of sustainability reporting, as well as the credibility and strategic integration of sustainability practices within corporate reporting. (Pless, 2021). Studies that assess sustainability reporting without incorporating measurable leadership characteristics risk omitting an important determinant of reporting outcomes and investor perception, particularly in contexts where CEO and board leadership profiles strongly influence sustainability reporting practices (ACCA, 2021). Therefore, two main research gaps are addressed in this study. First, the effect of sustainability reporting on firm value in Malaysia remains unclear due to inconsistent level of sustainability reporting. Second, the role of leadership competencies as a moderating variable has not been empirically tested, despite its recognised importance in shaping the credibility and strategic value of sustainability reporting. This study addresses these gaps by examining the relationship between level of sustainability reporting and firm value and by assessing whether leadership competencies moderate this relationship in the Malaysian publicly listed sector.

1.4 Research Objectives

Sustainability reporting has emerged as a strategic tool in corporate governance, especially in climate vulnerable economies such as Malaysia. With global regulatory frameworks and local mandates shaping reporting practices, Malaysian public listed companies are under increasing pressure to report their environmental, economic, and

social practices transparently. However, the extent to which sustainability reporting influences firm value remains unclear. Existing research presents mixed findings, and many studies lack contextual relevance for Malaysia's regulatory, economic, and leadership environment (PwC, 2024). Furthermore, while leadership competencies have been identified as crucial in advancing sustainability strategies, their role in moderating the impact of sustainability reporting on firm value is insufficiently addressed in local studies (Salleh, 2020; Liaqat et al., 2024). This study therefore addresses this gap by empirically investigating how sustainability reporting affects firm value in Malaysia and whether leadership competencies have a moderating effect on this relationship. The objectives of this research are aligned with Malaysia's current reporting landscape, climate vulnerabilities, and leadership diversity challenges, particularly in the post pandemic context, which has highlighted the strategic importance of sustainability for resilience (Ali et al., 2023).

The specific research objectives are as follows:

1. To identify the level of sustainability reporting of Malaysian public-listed companies.
2. To examine the relationship between sustainability reporting and the firm value of Malaysian public-listed companies.
3. To examine whether economic, environmental, and social sustainability reporting have a significant relationship with the firm value of Malaysian public-listed companies.
4. To examine whether leadership competencies have a moderating effect on the relationship between sustainability reporting and the firm value of Malaysian public-listed companies.

1.5 Scope of the Research

This research focuses on public listed companies on Bursa Malaysia's Main Market, as these entities are required to comply with the mandatory sustainability reporting guidelines issued by Bursa Malaysia since 2015. The Main Market represents larger and more established firms that have well-structured governance and reporting mechanisms, making them suitable for assessing the relationship between sustainability reporting and firm value (KPMG, 2023). The study excludes firms listed on the ACE and LEAP Markets because these companies generally consist of smaller and newly

established entities that have limited resources and operate under less stringent sustainability reporting requirements. Financial institutions are also excluded because they follow sector specific reporting frameworks under Bank Negara Malaysia and other regulatory bodies, which differ substantially from those applied to non-financial firms (PwC, 2024).

The five-year period from 2018 to 2022 was selected to capture developments following the enhanced sustainability reporting requirements under the Bursa Malaysia Listing Requirements, particularly the 2018 revision of the Sustainability Reporting Guide and the subsequent 2022 update, as well as the impact of external shocks such as the COVID 19 pandemic. This timeframe coincides with Malaysia's strengthening sustainability reporting policies and global calls for more transparent corporate accountability. During these years, firms faced growing stakeholder pressure to demonstrate resilience and long-term value creation, especially following the economic and environmental disruptions caused by the pandemic (Ali et al., 2023). The chosen duration also allows for trend analysis, offering a balanced view of pre pandemic, pandemic, and recovery phases within Malaysia's corporate environment.

The research adopts a quantitative document analysis approach focusing on secondary data obtained from annual and standalone sustainability reports of firms listed on Bursa Malaysia's Main Market. The use of archival data ensures consistency, objectivity, and comparability across reporting periods, allowing for an in-depth assessment of reporting quality and its impact on firm value. This study does not incorporate survey or interview data, as its emphasis lies in evaluating objectively verifiable information reported by firms in compliance with regulatory requirements.

Geographically, this study is confined to Malaysia, an emerging economy that has strengthened its sustainability reporting framework through Bursa Malaysia's regulatory enhancements and alignment with global standards such as the Sustainable Development Goals and the Task Force on Climate related Financial Disclosures recommendations (Resources, 2023). The findings are therefore context-specific and may not be directly generalizable to other countries with different regulatory or institutional environments. However, Malaysia's experience provides valuable insights for other emerging economies with similar market structures and governance challenges.

The study's conceptual scope centres on three main constructs: sustainability reporting, firm value, and leadership competencies. Sustainability reporting is examined

through three dimension that is economic, environmental, and social, while firm value is measured by market capitalisation data published by Bursa Malaysia. Leadership competencies serve as the moderating variable, emphasizing how leadership characteristics influence the strength and direction of the relationship between sustainability reporting and firm value. Other potential moderators such as board ownership, corporate culture, or external assurance are acknowledged but remain beyond the boundaries of this research.

Although this study focuses on listed firms, its findings provide broader implications for regulators, investors, and policymakers, offering empirical evidence on how leadership competencies can enhance the credibility and effectiveness of sustainability reporting. The study contributes to ongoing national and global efforts to improve the transparency and accountability of corporate reporting, particularly in economies that are both rapidly developing and climate vulnerable. Despite its limitations, this research adds meaningful insight into how sustainability reporting, leadership competencies, and firm value interact within Malaysia's dynamic business landscape.

1.6 Significance of the Research

This research provides important contributions in theoretical, practical, and policy dimensions by exploring the relationship between sustainability reporting, leadership competencies, and firm value within the Malaysian context. The study responds to increasing regulatory emphasis and societal expectations for corporate transparency, particularly following Malaysia's implementation of mandatory sustainability reporting requirements under Bursa Malaysia. It adds to the growing academic interest in how firms balance profitability with accountability and long term value creation.

From a theoretical perspective, this research contributes to the literature by strengthening the understanding of how sustainability reporting influences firm value through the moderating role of leadership competencies. It extends existing corporate reporting theories by integrating leadership competencies as a key behavioural and governance factor that enhances or constrains the strategic value of sustainability reporting. Prior research has largely focused on direct associations between sustainability reporting and firm value, but this study introduces leadership

competencies as a vital moderating element that explains variations in firm outcomes (Liaqat et al., 2024). By focusing on leadership characteristics such as education, experience, and diversity, the study deepens theoretical understanding of how human capital and governance dynamics interact with sustainability reporting frameworks. This integrated perspective provides a foundation for refining reporting and leadership theories within emerging markets.

n the practical context, this study offers insights for corporate leaders and practitioners seeking to strengthen their sustainability reporting strategies. Findings from this research help firms understand that sustainability reporting is not merely a compliance exercise but a strategic instrument that can enhance firm value when supported by competent leadership. The research highlights the importance of developing leadership competencies that drive long term strategic thinking, innovation, and accountability in corporate reporting. Companies can use these findings to design targeted leadership development programs, improve board diversity, and strengthen oversight mechanisms to ensure sustainability information reflects genuine performance rather than symbolic reporting. During the COVID 19 pandemic, many Malaysian companies that had integrated sustainability leadership practices were better equipped to maintain stability and investor trust (Ali, 2023). Thus, this research underscores how leadership and reporting alignment improves corporate resilience in uncertain economic and environmental conditions.

From a policy standpoint, the study provides empirical evidence that can guide regulators and policymakers in improving sustainability reporting frameworks. The findings will help regulatory bodies such as Bursa Malaysia and the Securities Commission refine reporting requirements to encourage substance over form, ensuring that sustainability reports communicate meaningful information about firm value creation. Policymakers can also draw on these insights to promote leadership competencies standards as part of governance regulations, aligning corporate leadership expectations with sustainability objectives (PwC, 2024). Such alignment can enhance Malaysia's reputation as a regional leader in sustainable business practices, supporting national goals under the Twelfth Malaysia Plan, which emphasizes sustainable and inclusive growth.

Beyond its academic and policy contributions, the research has societal relevance by promoting corporate accountability and environmental stewardship in Malaysia. As Malaysia continues to experience climate related challenges such as

declining palm oil yields, flooding, and resource depletion, effective sustainability reporting supported by competent leadership is crucial for economic stability and social wellbeing (Malaysia, 2024).The study's results may guide firms in adopting more resilient and responsible business models that contribute to national and global sustainability agendas.

In conclusion, this research is significant because it bridges theoretical gaps, provides actionable guidance for firms, and supports policymaking aimed at advancing sustainable economic transformation in Malaysia. By clarifying how leadership competencies enhance the impact of sustainability reporting on firm value, the study delivers both academic and practical contributions that benefit corporate leaders, regulators, investors, and society at large.

1.7 Conclusion of the Chapter

This chapter has presented a comprehensive introduction to the study on sustainability reporting and firm value, emphasising the moderating role of leadership competencies in the Malaysian corporate context. It has laid the groundwork for the research by linking global, regional, and national perspectives on sustainability practices while clarifying their relevance to Malaysia's corporate environment. The discussion has also demonstrated that sustainability reporting is now regarded as a strategic instrument for transparency, accountability, and long-term value creation rather than a simple regulatory requirement (Ali, 2023).

Global warming has emerged as one of the most critical external factors influencing corporate strategies and reporting practices. Rising global temperatures, frequent climate related disruptions, and extreme weather events have increased the importance of sustainability reporting as firms seek to demonstrate how they manage environmental and social risks. These climate driven challenges directly affect firm value, as investors, consumers, and regulators demand greater accountability and adaptability to climate related risks (Bank, 2023). In Malaysia, industries such as palm oil, tourism, and manufacturing are especially sensitive to changing weather patterns, highlighting the importance of effective sustainability reporting for preserving firm competitiveness and market value (Malaysia., 2024)

The chapter reaffirmed that sustainability reporting has become a vital part of corporate practice in Malaysia, supported by Bursa Malaysia's mandatory reporting

guidelines. The focus remains specifically on sustainability reporting and its relationship with firm value. Sustainability reporting has also gained importance due to global warming effects, which influence firm value and investor decisions. Companies that integrate sustainability strategies into their operations are better positioned to enhance resilience, attract investment, and protect long term firm value(PwC, 2024).

The chapter identified important theoretical and empirical gaps in previous research. Although sustainability reporting has been linked to improved firm value, findings remain mixed across contexts due to differences in regulation, measurement, and leadership. This study introduces leadership competencies as a moderating factor, acknowledging that competent leadership is crucial for transforming sustainability reporting into a strategic asset that supports firm value. Leaders with strong competencies are more competent of aligning sustainability objectives with business goals, ensuring that sustainability initiatives are meaningful and impactful (Liaqat et al., 2024; Salleh, 2020). Leadership competencies such as education, experience, and diversity influence both the effectiveness and credibility of sustainability reporting, helping firms build stakeholder trust and enhance market confidence.

The research problem was clearly articulated, highlighting that despite Malaysia's progress in mandatory sustainability reporting, the effect on firm value remains uncertain. The research objectives and questions were formulated to address this gap by assessing the level of sustainability reporting among Malaysian public listed companies, exploring its relationship with firm value, and determining whether leadership competencies influence this association. The study's five year scope from 2018 to 2022 captures a crucial period that includes post regulatory developments and the COVID 19 pandemic, both of which have shaped reporting practices and leadership responses to sustainability challenges (Ali et al., 2023).

The significance of this research lies in its theoretical, practical, and policy contributions. Theoretically, it extends understanding by examining how leadership competencies moderate the sustainability reporting–firm value relationship. Practically, it offers guidance to corporate leaders on how effective leadership can enhance the value relevance of sustainability reporting. From a policy perspective, this study provides insights for regulators such as Bursa Malaysia and the Securities Commission to strengthen sustainability reporting standards and leadership development frameworks (KPMG, 2023).

In summary, this chapter established the foundation for exploring how sustainability reporting, firm value, and leadership competencies interact within Malaysia's emerging economy. It also emphasizes that global warming has intensified the importance of credible sustainability reporting and leadership competencies, both of which are vital for maintaining firm value in the face of environmental and economic uncertainty. The next chapters will build on this foundation by reviewing relevant literature, developing the conceptual framework, outlining the methodology, and presenting empirical findings that contribute to advancing sustainable corporate practices in Malaysia.

CHAPTER 2
LITERATURE REVIEW

2.1 Overview of the Chapter

This chapter provides a comprehensive review of the literature relevant to this research. It begins with an exploration of the theoretical background of sustainability reporting, outlining key theories that support sustainability practices and leadership within organisations. Following this, the chapter discusses the significance of firm value and how it is influenced by sustainability reporting and leadership competencies.

This chapter also examines the main factors of the research, including firm value and sustainability reporting and its economic, environmental, and social dimensions. The role of leadership competencies within organisations is also examined, particularly in relation to sustainability practices and decision making.

Lastly, the chapter outlines the structure of the literature review to ensure a logical flow of discussion that builds on existing knowledge while identifying gaps that this research aims to address.

2.2 Sustainability Reporting

2.2.1 Brief History of Sustainability Reporting and Sustainability Reporting Practice

Sustainability reporting, also referred to as corporate social responsibility reporting or non-financial reporting, is the practice of publicly reporting an organisation's economic, environmental, and social performance (Adams, 2015). A significant milestone in the evolution of sustainability reporting was the establishment of the Global Reporting Initiative in 1997. The Global Reporting Initiative framework provides standardised guidelines for organisations to report their sustainability performance, ensuring consistency and comparability across industries. It emphasises the principles of openness, accountability, and stakeholder engagement in reporting (GRI, 2018). Over time, GRI has played a crucial role in promoting sustainability reporting and enhancing the understanding of corporate value creation beyond financial metrics (GRI, 2017).

By the 2000s, sustainability reporting had become a mainstream practice globally. Various stakeholders, including investors, customers, employees, and regulators, have increasingly recognised the importance of transparency in corporate sustainability performance (GRI, 2021).

2.2.2 The Evolution of Sustainability Reporting in Malaysia

Malaysia has actively engaged in sustainability reporting initiatives, aligning with international sustainability efforts. The country participated in the United Nations Commission on Sustainable Development in 2004, 2005, and 2007 (Joseph, Malaysia's commitment to the United Nations Sustainable Development Goal, 2021). The transition towards mandatory sustainability reporting has been shaped by multiple regulatory developments and institutional frameworks.

Before sustainability reporting became mandatory, Malaysia initially adopted a voluntary approach to sustainability reporting among publicly listed companies. Subsequent empirical reviews indicate that early reporting practices were characterised by low awareness, inconsistent reporting quality, and limited integration of sustainability considerations into corporate decision making, largely due to the absence of binding regulatory requirements and standardised reporting frameworks (Loh, Institutional drivers of sustainability reporting in ASEAN, 2021)

In response, Bursa Malaysia progressively strengthened its sustainability reporting framework, transitioning from voluntary guidance to mandatory sustainability reporting statements in annual reports. This regulatory shift was formalised through the Bursa Malaysia Sustainability Reporting Guide (2018) and later enhanced to improve the clarity, comparability, and reliability of sustainability reporting among listed companies (Bursa, 2023).

Despite this, sustainability reporting among Malaysian firms remained limited in scope. Ioannou (Ioannou, 2016) found that voluntary reporting was practised to some extent, but many companies were reluctant to report comprehensive sustainability information. (Haji, 2013) noted that this reluctance stemmed from the absence of detailed reporting guidelines before 2006. In response, Bursa Malaysia launched the Business Sustainability Program in 2010 to enhance sustainability awareness and reporting practices among Malaysian firms.

A major global shift in sustainability efforts occurred in 2015 with the launch of the United Nations' 2030 Agenda for Sustainable Development, which introduced 17 Sustainable Development Goals (SDGs) (Hoch, 2016). Malaysia, alongside 192 world leaders, committed to these goals, encompassing five key dimensions: people, planet, prosperity, peace, and partnership. In alignment with this agenda, Bursa Malaysia introduced the Sustainability Reporting Framework in 2015, making sustainability reporting mandatory in annual reports (Carrot, 2016). This framework was designed to strengthen corporate sustainability commitments and progressively moved firms towards standalone sustainability reporting, rather than embedding sustainability information within the chairman's statement, as later formalised and clarified in subsequent regulatory enhancements by Bursa Malaysia (Bursa, 2023).

Figure 2.1 illustrates the key milestones in the evolution of sustainability reporting by Bursa Malaysia. In 2006, Bursa Malaysia introduced voluntary sustainability reporting guidelines to encourage transparency among listed companies. This was followed by a mandatory reporting requirement in 2007, marking a significant shift towards corporate accountability in sustainability practices. In 2010, Bursa Malaysia launched the Business Sustainability Program to further promote awareness and engagement in sustainable practices. The Sustainability Reporting Framework was introduced in 2015, making sustainability reporting a mandatory requirement in annual reports. In 2017, Practice Note 9 was introduced to clarify reporting requirements and ensure consistency across corporate reporting. Finally, in 2018, the Malaysian Sustainability Reporting Guidelines were updated, incorporating a more structured approach to sustainability reporting by emphasising economic, environmental, and social dimensions. This timeline reflects Bursa Malaysia's progressive efforts to institutionalise sustainability reporting and align corporate practices with global sustainability goals.

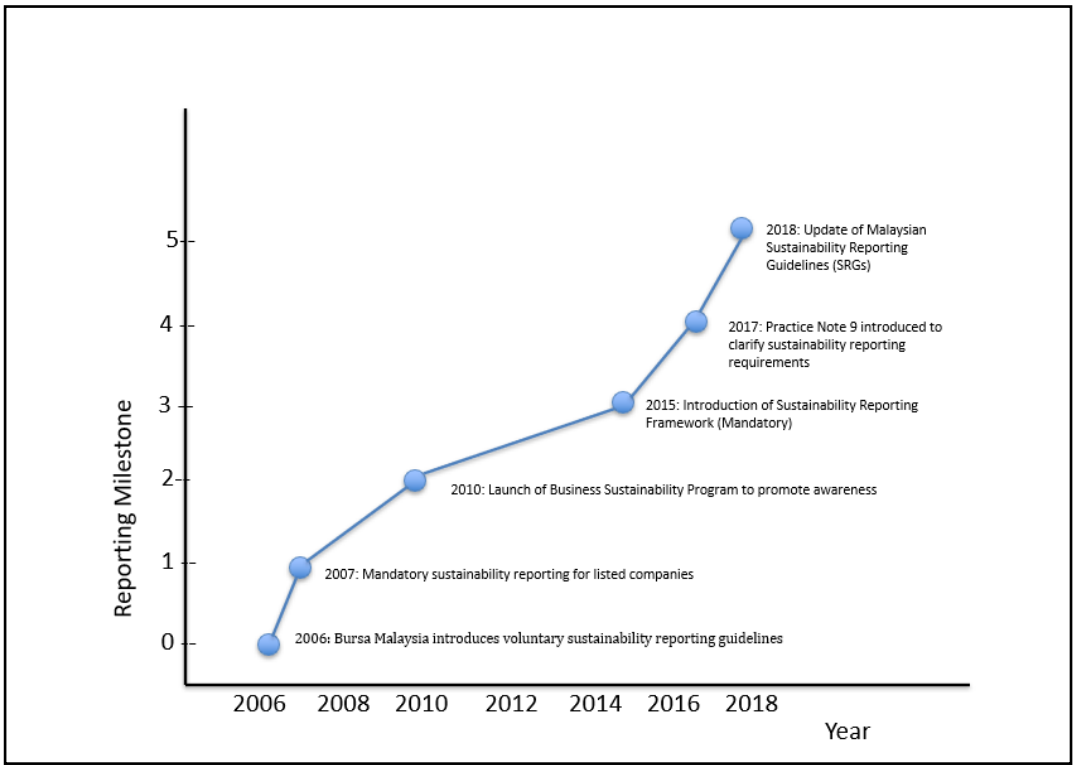

Figure 2.1 Sustainability Reporting Timelines by Bursa Malaysia

2.3 Theoretical Underpinnings

Sustainability is not a new concept in management theory, as it is a globalised concept that has been proposed and discussed by scholars and economists for decades (Lonkani, 2018). This research presents the theoretical perspectives through three lenses, namely sustainability practice, firm value, and leadership perspectives. These theories provide an understanding of the underlying concepts by explaining the role of sustainability reporting and leadership competencies in enhancing firm value and business performance.

2.3.1 Stakeholder Theory

Scholars and practitioners widely use stakeholder theory as a common theoretical framework to explain sustainability reporting (Kee, 2019). This theory, which was first described in the early twentieth century, posits that a firm can maintain strong relationships with its stakeholders by accomplishing intended objectives. Such established relationships can contribute to the development of a firm's good reputation and positively influence firm value (Bose, 2017)

Although they are often used interchangeably, the terms stakeholder and shareholder represent two distinct concepts. As stated by Lonkani (2018), shareholder theory and stakeholder theory are opposing perspectives, each presenting a different view of property rights. Shareholder theory holds that shareholders are the sole owners of a firm's assets because they provide the invested capital. In contrast, stakeholder theory supports the view that all stakeholders possess certain rights related to the organisation's assets (Lonkani, 2018).

Stakeholder theory also states that a firm has a responsibility toward its other stakeholders, which include customers, suppliers, government, employees, and public society (Ferrell, 2010). A broad range of stakeholder's regard sustainability reporting by firms as a significant issue. According to McElroy (2012), stakeholders play a crucial role in ensuring that firms manage, measure, and report their sustainability strategies. Thus, a firm is not based solely on profit maximisation, but also on the maximisation of sustainability value (Martirosyan, 2013).

This research uses stakeholder theory to explain the motivation of managers and organisations for sustainability reporting. Organisational responsibility to stakeholders provides the basis for applying stakeholder theory. This theory explains that the existence of an organisation is strongly shaped by the support of groups and individuals connected to it (Freeman, Stakeholder Theory : The State of the Art, 2010). Groups and individuals, referred to as stakeholders, possess the capacity to impact the process of achieving an organization's goals.

Stakeholders increasingly rely on sustainability reporting to evaluate a firm's role in addressing social and environmental challenges. Through clear and consistent sustainability reporting, firms enhance corporate accountability and transparency, enabling stakeholders to assess organisational responsibilities beyond financial performance. Contemporary stakeholder-based studies emphasise that sustainability reporting represents a firm's responsibility not only to investors and owners, but also to a broader group of stakeholders affected by corporate activities (Freeman, 2020)

2.3.2 Stewardship Theory

Stewardship theory provides a valuable framework for explaining firm value by emphasising intrinsic motivation, trust, and goal alignment between managers and organisations. Contemporary studies suggest that managers acting as stewards are

motivated to maximise organisational performance and long-term value rather than pursue personal (Madison, 2016).From a sustainability perspective, stewardship theory views management as responsible for the effective governance of organisational capitals and resources, including financial, human, manufactured, environmental, and social dimensions, thereby supporting integrated value creation (Rezaee, 2018)

By recognising potential tensions among different sustainability performance dimensions, stewardship theory explains how managers balance competing objectives to create shared value over time (Rezaee, 2018). As it offers a relational and trust based view of managerial behaviour, stewardship theory is widely regarded as a strong alternative to agency theory, which has been criticised for its narrow assumptions regarding motivation and control in modern business organisations (Chrisman, 2019).

Stewardship theory offers valuable insights into the relationship between sustainability reporting and firm value, particularly when considering the moderating role of leadership competencies. Stewardship theory views managers as stewards who prioritize the organization's interests over their own. This perspective suggests that leaders with a strong stewardship orientation are more likely to engage in responsible and sustainable practices, including accurate and transparent sustainability reporting. In the context of Malaysia, leadership capability can play a moderating role by shaping the degree to which managers embrace stewardship behaviour and engage in sustainable reporting practices. Recent research by Garcia, (2023) highlights the role of sustainable development leadership in shaping firm value. Their empirical study, conducted across European firms listed in the Dow Jones Sustainability Index, reveals that while sustainability leadership is often perceived as a strategic advantage, its value relevance is influenced by corporate governance structures and market sentiment. The study also notes a decline in stock market enthusiasm for sustainability leadership over time, suggesting that as sustainability practices become mainstream, their competitive edge diminishes. This finding highlights the importance of aligning leadership competencies with sustainable reporting to enhance long-term firm valuation (Garcia, 2023). To fully understand the implications of sustainability reporting on firm value, this research should integrate stewardship theory and assess how leadership competencies balance these effects.

2.3.3 Triple Bottom Line

Historically, businesses operated in service solely to their financial bottom line. In 1994, author and entrepreneur John Elkington introduced the concept of the triple bottom line with the aim of transforming a financial accounting focused business system into a more comprehensive approach that measures impact and success beyond profit alone (Wisconsin, 2022). The triple bottom line is a sustainability framework that evaluates a company's performance based on three dimensions, namely profit, people, and planet. This framework broadens traditional financial metrics to include an organisation's social and environmental impacts, emphasising the importance of social wellbeing, environmental stewardship, and economic prosperity (Slaper, 2011).

By adopting the triple bottom line approach, businesses aim to balance financial success with social responsibility and environmental sustainability, thereby fostering a more holistic measure of organisational success (Jonker, 2023). Research indicates that companies integrating triple bottom line principles often build stronger stakeholder relationships and enhance their long-term viability (Slaper, 2011). The growing emphasis on corporate social responsibility has contributed to the widespread adoption of the triple bottom line framework, as firms increasingly recognise its role in promoting sustainable business practices (Rhea, 2021).

The triple bottom line approach posits that companies should assess their social and environmental impacts alongside financial performance rather than focusing solely on profit generation (Elkington, 1994). The three elements of the framework, profit, people, and planet, serve as categories for firms to evaluate their environmental responsibilities and identify potential negative social impacts (Slaper, 2011). This evaluation encourages companies to integrate sustainable practices into all aspects of their operations, including supply chains, partnerships, and renewable energy usage, with the aim of positively impacting society and the environment while maintaining profitability (Jonker, 2023).

2.4 Ohlson Model, Value Relevance, Book Value and Earnings Value

In the field of financial accounting, the Ohlson model has emerged as a prominent framework for assessing value relevance, particularly in relation to a firm's financial statements (Ohlson, 1995). The Ohlson model posits that a firm's value can be

determined by the combination of its book value and earnings value (basic model). Book value refers to the net assets of a firm, as reflected on its balance sheet, while earnings value represents the present value of expected future earnings (Ohlson, 1995).Both components play a critical role in determining a firm's overall value, as they capture the financial performance and resources available to stakeholders (Feltham, 1995)

However, in the contemporary business landscape, there is a growing recognition of the importance of sustainability reporting, which expands beyond traditional financial reporting by incorporating sustainability reporting aspects (Krzua, 2010),As firms use more eco-friendly methods, people who have a stake in the companies are looking for details about their effects on society and the environment, since these are important factors that determine the value of the companies (KPMG, 2020).Therefore, it becomes pertinent to examine the relationship between sustainability reporting, firm value, and the value relevance of the Ohlson model.

Furthermore, this research acknowledges the moderating role of leadership competence, recognizing that effective leadership is essential for driving sustainable practices within organisations (Eisenbeiss, 2008). Leadership competencies encompass the abilities, traits, and actions that leaders employ to integrate sustainability into strategic decision-making. Bansal (Bansal, 2000) identified that organisational leaders' values significantly influence corporate ecological responsiveness, suggesting that leadership commitment is crucial for effective sustainability integration. Similarly, Preuss (Preuss, 2003) emphasised that leadership plays a pivotal role in embedding sustainability into corporate strategies, highlighting that proactive leadership can drive the adoption of sustainable practices. Building upon these insights, this research aims to examine how leadership competencies can enhance the relationship between sustainability reporting and firm value, utilizing the Ohlson model to assess the moderating effect of strong leadership on this dynamic.

Overall, this research aims to contribute to the understanding of the complex interplay between sustainability reporting, firm value, and the value relevance of the Ohlson model, with a specific focus on the moderating role of leadership competencies. Through empirical analysis and rigorous examination of relevant literature, this research intends to provide insights into how sustainability practices can influence a firm's financial performance and enhance its overall value in the eyes of shareholders, while considering the crucial role of leadership in this relationship.

2.4.1 Ohlson Model

Dr. O. J. Ohlson created the Ohlson Model, a popular financial model for valuing businesses. The worth of a firm is determined using fundamental financial data, including earnings, dividends, and book value. The model is regarded as a comprehensive approach to valuation because it incorporates both assets and liabilities into the calculation of value. The Ohlson Model research established a link between business valuation and residual income, becoming widely recognised as the residual income valuation model. Despite earlier discussions by scholars like (Bernard, 1995) (Biddle, 1997) who noted that the concept of residual income valuation had existed for some time, (Ohlson, 1995) deserves credit for successfully providing a structured and thorough explanation of this approach (Kothari, 2001).

The value of the firm's equity, according to early financial valuation theories, is based on the present value of all future dividends or free cash flows to equity. This determines the firm's value and assists in strategic decision-making. The Ohlson Model, however, refines this by associating a firm's value with accounting values. The model operates under three primary assumptions. First, it assumes that the economy is risk-free, that people have the same ideas about interest rates, and that interest rates are not volatile. These assumptions make intertemporal arbitrage pricing impossible. The second assumption is the "clean surplus connection," linking book value, income, and dividends, which has a direct connection to sustainability reporting. Lastly, it incorporates the linear information dynamics hypothesis, which ensures that the model remains both robust and predictive in estimating firm value.

Saleh (2016) research builds on the Ohlson Model by exploring its application in emerging markets like Malaysia, particularly in the context of sustainability reporting. Saleh (2016) emphasises that the "clean surplus connection" assumption provides a valuable framework for integrating financial and non-financial data into firm valuation, making the Ohlson Model particularly relevant in sustainability reporting practices (Saleh, The Integration of Sustainability Metrics into the Ohlson Model: Evidence from Emerging Markets, 2016). By demonstrating that sustainability metrics can enhance residual income-based valuations, his work highlights the model's adaptability in capturing firm value in dynamic and evolving market environments.

Similarly, Sori (2020) has expanded on the Ohlson Model by addressing its practical applications in the Malaysian context, particularly within public-listed companies. His studies reveal that the linear relationship between book value and earnings, as posited by the model, can be further enhanced when complemented by forward-looking metrics such as environmental, social, and governance (ESG) performance (Sori, 2020). Sori (2020) findings highlight the importance of integrating sustainability reporting into financial valuation, aligning with the clean surplus connection and reinforcing the model's relevance in modern financial analysis.

In conclusion, the literature review suggests that the Ohlson Model is a widely used and well-regarded tool for valuing companies. Its ability to accurately predict stock prices, combined with the adaptations provided by scholars like Salleh (2020) and Sori (2020), makes it a valuable resource for practitioners and academics. These contributions demonstrate the Ohlson Model's flexibility and potential for integrating financial and non-financial data to evaluate firm value comprehensively.

2.4.2 Value Relevance

Value relevance refers to the extent to which accounting information is reflected in firm value or stock returns, indicating its usefulness to investors in decision-making. While early valuation frameworks established the theoretical linkage between accounting numbers and firm value (Ohlson, 1995; Barth, 2001), recent studies emphasise that value relevance represents a statistical association between financial reporting information and market-based measures of firm performance (Beisland, 2021). Contemporary literature further explains that accounting information is value relevant when it captures and summarises economic information that influences share prices and investor expectations (Kwon, 2022).

Recent empirical research has increasingly examined value relevance in the context of evolving reporting environments, particularly following the widespread adoption of International Financial Reporting Standards (IFRS). These studies suggest that improvements in reporting quality, transparency, and comparability enhance the value relevance of accounting information, although the magnitude of this association varies across institutional settings and market conditions (Palea, 2021). Collectively, recent evidence supports the view that value relevance reflects the ability of financial

statements to convey decision-useful information that is incorporated into firm valuation by capital market participants.

2.4.3 Book Value, Earnings and Share Price Models

Book value represents a firm's total assets minus total liabilities, while earnings in this study are measured as earnings after interest and taxes. The price model provides a widely accepted framework for examining the association between accounting information and share prices, offering a strong conceptual basis for understanding how market values reflect accounting variables (Ohlson, 1995; Beisland, 2021). Alternatively, the return model may be employed to test the stated hypotheses by examining the statistical relationship between stock returns and changes in accounting earnings (Kwon et al., 2022).

Comparatively, the price model is often considered to have advantages over the return model. Recent evidence suggests that the price model is economically better specified and produces less biased coefficient estimates, particularly in studies focusing on firm valuation and long-term value relevance (Ahmed et al., 2023; Palea, 2024). Nevertheless, contemporary methodological literature emphasises that the choice between price and return models should ultimately be guided by the research objectives, hypotheses development, and econometric considerations rather than model preference alone (Beaver et al., 2020). The Ohlson (1995) price model is stated as follows:

$$P_{it}=a_0 + a_1EPS_{it} + a_2BVS_{it} + \xi_{it} \quad (2.1)$$

To examine the individual and relative predictive power of book value and earnings, two separate regression models are derived from the baseline price model. This model decomposition approach was originally proposed by Theil (1971) and has since been widely adopted in value relevance research to disentangle the incremental explanatory power of earnings and book value components (Kadri,2012; Beisland, 2021; Kwon et al., 2022; Palea, 2024). By estimating separate earnings-only and book-value-only models, this study can assess the extent to which each accounting variable independently explains variations in share prices.

The decomposition of the model is specified as follows:

$$P_{it}=b_0 + b_1EPS_{it} + \xi_{it} \quad (2.2)$$

$$P_{it}=c_0 + c_2BVS_{it} + \xi_{it} \quad (2.3)$$

where:

P_{it} is market price per share for firm i at time t, three months after the end of the accounting year of time t.

a_0 is intercept term (constant): Represents the average market price per share when both EPS and BVS are 0. It captures influences on share price not explained by earnings or book value.

b_0 is intercept term for the earnings-only model.

c_0 is intercept term for the book-value-only model.

EPS_{it} is the earnings per share of firm i at time t.

BVS_{it} is the book value per share of firm i at time t; and

ξ_{it} is other value relevant data.

2.4.4 Selection of Ohlson Model Fair Value over Tobin's Q Model

The decision to employ the Ohlson valuation model rather than the Tobin's Q model for assessing firm value in this research is grounded in several conceptual and empirical considerations. The Ohlson model provides a comprehensive valuation framework by integrating book value and earnings information, thereby offering a holistic representation of a firm's financial position and performance (Ohlson, 1995). Subsequent developments and empirical validations confirm that this integration captures a firm's intrinsic value and its capacity to generate future economic benefits more effectively than single-measure valuation models (Barth, 2001; De, 2021).

The suitability of the Ohlson model is particularly relevant in the context of sustainability reporting, where firm value is increasingly influenced by non-financial

information alongside traditional accounting measures. Recent empirical studies demonstrate that valuation models grounded in accounting fundamentals, such as the Ohlson model, are better able to incorporate sustainability-related information when explaining market value (Bhatia, 2020; De Klerk, De, 2022). This aligns with growing stakeholder demand for a broader assessment of firm value that extends beyond short-term financial indicators.

In contrast, the Tobin's Q model evaluates firm value primarily in relation to the replacement cost of assets, focusing on investment efficiency and market expectations of growth opportunities (Brounen, 2004). While useful for certain strategic and investment analyses, Tobin's Q may inadequately capture the broader value implications associated with sustainability reporting, particularly those related to long-term performance, stakeholder confidence, and non-financial value drivers.

Accordingly, within the framework of this investigation into sustainability reporting and firm value, the Ohlson model is deemed more appropriate due to its ability to integrate financial fundamentals with value-relevant non-financial information and its strong empirical support in contemporary accounting research. This study therefore employs the Ohlson model to examine the relationship between sustainability reporting and firm value, while assessing the moderating role of leadership competencies in strengthening this relationship.

2.5 Sustainability Reporting

The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UNESCO, 2025). This definition emphasises the importance of balancing environmental, societal, and economic considerations to achieve an improved quality of life for all. However, in practice, there is no universally agreed definition of the term sustainability. According to Bursa Malaysia (2015), the predominant global definition of sustainability originates from the Brundtland Report of the World Commission on Environment and Development, which defines sustainability as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Bursa, 2015). Sustainability reporting serves dual purposes within an organization. On one hand, it reflects a company's commitment to corporate social

responsibility (CSR) and public engagement, often enhancing brand image and stakeholder relations (PRLab., 2024). On the other hand, effective sustainability reporting addresses material business concerns that are strategic and can influence the organization's financial (Bureau, 2021). By integrating sustainability into core business strategies, organizations can enhance transparency, mitigate risks, and drive long-term value creation.

Sustainability reporting has always emphasised the business sector rather than the public sector (Williams, 2011). (Farneti, 2009) concurred with this assertion and proposed that the public sector should also be examined through the lens of sustainability and its reporting.

Sustainability reporting refers to an organisational document that highlights a company's economic, environmental, and social performance. It involves the reporting of non-financial information (Saleh, 2016) that reflects the extent to which firms integrate sustainability components into their core business strategies and effectively communicate their sustainability initiatives to stakeholders (Saleh, 2020).

The Sustainability Reporting Guide issued by Bursa Malaysia (Bursa, 2015) outlines the objectives of requiring listed companies to produce sustainability reports. These objectives include improving the quality of sustainability practices and reporting among public-listed companies, supporting these entities in meeting stakeholders' sustainability expectations, attracting sustainability-driven investments to the Malaysian capital market, and increasing the number of companies eligible for inclusion in global sustainability indices, such as the FTSE4 Good Bursa Malaysia Index.

Typically, the investment community examines sustainability through three dimensions: economic, environmental, and social. However, Bursa Malaysia has adopted the terminology of economic, environmental, and social in its Sustainability Reporting Guidelines, excluding the governance component (Bursa, 2015) .The three-pillar framework of sustainability is often associated with the term 'triple bottom line' as articulated by (Lonkani, 2018). The following is a concise explanation of the three dimensions: economic, environmental, and social.

Sustainability encompasses three dimensions: economic, social, and environmental. “Although trade-offs may arise between these dimensions, they are interrelated in multiple ways.” For instance, demonstrating social and environmental responsibility towards employees, communities, and other stakeholders fosters increased trust, hence facilitating sound business practices. Social and environmental

responsibilities must be integrated with economic prosperity. Organisations must persist in delivering products and services that meet consumer demand to produce profits, foster growth, and create new employment opportunities. In pursuing economic objectives, organisations must also evaluate their social and environmental effect to ensure they create added value for both the firm and its stakeholders. There are three forms of sustainability reporting: economic sustainability, environmental sustainability, and social sustainability.

2.6 Firm Value

Firm value serves as a critical measure of a company's overall financial health and long term sustainability. It reflects investors' perceptions of a firm's future earnings potential, stability, and risk profile. The concept of firm value extends beyond financial performance to encompass aspects such as governance quality, risk management, and corporate sustainability initiatives. Firm value is commonly measured using indicators such as market capitalisation, book value, return on assets, and return on equity.

A company's market value is primarily determined by its ability to generate consistent profits and sustain growth over time. Dahmash et al. (2022) highlighted that net income plays a significant role in boosting market confidence, which in turn enhances firm valuation. Their study demonstrated that firms with higher earnings tend to experience increased investor trust, resulting in higher stock prices and improved access to capital. Similarly, Bui et al. (2023) found that a firm's capital structure significantly influences firm value, with companies maintaining an optimal balance between equity and debt generally achieving higher market valuations.

The relationship between financial performance and firm value is further emphasised in studies focusing on Malaysian firms. Sori and Saleh (2021) examined the role of financial transparency and reporting quality in shaping firm valuation. Their findings suggest that companies with comprehensive and accurate financial reporting are more likely to be perceived as lower risk by investors, leading to improved firm value. This aligns with earlier research by Halim (2020), which found that financial reporting quality serves as a strong determinant of firm value, as it enhances investor confidence and market credibility.

Another important determinant of firm value is corporate governance. Governance structures influence firm valuation by ensuring accountability, protecting

shareholders' interests, and minimising agency conflicts. In Malaysia, regulatory frameworks such as the Malaysian Code on Corporate Governance emphasise the importance of board independence, leadership transparency, and risk management in shaping firm value (Saleh, 2021). Firms with strong governance mechanisms often experience higher valuations, as investors recognise their ability to manage risks effectively and sustain long term growth.

The role of leadership in determining firm value is another area of growing interest. Chief Executive Officer characteristics, including experience, tenure, and financial expertise, have been found to significantly influence firm value. A study by Almaqtari et al. (2024) revealed that firms led by chief executive officers with strong financial backgrounds tend to outperform those led by executives lacking such expertise. This is particularly relevant in Malaysia, where leadership competencies play a crucial role in shaping corporate strategies and financial outcomes.

Macroeconomic factors also influence firm value. Economic conditions such as interest rates, inflation, and exchange rates affect investor sentiment and corporate earnings, thereby shaping firm valuation. Dahmash et al. (2022) found that firms operating in stable macroeconomic environments tend to enjoy higher market valuations due to reduced financial volatility and stronger investor confidence. This is particularly relevant in emerging markets such as Malaysia, where economic fluctuations can significantly affect firm value.

In summary, firm value is influenced by multiple factors, including financial performance, and leadership characteristics. Malaysian firms benefit from strong financial reporting practices, and experienced leadership in enhancing their market valuation.

2.7 The Significance of Sustainability Reporting and Firm Value

Sustainability reporting has become an essential tool for companies to communicate their economic, environmental, and social performance to stakeholders. The practice of sustainability reporting enables companies to disclose their sustainability reporting, commitments, and targets, providing stakeholders with valuable information to make informed decisions. The importance of sustainability reporting is increasingly acknowledged by companies and investors, as it has been

associated with enhanced financial performance, reputation, and stakeholder engagement.

Numerous studies have highlighted the benefits of sustainability reporting for companies. For instance, research by Eccles, (2013) found that companies reporting on sustainability issues are more likely to achieve financial success. Additionally, a report by KPMG, (2017) revealed a positive correlation between sustainability reporting, improved financial performance, and better risk management.

Sustainability reporting has also been found to improve stakeholder engagement and reputation. Research by (PwC, 2016) found that companies that report on sustainability are more likely to attract and retain customers, employees, and investors. Research conducted by Smith, (2019) demonstrated a positive relationship between sustainability reporting and investor attraction, highlighting the importance of disclosing sustainability reporting related information. In the context of Malaysia, a country that places growing emphasis on sustainability, understanding the impact of sustainability reporting on firm value is particularly relevant. Furthermore, sustainability reporting has been associated with enhanced environmental and social performance. Research by Ioannou, (2016) revealed that companies voluntarily disclosing their sustainability reporting performance often achieve stronger outcomes in environmental and social metrics.

Stakeholder theory asserts that enterprises bear the obligation to generate value for all stakeholders, rather than focussing solely on shareholders. The value of a firm holds significant importance for stakeholders, as it correlates with their enhanced prosperity.

The concept of firm value pertains to the economic assessment of a business. While examining various studies, Lonkani, (2018) characterised firm value “as the value of explicit contracts among monetary stakeholders, including shareholders and debt holders”.

From the standpoint of investors, the fluctuations in beliefs and factor returns may significantly influence their perceptions and actions regarding the value of a business firm (Merkle, 2021).The literature examines various factors that may serve as predictors of firm value, including governance within a high-quality reporting environment (Renders, 2012) ownership structure (Byun, 2013), firm growth and profitability (Sudiyatno, 2021) along with risk management and voluntary reporting (Azim, 2015) .Conversely, it was observed that firm value exhibited a negative

correlation with variables such as firm size (Situmorang, 2019)and the interplay between firm growth and capital structure in relation to profitability (Sudiyatno, 2021).

From a sustainability perspective, current literature presents evidence regarding the relationship between sustainability reporting or reporting and various dimensions of firm value and performance. For example, Hongming, (2020) documented favourable impacts of sustainability reporting indicators, including environmental, health and safety, and social dimensions, along with the aggregated sustainability reporting index on the value of firms in Pakistan. In Malaysia, the research conducted by Nazaria, (2021) highlighted the noteworthy correlation between sustainability reporting and factors such as firm size, profitability, and achievements, based on an analysis of annual data from 60 companies spanning the years 2014 to 2016.

Research conducted in China regarding sustainability reporting and its impact on firm value by Yuanyuan, (2018) indicates a positive correlation between sustainability reporting and firm value. Furthermore, it was observed that state-owned enterprises derive greater advantages from sustainability reporting, as it elicits favourable responses from stakeholders for these organisations.

Sustainability reporting is typically linked to favourable results for companies, such as enhanced reputation and stakeholder engagement; however, there may be cases where the connection between sustainability reporting and firm value reveals adverse effects. Certain research has suggested that the expenses linked to the adoption of comprehensive sustainability reporting practices, including data collection, assurance processes, and the upkeep of transparency, can be considerable and may not necessarily yield immediate financial benefits (Khan, 2016). Furthermore, should sustainability reporting fail to align with a company's fundamental business strategy or be viewed as a superficial endeavour lacking authentic dedication to sustainability, it may result in allegations of greenwashing, which could harm the company's reputation and erode investor confidence (Marquis, 2014). The presence of such unfavourable perceptions could lead to a deterioration in the value of the firm, as investors and stakeholders may begin to scrutinise the authenticity and enduring dedication of the firm to sustainable practices. In conclusion, sustainability reporting serves as a crucial mechanism for companies to disclose their sustainability performance, commitments, and objectives to stakeholders. This practice has been linked to improved financial performance, a strengthened corporate reputation, increased stakeholder engagement, and positive environmental and social impacts.

Consequently, it is hypothesised that:

H_1: There is a positive relationship between sustainability reporting and firm value

2.7.1 Economic Sustainability and Firm Value

The triple bottom line (TBL) is an economic sustainability reporting methodology that evaluates a business's performance in three essential domains: profit, people, and planet. The TBL broadens traditional commercial success indicators to encompass an organization's contributions to social welfare, environmental sustainability, and an Economic sustainability pertains to a firm's responsibility to generate profit to ensure its continued existence as an entity (Roxas, 2012).

The economic dimension of sustainability, according to the GRI Standards, pertains to "an organisation's impacts on the economic conditions of its stakeholders, and on economic systems at local, national, and global levels" (GRI, 2016).This element does not concentrate on the organization's financial status (Bursa, 2015).

The GRI Standards comprise an extensive collection of reporting requirements addressing multiple facets of sustainability reporting, encompassing economic, environmental, and social dimensions. Economic sustainability is often addressed through the GRI Standards under the "economic" element. This component offers specific economic indicators to assist organisations in reporting their economic performance and contributions. These indicators may encompass data pertaining to economic effects, financial performance, market presence, and indirect economic impact. (GRI, 2021)

Economic sustainability reporting entails the reporting of a company's economic performance and financial health within its sustainability reporting (KPMG, 2020). This encompasses data regarding the firm's sales, profits, investments, and other financial metrics, together with its plans and efforts aimed at generating long-term economic value while addressing risks and opportunities associated with economic sustainability.

Economic sustainability reporting is a vital aspect of sustainability reporting, as it helps stakeholders understand the economic impact of a firm's activities and its ability to create long-term value. It can assist firms in pinpointing areas for enhancing economic performance, including cost reduction, efficiency improvement, or the development of new business models.

Key topics and challenges commonly addressed in economic sustainability reporting include financial performance, which refers to data on the firm's revenues, profits, and other financial metrics, along with trends and comparisons over time and with peer companies in the same sector. Another focus is economic value creation, which relates to how the firm generates value for its stakeholders through activities such as job creation, economic growth, tax contributions, and support for local communities. Risk management is also a significant area, highlighting the firm's policies and initiatives aimed at mitigating economic risks, including market volatility, supply chain disruptions, and changes in regulations. Innovation and growth are equally important, reflecting the firm's efforts to develop new goods, services, and business models that create economic value while fostering sustainable development (Adams, 2002).

Economic sustainability reporting can influence firm value both positively and negatively. Economic sustainability reporting can enhance a firm's openness and accountability, resulting in enhanced stakeholder interactions and heightened investor trust. This may lead to elevated stock values and enhanced access to capital markets (Loh, 2017). The adoption of economic sustainability reporting may entail significant costs for companies, with no assurance of enhancing financial performance. Organizations risk facing criticism or backlash from stakeholders if their sustainability reporting is deemed insufficient or lacking credibility (Adams, 2002).Additionally, failing to meet stakeholder expectations regarding sustainable practices can expose companies to legal challenges and reputational risks, further complicating their efforts to achieve sustainability objectives (Clarkson, The relevance of environmental disclosures: Are such The relevance of environmental disclosures: Are such, 2013).

Consequently, although economic sustainability reporting offers numerous advantages for companies, it is crucial for them to meticulously evaluate the costs and risks linked to sustainability reporting prior to its implementation.

Economic sustainability is essential for augmenting corporate value by guaranteeing long-term profitability and durability. Organisations that proficiently use economic sustainability strategies can enhance resource efficiency, lower expenses, and stimulate innovation, resulting in superior financial performance. This, thus, bolsters investor confidence and draws additional investment, leading to increased corporate valuation. Furthermore, economic sustainability methods assist organisations in alleviating risks linked to market fluctuations and regulatory alterations, thereby enhancing their financial stability and growth potential. Recent studies suggest that

companies implementing strong economic sustainability measures often outperform their competitors in stock market performance and overall financial health (Bhimani, 2023).

It is hypothesised that:

H_{2a}: There is a positive relationship between economic sustainability reporting and firm value.

2.7.2 Environmental Sustainability and Firm Value

Stakeholder theory posits that organizations have a responsibility to create value for all stakeholders, not just shareholders. This idea posits that enterprises ought to account for the interests of all stakeholders, including employees, customers, suppliers, and the community, during decision-making processes (Friske, 2023). Malaysians recognise the need of environmental conservation, as seen by their responses to notable incidents such as the 1993 Highland Towers fall and the 1997 haze crisis. A significant share of the responsibility for the escalating pollution and consequent degradation of the natural habitat and ecosystem has been mostly ascribed to Malaysian enterprises (Malcom, 2007). The environmental aspect of sustainability pertains to "an organization's influence on living and non-living natural systems, encompassing land, air, water, and ecosystems" (Bursa, 2015). As stated by (Loh, 2020) this pillar of sustainability pertains to natural resources concerning energy, air, water supply, raw materials, biodiversity, goods, and services. Environmental sustainability constitutes the second criterion outlined in the GRI 300 guideline (Jalila, 2019).

Environmental sustainability in sustainability reporting pertains to the reporting of an organization's environmental impacts and the strategies implemented to alleviate these effects and foster enduring environmental sustainability (GRI, 2016). This entails quantifying and documenting essential environmental performance indicators, including greenhouse gas emissions, water and energy usage, waste production and management, biodiversity preservation, and other ecological effects.

Various frameworks and standards exist for environmental sustainability reporting, including the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), and the Task Force on Climate-related Financial Reporting (TCFD) (Disclosures, 2017). These frameworks offer direction on identifying and reporting environmental sustainability challenges, as well as integrating

sustainability considerations into corporate strategy and decision-making. Improving corporate environmental sustainability can preserve a company's efficiency, increase its value, and fulfil stakeholder expectations (Villiers, 2012). Conversely, environmental sustainability reporting can incur significant costs for companies, and there is no assurance that it will enhance financial success. Firms may face backlash from stakeholders if their sustainability reporting is perceived as inadequate or insincere. Moreover, companies may encounter legal and reputational difficulties if they do to fulfil stakeholder expectations for their sustainable policies (Loh, 2017).

Environmental sustainability dramatically impacts business value by improving a company's reputation and operational efficiency. Organisations that implement comprehensive environmental sustainability measures, including the reduction of carbon emissions, waste minimisation, and resource conservation, are likely to appeal to environmentally aware investors and consumers. Enhanced stakeholder support might result in elevated sales and market share, thus augmenting business worth. Furthermore, companies that actively oversee their environmental impact are more likely to adhere to regulations, evade penalties, and mitigate the risks linked to environmental liabilities. Recent studies demonstrate that companies with robust environmental sustainability programs frequently achieve enhanced financial performance and elevated stock prices relative to their less sustainable peers (Nguyen, 2023).

It is hypothesised that:

H_{2b}: There is a positive relationship between environmental sustainability and firm value.

2.7.3 Social Sustainability and Firm Value

Stakeholder theory asserts that organisations must generate value for all stakeholders, rather than solely for shareholders. This idea posits that enterprises ought to account for the interests of all stakeholders, including employees, customers, suppliers, and the community, in their decision-making processes (Friske, 2023).

Social sustainability is integral to the overarching discourse on contemporary sustainability. The social aspect of sustainability pertains to an organization's influence on the social systems in which it functions (Bursa, 2015). The social dimension of sustainability encompasses issues pertaining to human factors, including human rights,

occupational health and safety, labour practices, pricing, corruption, and corporate citizenship (Loh, 2020). Social sustainability constitutes the third criterion under the GRI standards, categorised under code 400 (Jalila, 2019).

Various recent studies have sought to develop conceptual frameworks that systematise the diverse and fragmented literature on social sustainability across different disciplinary and institutional contexts. Contemporary scholars have contributed to clarifying the core dimensions of social sustainability and linking them more explicitly to sustainable development objectives (Missimer, 2017). These studies commonly identify key social sustainability components, including social equity, inclusion, access to essential services, employment opportunities, community well-being, and social cohesion.

More recent frameworks further emphasise the role of institutional quality, participatory governance, and human rights as integral elements of social sustainability, highlighting the importance of democratic processes, transparency, and effective institutions in supporting long-term societal stability (Sachs et al., 2022). In addition, contemporary literature recognises cultural continuity and adaptive capacity as essential aspects of social sustainability, stressing the need to balance societal change with the preservation of social identity and collective values (Missimer et al., 2017).

Despite these advances, recent reviews note that social sustainability remains less precisely operationalised than environmental and economic dimensions, with many studies still treating social elements broadly within the wider sustainability agenda rather than examining them in depth as a distinct analytical construct (Purvis, 2019). This limitation underscores the need for more focused empirical research that clearly delineates social sustainability indicators, particularly in firm-level sustainability reporting contexts.

The community must participate in social learning to enhance its ability to make informed judgements regarding complex topics to address the challenges of sustainable living. Social sustainability is attained when both official and informal processes, institutions, and linkages effectively foster the capacity of current and future generations to create viable and healthy communities. Community structures and processes should be democratic, promoting involvement and engagement, with governance prioritising transparency and accountability to promote social sustainability.

Social sustainability is achieved when formal and informal institutions, social structures, and community networks collectively enhance the capacity of present and future generations to develop inclusive, resilient, and liveable communities. Contemporary literature emphasises that social sustainability requires democratic participation, stakeholder engagement, and governance systems grounded in transparency and accountability, which together support long-term social well-being and institutional trust (Sachs et al., 2022).

Social sustainability is a vital element in augmenting corporate value, since it includes actions that foster social well-being and equal treatment both internally and externally. Organisations that engage in social sustainability initiatives, including equitable labour practices, community involvement, and diversity and inclusion programs, frequently experience enhanced brand reputation and heightened customer loyalty. Such practices can result in a more motivated and productive workforce, reduced turnover rates, and improved employee satisfaction. Consequently, companies with strong social sustainability strategies can attain enhanced operational efficiency and innovation, resulting in superior financial performance and elevated company value (Garcia, 2023).

Moreover, social sustainability measures can alleviate risks related to social unrest, regulatory penalties, and adverse publicity. By cultivating constructive relationships with stakeholders, such as employees, customers, and the community, organisations can establish a robust business model that is more adept at navigating social and economic issues. This proactive strategy for addressing social risks and possibilities protects the firm's reputation, bolsters investor confidence, and draws socially responsible investments. Recent studies indicate that companies with robust social sustainability procedures generally exhibit superior long-term financial success and elevated stock market valuations relative to those that neglect social sustainability (Garcia, 2023).

Consequently, it is posited that:

H_{2c}: There is a positive relationship between social sustainability and firm value.

2.8 Leadership and its Role in Organisations

Barron, (2016) defines leadership as the capacity to motivate and inspire individuals to collaborate towards a shared objective, accompanied by specific

expectations of outcomes. It is a key determinant associated with the success or failure of any organisation (Khajeh, 2018). It plays a crucial role in creating vision and mission, determining and establishing organisational objectives, strategies, and policies, as well as implementing methods and coordinating efforts to achieve the planned objectives (Xu, 2008). Leadership and leadership competencies are essential factors in organisational success. Leadership encompasses the capacity to formulate and convey a vision, align and inspire employees, and cultivate an environment conducive to innovation and learning (Boyles, 2023).Leadership competencies encompasses the skills, qualities, behaviours, and traits necessary for effective leadership (Boyles, 2023). Examples of leadership competencies encompass strategic thinking, emotional intelligence, communication, decision-making, and adaptability (Boyles, 2023). Effective leadership positively influences organisational performance, innovation, and sustainability (Boyles, 2023). Giles, (2016) discusses the essential leadership competencies identified by leaders globally. Leaders with appropriate competencies can establish a sense of purpose and direction, cultivate trust and credibility, and enhance stakeholder engagement and collaboration (Giles, 2016). They can anticipate and respond to changing market conditions, customer needs, and social and environmental challenges, thereby enabling the firm to seize new opportunities and create long-term value for all stakeholders. It is essential for organisations to cultivate leadership competencies across all levels (Giles, 2016).

Salleh, (2016) highlights the pivotal role of leadership competencies in driving organisational sustainability and innovation. His research highlights that effective leadership involves integrating sustainability into core business strategies while fostering stakeholder collaboration to achieve long-term (Saleh, 2016).Salleh, (2020) further emphasises that leadership competencies is particularly crucial in emerging markets, where adaptive and strategic decision-making capabilities are essential to navigating unique economic, social, and environmental challenges (Salleh, 2020).By developing robust leadership competencies, organisations can align their operations with sustainability objectives and enhance their overall performance.

Leadership's role in organisations is a subject of active discourse in the literature. Numerous studies establish a connection between leadership and organisational performance (Wiengarten, 2017). Furthermore, additional studies have indicated that leadership may serve a moderating role in the relationship between different facets of business performance. This encompasses the buyer-supplier

relationship (Awan, 2021), the performance of work systems and employees (Ximenes, 2019) along with employee and customer satisfaction and organisational performance (Wongsurawat, 2020). Leadership is recognised as a critical element in driving transformational change and advancing the social responsibility of organizations within the sustainability domain (Kim, Relationship of ethical leadership, corporate social responsibility and organizational performance, 2018). Leadership is associated with organisational culture and company-wide decision-making processes in sustainability management (Kiesnere, 2020), as well as social and environmental sustainability (Amisano, 2017)

2.8.1 Leadership Competencies and Sustainability Reporting

Barron, (2016) defines leadership as the capacity to motivate and inspire individuals to collaborate towards a shared objective, accompanied by specific expectations of outcomes. It is a key determinant associated with the success or failure of any organisation (Khajeh, 2018). It plays a crucial role in creating vision and mission, determining and establishing organisational objectives, strategies, and policies, as well as implementing methods and coordinating efforts to achieve the planned objectives (Xu, 2008). Leadership and leadership competencies are essential factors in organisational success. Leadership encompasses the capacity to formulate and convey a vision, align, and inspire employees, and cultivate an environment conducive to innovation and learning (Boyles, 2023). Leadership competencies encompass the skills, qualities, behaviours, and traits necessary for effective leadership (Boyles, 2023). Examples of leadership competencies encompass strategic thinking, emotional intelligence, communication, decision-making, and adaptability (Boyles, 2023). Effective leadership positively influences organisational performance, innovation, and sustainability (Boyles, 2023). Giles, (2016) discusses the essential leadership competencies identified by leaders globally. Leaders with appropriate competencies can establish a sense of purpose and direction, cultivate trust and credibility, and enhance stakeholder engagement and collaboration (Giles, 2016). They can anticipate and respond to changing market conditions, customer needs, and social and environmental challenges, thereby enabling the firm to seize new opportunities and create long-term value for all stakeholders. It is essential for organisations to cultivate leadership competencies across all levels (Giles, 2016).

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Therefore, the following hypotheses are developed:

H_3: Leadership competencies have a significant moderating effect on the relationship between sustainability reporting and firm value of Malaysian public-listed companies.

2.8.2 Hypothesis Development and Hypothesis Statements

Guided by the conceptual framework and the theoretical arguments discussed in this chapter, this study develops hypotheses to examine the relationship between sustainability reporting and firm value among Malaysian public-listed companies. Prior literature suggests that sustainability reporting enhances firm value through improved transparency, stakeholder confidence, and long-term strategic orientation, thereby reducing information asymmetry and enhancing market valuation (Plumlee, 2015).

Accordingly, this study posits that overall sustainability reporting is positively associated with firm value (H_1). To provide more detailed insights, the economic, environmental, and social dimensions of sustainability reporting are expected to individually contribute to firm value (H_{2a}, H_{2b}, and H_{2c}), consistent with the triple bottom line perspective that links sustainability performance to long-term value creation (Loh, 2007). In addition, given the strategic role of leadership in shaping sustainability practices and reporting effectiveness, leadership competencies are expected to influence the strength of this relationship, as suggested by upper echelons theory and leadership competency theory (Pless, 2012). Accordingly, this study proposes that leadership competencies moderate the relationship between sustainability reporting and firm value (H_3), as later summarised in Table 2.1.

Table 2.1
Summary of Research Hypotheses

Hypothesis	Hypothesis Statement
H_1	There is a positive relationship between sustainability reporting and firm value.
H_{2a}	There is a positive relationship between economic sustainability reporting and firm value.
H_{2b}	There is a positive relationship between environmental sustainability reporting and firm value.
H_{2c}	There is a positive relationship between social sustainability reporting and firm value.
H_3	Leadership competencies significantly moderate the relationship between sustainability reporting and firm value of Malaysian public-listed companies.

2.8.3 Leadership Competencies and Firm Value

Leadership competencies enhance a leader's ability to articulate a clear vision, align and motivate employees, and foster a culture of innovation and learning, thereby improving the firm's competitive advantage and overall performance (Kruse, 2019). It builds trust and credibility among stakeholders, including customers, suppliers, investors, and regulators, which strengthens the firm's reputation and reduces transaction costs and risks (Kozminski, 2022). Leadership competencies enable leaders to anticipate and respond effectively to evolving market conditions, customer needs, and social and environmental challenges, allowing the firm to seize new opportunities and create long-term value for all stakeholders (Miller, 2023).

Salleh, (2016) emphasises that leadership competencies are a critical driver of sustainability and innovation in Malaysian firms. His research highlights that competent leaders integrate sustainable practices into core business strategies while engaging stakeholders and fostering organisational resilience. Leadership competencies not only enhance the quality of decision-making but also drives the successful implementation of sustainable practices, which improves firm value and stakeholder trust (Saleh, 2016). In the context of Southeast Asia, leadership competencies have been shown to foster innovation and adaptability, creating competitive advantages in a rapidly changing business environment (Koh, 2022). Studies of Malaysian firms further demonstrate that leadership competencies positively impact innovation performance, which translates into higher firm value and long-term success (Hendratama, 2021).

Leadership competencies also foster stakeholder engagement and trust, strengthening the firm's reputation and legitimacy among customers, investors, regulators, and society at large. Competent leadership is essential for aligning organisational strategies with changing market dynamics and sustainability goals.

2.9 Research Model

Drawing on both the leadership theory and the sustainability practices by leaders in Malaysian public-listed companies, the following research model as illustrated in Figure 2.2 is proposed to depict the relationship between sustainability reporting and firm value, with leadership competencies the moderating variable of the relationship.

The proposed research model is developed by adapting several frameworks or models as proposed and used in several studies, which are the (GRI, 2013) (Loh, 2017)

The independent variable is defined as sustainability reporting, encompassing the overall level of reporting and three key indicators: economic sustainability, environmental sustainability, and social sustainability (GRI, 2013)

The dependent variable is defined as firm value (Loh, 2017) also referred GRI in examining the relationship between firms' sustainability reporting and firm value among listed companies. In their research, the model developed by Ohlson (Ohlson, 1995) was employed as the baseline model, which is as similarly practised by Berthelot (Berthelot, 2012) to produce the firm value variable.

The moderating variable used in this research, which is leadership competencies, is adapted from the research by Wahda, (2019). In the research, Wahda, (2019) developed a framework to represent a chain of impact which can form the link between leadership competencies and business performance as well as other organisational outcome measures. In the framework, management capability includes four different inputs, namely knowledge, skills, attitudes, and experience, as well as management rules and systems (Wahda, 2019).

2.10 Conceptual Framework

This research conceptual framework suggests that as level of sustainability reporting increases, firm value is expected to increase. This assumes that stakeholder increasingly value sustainable business practices.

The moderator, leadership competencies is proposed to influence how strongly sustainability reporting affects firm value. Effective leadership may enhance the positive impact of sustainability reporting on firm value, while poos leadership competencies might weaken this relationship.

Sustainability reporting is the research's independent variable. Sustainability reporting is the research's independent variable. High level of sustainability reporting is expected to positively impact firm value. The dependent variable under this research is firm value. The Ohlson Model of Value Relevance is used to quantify firm value.

Finally, leadership competencies are moderator. Leadership competencies play a moderating role, influencing the strength and direction of the relationship between sustainability reporting and firm value.

2.11 Research Framework

This research model, illustrated in Figure 2.2, is developed based on leadership theory and sustainability practices utilised by leaders in Malaysian public-listed corporations. This demonstrates the correlation between sustainability reporting and business value, with leadership competencies acting as the moderating component in this correlation. The proposed research model is developed by adapting various frameworks or models employed in several studies, including the (GRI, 2013), (Loh, 2017), and the management competencies indicators framework (Tamkin, 2002).

The independent variable is characterised as sustainability reporting, which includes the extent of sustainability reporting and three indicators: economic sustainability, environmental sustainability, and social sustainability (GRI, 2013)

The suggested research model seeks to examine the interaction of sustainability reporting, leadership abilities, and company value, offering a detailed comprehension of these linkages within Malaysian public-listed corporations. The independent variables in the model include sustainability reporting and its three dimensions: economic, environmental, and social sustainability. These variables jointly signify the extent and scope of a firm's dedication to sustainable practices. The dependent variable, firm value (assessed as market value), represents the financial and reputational consequences that may be affected by sustainability policies. Leadership competencies are presented as a moderating variable to evaluate their influence on enhancing or diminishing the effect of sustainability reporting on business value.

The model is designed to evaluate many possibilities. The initial hypothesis (H_1) asserts a direct correlation between sustainability reporting and market value. Additionally, H_{2b}, H_{2b}, and H_{2c} examine the substantial associations between economic, environmental, and social sustainability reporting and market value, acknowledging that these dimensions may affect company value through distinct methods. Economic sustainability may directly augment profitability, whilst environmental and social sustainability can strengthen stakeholder trust and brand reputation, so indirectly adding to market value. Leadership qualities are posited to modulate these associations, H_{2a}, H_{2b}, and H_{2c}, indicating that effective leadership amplifies the strategic incorporation of sustainability practices into organisational operations, therefore enhancing their effect on company value.

This model emphasises the significance of sustainability reporting as a multifaceted concept and presents leadership as a vital element in connecting sustainable practices with measurable financial results. The research seeks to offer empirical data and practical insights for policymakers and corporate executives in Malaysia by analysing these links to promote sustainable growth and improve organisational value.

The research model in my thesis is based on (Shah I. A., 2020) research on the relationship between sustainability reporting and firm value. The model focuses on economic, environmental, and social sustainability dimensions and their impact on firm value. Leadership competencies play a significant role in moderating this relationship, enhancing the effectiveness of sustainability initiatives. The model assumes that economic sustainability has a more direct impact on firm value than environmental and social sustainability, which may indirectly influence firm value through enhanced reputation and stakeholder engagement. The model was adaptable to the Malaysian corporate context, allowing for exploration of unique cultural, regulatory, and market dynamics.

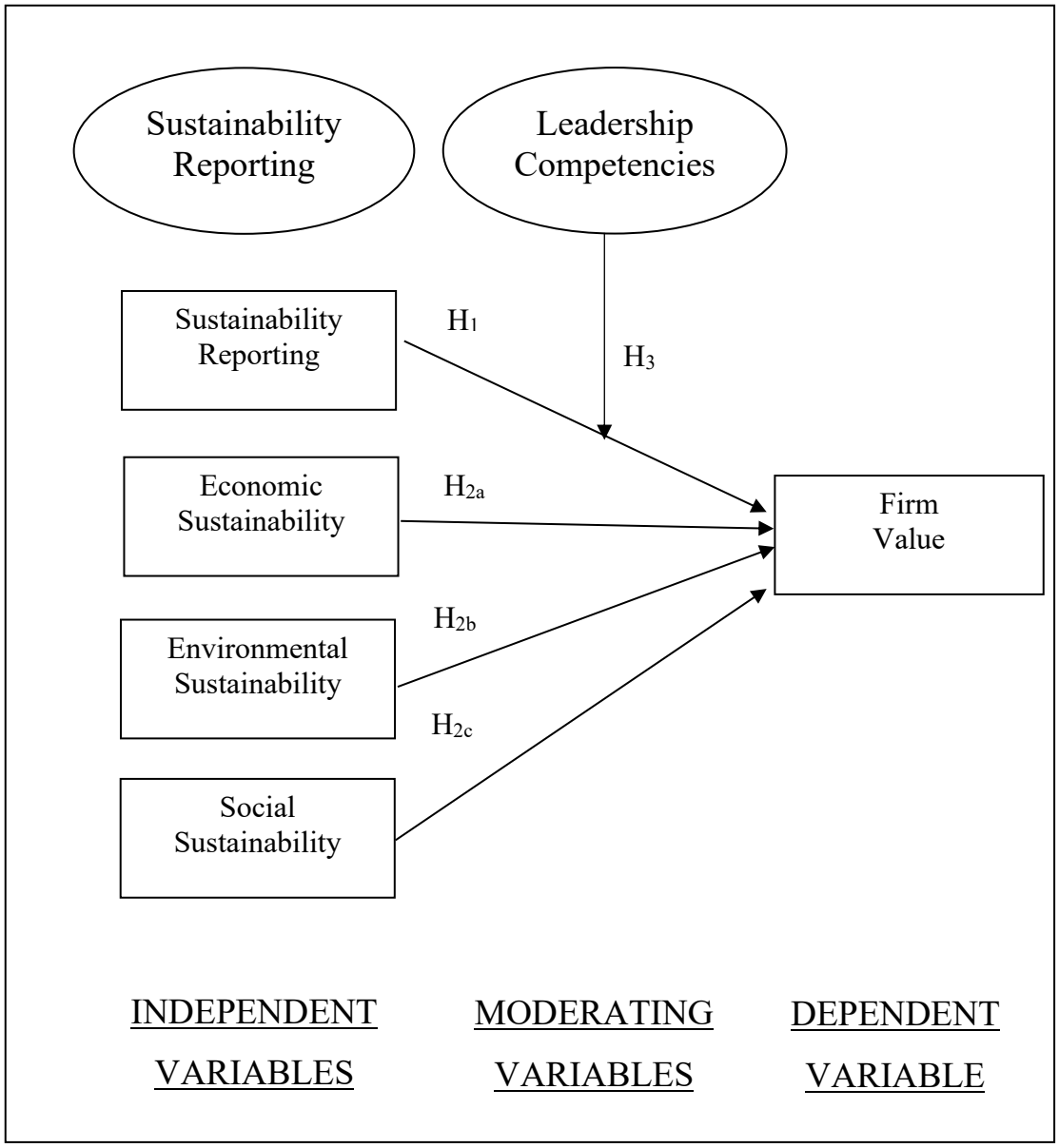

Figure 2.2 Proposed Research Model, Source: (Shah I. A., 2020), Represents the Role of a Moderator

2.12 Integrating Sustainability Reporting into the Ohlson (1995) Equity Valuation Framework

The Ohlson (1995) model provides an accounting-based approach to equity valuation that demonstrates the value relevance of financial statement information. Under the clean surplus accounting principle and assuming efficient markets, Ohlson's framework posits that a firm's market value can be expressed as a function of its book value of equity and earnings, specifically abnormal or residual earnings. In essence, equity value is anchored by the recorded net assets or book value, adjusted for the present value of future earnings more than a normal expected return (Ohlson, 1995).

This theoretical model forms the foundation for understanding how financial fundamentals are reflected in stock prices and why investors consider book value and earnings as reliable predictors of firm value.

Sustainability reporting extends this classical model by introducing non-financial but value-relevant information into the valuation process. Corporate sustainability provides stakeholders with insight into a firm's long term economic, environmental, and social performance, dimensions that are not captured by conventional financial metrics. In this study, sustainability reporting is represented by the total sustainability reporting score (TSRREAL), which encompasses a firm's activities and communication in three principal areas which is economic, environmental, and social sustainability. Environmental sustainability represents its initiatives to minimise ecological impacts through responsible resource management and environmental innovation. Social sustainability relates to employee well-being, community involvement, and the promotion of responsible business conduct.

By integrating TSRREAL and its subcomponents into the Ohlson valuation framework, this study recognises that intangible and non-financial factors contribute to a firm's intrinsic value. Sustainability indicators serve as additional explanatory variables that complement book value and earnings, broadening the understanding of value relevance. A firm that performs well in these sustainability dimensions may benefit from enhanced reputation, improved risk management, and greater operational efficiency, which can be reflected positively in market value. Prior studies (Tarawneh, 2023) provide evidence that level of sustainability reporting increases transparency, reduces uncertainty, and enhances investors' confidence in financial information.

High level sustainability reporting has been found to reduce information asymmetry between firms and investors. By providing comprehensive and transparent information about a company's sustainability performance, firms can foster greater trust and reduce uncertainty in the market (Dhaliwal et al., 2011). This enhanced transparency can improve market liquidity, increase investor confidence, and ultimately lead to a higher valuation (Reverte, 2016). The findings in the literature indicate that sustainability information provides incremental explanatory power beyond traditional financial reporting, supporting its integration within the Ohlson (1995) model.

In addition to the direct inclusion of sustainability variables, this integrated framework considers the influence of leadership competencies as contextual factors. Leadership characteristics such as CEO gender, age, and experience can affect strategic

decision-making, stakeholder relationships, and the communication of sustainability performance. A chief executive's characteristics may influence how sustainability strategies are designed, implemented, and perceived by investors. Empirical studies have shown that firms led by female CEOs tend to display stronger sustainability engagement, while CEOs with extensive experience or higher educational attainment can strengthen the credibility of sustainability initiatives (Tarawneh, 2023). Consequently, leadership competencies are considered a moderating factor that can shape the relationship between sustainability performance and firm value.

In summary, this section integrates the financial foundation of the Ohlson (1995) valuation model with sustainability reporting and leadership competencies to propose an extended equity valuation framework. The model acknowledges that a firm's market value is determined not only by its book value and earnings but also by its level of sustainability reporting and the competencies of its leadership. This integration bridges the conceptual gap between traditional accounting-based valuation and the broader understanding of non-financial value creation. The next chapter will translate this conceptual framework into an empirical research design, detailing the data sources, measurement of variables, and analytical models used to test the extended Ohlson valuation model.

2.13 Chapter Summary

In summary, this chapter focused on the literature review of the past studies conducted by previous researchers in identifying sustainability reporting and firm value with the moderating role of leadership competencies. The discussion of this chapter began with the introduction of the dependent variable which is firm value followed by the explanations of the selected independent variables and moderating variable. This chapter also discussed on the selected theory for this research. As discussed in this chapter, hypothesis of relationship between sustainability reporting, economic sustainability reporting, environmental sustainability reporting and social sustainability reporting were developed. Therefore, the following chapter will present on the research design and the methodology that have been employed for this research.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Chapter Overview

This chapter outlines the research design and methodology employed in the research. This research calculated the mean, standard deviation, and frequency distributions for each variable.

This research also conducted a correlation analysis to examine the bivariate relationships between sustainability reporting, firm value, and leadership competencies. As organisations encounter growing pressures to address sustainability issues, comprehending the relationship between sustainability reporting and firm value is essential. This research determined the significance of the correlations using a two-tailed test at a significance level of $p = 0.05$.

This research performed multiple regression analysis to assess the moderating role of leadership competencies on the relationship between sustainability reporting and firm value. The analysis used archival data from publicly listed companies, concentrating on their sustainability reports and financial information.

This research employs a rigorous methodology to examine the relationship between sustainability reporting, firm value, and leadership competencies. This research tested the regression model for multicollinearity, linearity, and normality of residuals.

3.2 Research Design

This thesis will employ quantitative methods for content analysis, focusing on the annual reports of selected public-listed companies in Malaysia (Krippendorff K. , 2013). This thesis involves data collected through quantitative methods, tailored to the characteristics and types of the data involved.

The preceding chapter examined the existing literature on the theoretical foundations relevant to this research, leading to the formulation of the research hypothesis. The review culminates in identifying the existing gap and the present state of research. The previous chapter also addressed the relationship between the variables.

This chapter outlines the sample selections, data collection methods, and measurement of variables. This is succeeded by the development of hypotheses. This research evaluated the statistical significance of the coefficients, and the overall model fit using the F-test, t-tests, and R-squared value.

The preceding chapter examined the literature on the theoretical foundations relevant to this research, leading to the formulation of the research hypothesis. The review identifies the gap and the present research. The preceding chapter additionally examined the interconnections between the variables. Furthermore, this research assessed the interaction term using hierarchical regression analysis to determine the significance of the moderating effect.

This research utilised Hayes, (2018) process macro for the moderation analysis, which offers a robust framework for analysing moderated relationships.

3.3 Population, Sample Selection and Measurement

3.3.1 Population

In quantitative research, generalizing findings requires a well-defined target population. This study focuses on companies listed on Bursa Malaysia's Main Market as of April 30, 2022. The Main Market comprises established firms meeting stringent financial and regulatory criteria, making them suitable for analysing the relationship between sustainability reporting and firm value (Bursa M. , 2017).

Companies listed on the ACE (Access, Certainty, Efficiency) Market and the LEAP (Leading Entrepreneur Accelerator Platform) Market are excluded from this study. The ACE Market serves as a platform for emerging companies without a profit track record, offering a pathway to the Main Market (Bursa, 2020).The LEAP Market, introduced in 2017, caters to small and medium-sized enterprises (SMEs) seeking access to capital with less stringent regulatory requirements (Bursa M. , 2017). Including firms from these markets could introduce variability due to their different regulatory environments and developmental stages, potentially skewing the analysis. Therefore, focusing solely on Main Market companies ensures a homogeneous sample, enhancing the reliability of the findings.

Additionally, seven finance companies are excluded from the sample. Financial institutions operate under distinct regulatory frameworks and accounting standards,

necessitating separate analyses (Gray, 2013). Their inclusion could complicate comparisons and obscure the relationship between sustainability reporting and firm value in non-financial sectors.

The final sample comprises non-financial companies listed on Bursa Malaysia's Main Market as of April 30, 2022. This selection aligns with the study's objective to assess how sustainability reporting influences firm value within a consistent regulatory and operational context.

The following table lists the number of firms that are listed on Bursa Malaysia's main market.

Table 3.1
Number of Firms That are Listed on Bursa Malaysia's Main Market.

Year	Number of listed firms
2018	801
2019	790
2020	785
2021	782
2022	785

3.3.2 Sample Selection and Sample Size Determination

The function of the sampling method is to collect data from a subset of the population when it is impractical to collect data from the entire population. This research adopts a simple random sampling method to select the sample of companies. Probability sampling ensures that each company in the population has an equal chance of being selected, thereby enhancing the generalizability of the findings. Unlike non-probability sampling, which does not allow for broad generalizations, simple random sampling enables unbiased selection and statistical validity. The sample consists of Main Market-listed companies on the Malaysian stock exchange, including government-linked companies and family businesses across multiple sectors. This approach ensures a representative dataset, strengthening the robustness and credibility

of the research findings. The process of probability sampling can be divided into four stages, as illustrated in Figure 3.1.

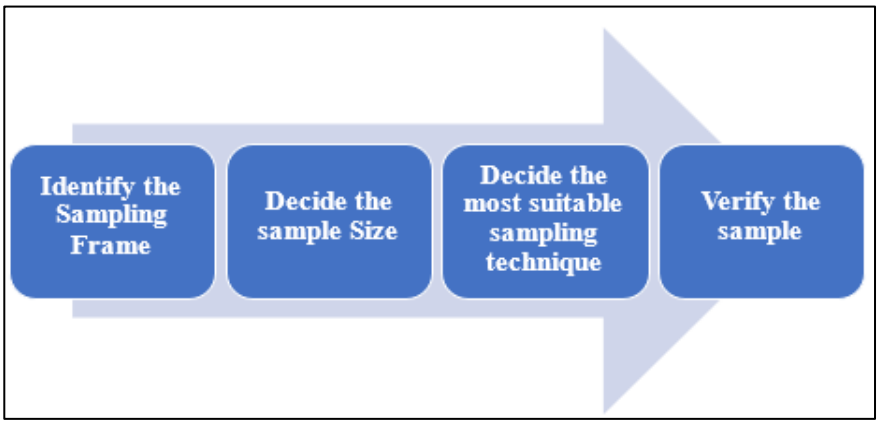

Figure 3.1 The Process of Probability Sampling

To determine an appropriate sample size, this research utilises the Sample Size Table by Krejcie and Morgan (1970), a widely recognised method for deciding sample sizes based on population figures. The population comprises 783 companies listed on Bursa Malaysia's Main Market as of April 30, 2022. According to Krejcie and Morgan's guidelines, a population of this size warrants a sample of approximately 254 to 260 firms to achieve a 95% confidence level with a 5% margin of error. Guided by this recommendation, a final sample of 252 non-financial companies was selected for analysis, aligning with the suggested range and ensuring sufficient statistical power. The sample selection criteria are as follows:

a) Listing tenure which companies must have been listed for at least ten years as of April 30, 2022, to ensure the availability of sufficient historical data.
b) Market Capitalisation. Companies are required to report their market capitalisation at the end of each financial year, providing a consistent basis for firm value measurement; and
c) Sustainability Reporting which companies must disclose information on their social, environmental, and economic sustainability practices, as these reports form the core of the study's independent variables.

By adhering to these criteria and using a systematic sample size determination method, the study enhances the reliability and generalizability of its findings. Table 3.2 presents the sample size determination details based on Krejcie and Morgan's framework.

Specifically, this research aims to understand how sustainability reporting practices impact firm valuation within the Malaysian context.

3.4 Data Collection

This research adopts a simple random sampling method to select the sample of companies. Simple random sampling ensures that each company has an equal chance of being selected, reducing selection bias and enhancing the generalizability of the findings. The sample consists of mainboard-listed companies on the Malaysian stock exchange, encompassing firms from multiple sectors, including government-linked companies and family businesses. This diverse selection provides a comprehensive representation of the Malaysian corporate landscape. By utilizing probability sampling techniques, the study ensures an unbiased and statistically representative dataset, strengthening the validity and reliability of the research findings.

This research primarily relies on secondary data sources to analyse sustainability reporting and leadership competencies among publicly listed firms. As noted by Jalila (2019) and Kasbun (2016), companies disclose sustainability reporting through various platforms, including annual reports, standalone sustainability reports, and corporate websites. The primary dataset consists of publicly available annual reports from listed firms spanning five years (2018–2022). These reports contain financial statements, financial reporting, and sustainability-related information, forming the basis for the content analysis in this research. Bursa Malaysia's Sustainability Reporting Guide (2015) provides recommendations on the types of sustainability reporting required, such as firms' risk management strategies and governance structures concerning economic, environmental, and social.

To extract relevant sustainability data, this study employs content analysis, a well-established qualitative method for systematically examining textual information based on predefined categories and coding rules (Krippendorff, 2018). This technique enables a structured assessment of how firms communicate their sustainability practices, allowing the researcher to identify key themes, reporting patterns, and the degree of alignment with stakeholder expectations (Beattie, 2012).

A binary scoring procedure was adopted to evaluate the presence of sustainability reporting. Each firm received a score of one (1) if relevant sustainability information was reported and zero (0) if it was not. The checklist used for coding was

adapted from the Global Reporting Initiative (GRI) G3.1 framework, encompassing key dimensions such as environmental performance, labour practices, governance, and community engagement (Hahn, 2013). This scoring approach is consistent with prior studies such as Kasbun et al. (2016), who applied a similar binary scale to assess sustainability reporting among Malaysian public-listed companies. For firms without standalone sustainability reports, their annual reports were reviewed to identify embedded sustainability reporting, following the approach of Michelon (2012).

A score of 1 was assigned only when the reporting was specific, clearly stated, and corresponded with one or more GRI categories. Ambiguous or general statements were scored 0. Each reported item was independently assessed for its presence or absence, ensuring consistency and replicability across a large dataset. The binary scoring system is particularly advantageous for enabling comparability across firms and time periods, especially in large-scale studies (Haniffa, 2005), (Guthrie, 2006).

While the binary scoring method may not fully capture the depth or qualitative richness of sustainability narratives, it remains a robust and objective tool for assessing reporting levels (Hahn, 2013). Its simplicity enhances reliability, reduces coder subjectivity, and ensures consistency across firms and reporting periods (Milne, 1999). Moreover, the binary system effectively supports the objectives of this study: identifying the level of sustainability reporting (RO1), examining its relationship with firm value (RO2), and exploring moderating effects such as leadership competencies (RO4). As demonstrated in prior empirical research, binary measurement provides a practical, valid, and comparable approach for evaluating the existence and integration of sustainability practices (Michelon, CSR reporting practices and the quality of disclosure: An empirical analysis, 2015)

For the moderating variable, leadership competencies, secondary data was extracted from firms' annual reports. Key leadership characteristics, such as academic background, years of experience, and leadership traits of top executives and decision-makers, were sourced from the organisational profile sections of these reports. Additionally, qualitative statements regarding corporate sustainability strategies and commitments were reviewed (GRI, 2021). Dewar, (2019) emphasises that CEO leadership competencies are shaped by a combination of factors, including qualifications, experience, tenure, age, and gender, all of which influence decision-making and corporate sustainability performance.

In addition to corporate reports, this research incorporates external sustainability and corporate responsibility documents, such as Bursa Malaysia's Sustainability Report 2020 (Bursa M., 2020), CSR reports, Corporate Responsibility (CR) reports, and Social and Environmental (SE) reports (Loh, 2017).

This study utilised SPSS as the primary statistical software to analyse a panel dataset comprising 252 firms over a five-year period. SPSS was employed for data management, descriptive analysis, and panel regression estimation due to its suitability and widespread acceptance in social science research. Regression analysis was also conducted using Microfit solely as a robustness check, and the results obtained were consistent with those generated by SPSS. In addition, Microfit was used specifically to test for autocorrelation as part of the regression diagnostic process. However, Microfit was not applied for panel data estimation because it is designed primarily for time-series analysis.

By leveraging multiple reliable and publicly available sources, this research ensures a comprehensive, well-rounded analysis of sustainability reporting and leadership competencies in Malaysian publicly listed firms.

3.5 Measurement of Variables

Table 3.3 presents the operationalisation of the three variables that is independent, dependent, and control. Sustainability reporting is operationalised through the GRI G3.1 indicators, which represent the three key dimensions of sustainability: economic, environmental, and social.

Economic sustainability is represented by indicators EC1, EC2, EC3, and EC4, focusing on compliance with national regulations, equitable treatment of stakeholders, and responsible economic practices.

Environmental sustainability is measured through indicators EN1, EN2, EN3, and EN4, which assess the organisation’s resource use, energy efficiency, and broader environmental impact.

Social sustainability is captured through indicators SO1, SO2, SO3, and SO4, which relate to human rights, labour practices, and community engagement.

These indicators collectively provide a balanced representation of sustainability performance as recommended under the GRI G3.1 framework. While Malaysia’s sustainability reporting framework shows some variation in application, the use of these

internationally recognised indicators ensures comparability and reliability across firms and time.

This study investigates the relationship between sustainability reporting and firm value within the Ohlson (1995) equity valuation framework, with leadership competencies variables serving as moderators. The variables are grouped into three main categories: dependent, independent, and moderating variables, with control variables included to enhance model robustness and address omitted variable bias.

3.5.1 The Dependent Variable: Firm Value

In this study, firm value is proxied by market capitalisation (MCAP), a commonly adopted measure in prior empirical research (Nurlela, 2008). Market capitalisation represents the market's valuation of a firm based on its equity value and reflects investors' collective assessment of the firm's performance and future growth prospects (Brealey, 2020). Higher levels of market capitalisation indicate stronger investor confidence and, consequently, higher firm value.

Consistent with the Ohlson (1995) valuation model, book value of equity (BV) and earnings (NI) are incorporated as explanatory variables that account for variations in firm value. The Ohlson framework conceptualises firm value as a function of fundamental accounting information, particularly book value and earnings, which capture a firm's financial position and profitability. Accordingly, this study adopts BV and NI as key financial determinants of market capitalisation.

To extend the traditional Ohlson framework, this study incorporates total sustainability reporting (TSRREAL) as an additional explanatory variable. This extension is aligned with prior studies that integrate non-financial information into valuation models to assess whether sustainability-related disclosures provide incremental explanatory power in determining firm value beyond conventional accounting measures.

Firm value (MCAP) is operationalised using year-end market capitalisation, calculated as the firm's share price multiplied by the number of outstanding shares. This operationalisation is consistent with valuation-based studies on Malaysian public-listed companies and ensures comparability with existing empirical findings. Following Ohlson (1995), the extended valuation model is expressed as:

$$MCAP_{it}=\alpha+\beta_1 BV_{it}+ \beta_2 NI_{it}+ \beta_3 TSRREAL_{it}+\varepsilon_{it} \quad (3.1)$$

where:
MCAP is market capitalization of firm i at time t,
BV is book value of equity of firm i at time t (independent variable),
NI is net income of firm i at time t, (independent variable)
TSRREAL is total sustainability reporting score for firm i at time t
α is constant
ε is error term

This model captures the relationship between accounting-based measures and sustainability reporting in determining firm value. The combination of BV and NI, as suggested by Ohlson (1995), provides the financial foundation of firm valuation, while TSRREAL extends the model to include non-financial reporting effects. Therefore, market capitalisation functions as the dependent variable, and BV, NI, and TSRREAL are independent variables used to explain variations in firm value. This model establishes the value relevance of financial statement information after extending the model to include sustainability and leadership factors.

3.5.2 The Independent Variables

Sustainability reporting in this research is assessed using a score derived from the Global Reporting Initiatives (GRI) Standards. This coding and content analysis framework allows for an in-depth examination of the extent to which firms listed on Bursa Malaysia engage in corporate sustainability reporting (SR). The GRI Standards serve as the latest global benchmark for sustainability reporting, enabling organizations to disclose economic, environmental, and social impacts in a standardized and comparable manner (GRI, 2021).Based on previous research, this research thinks that the book value of common equity ($BV_{i,t}$) and earnings ($EARN_{i,t}$) will be positively related to the value of the firm. It also thinks that the coefficient of the cross-term with the dummy variable $NEG_{i,t}$ will be negative, since a deficit is thought to have a negative effect on the stock not being able to be sustained (Loh, 2017)

Furthermore, there should be a positive relationship between the firm value and the sustainability reporting dummy variable, SR_i. Sustainability reporting assesses the overall reporting of sustainability practices, policies, and performance indicators. It reflects the transparency and accountability of firms in communicating their sustainability initiatives to stakeholders (KPMG, 2020).

Economic sustainability measures the financial aspects of sustainability, including contributions to economic development, cost efficiency, and responsible financial management. It reflects the firm's ability to create long-term economic value while addressing risks and opportunities associated with (Eccles, 2012).

Environmental sustainability captures the firm's impact on natural resources, including efforts to reduce carbon emissions, energy consumption, water usage, and waste generation. It evaluates the firm's compliance with environmental regulations and adoption of green practices (Porter, 2006).

Social sustainability examines the firm's contributions to societal well-being, including employee welfare, community engagement, and adherence to ethical labour practices. It highlights the firm's commitment to addressing social equity and promoting positive stakeholder relationships (Carrot, 2016)

By analysing these dimensions, the research aims to evaluate the extent of sustainability reporting and its impact on firm value. The inclusion of economic, environmental, and social sustainability ensures a holistic approach to understanding the independent variables' influence on the dependent variable. Additionally, the use of content analysis provides valuable insights into the quality and comprehensiveness of sustainability reporting across different firms.

The independent variables represent sustainability reporting performance, operationalized through the GRI G3.1 indicators. These variables reflect the three key sustainability dimensions:

Where:

TSRREAL = Total sustainability reporting score (aggregate score),

ECREAL = Economic sustainability reporting score,

ENREAL = Environmental sustainability reporting score,

SOCREAL = Social sustainability reporting score.

Each score is constructed through content analysis of annual and sustainability reports, scored based on the extent and quality of reporting aligned with GRI G3.1

indicators. The scoring captures the comprehensiveness and transparency of sustainability communication for each firm and year.

3.5.2.1 The Measurement of Sustainability Reporting

In quantitative research, determining an appropriate sample size is crucial to ensure the validity and generalizability of findings. This thesis employs the Sample Size Table developed by Krejcie and Morgan (1970), a widely recognised method for determining sample sizes based on population figures. Despite its age, this table remains relevant and is frequently utilised in contemporary research across various disciplines. For instance, Memon et al. (2020) discuss its application in modern survey research, highlighting its continued relevance in determining sample sizes for categorical data. Similarly, Kenpro (2012) emphasises the table's utility in providing a straightforward reference for researchers to ascertain appropriate sample sizes without complex calculations.

In this research, the population comprises 783 companies listed on the Main Market of Bursa Malaysia as of April 30, 2022. Referring to Krejcie and Morgan's table, the recommended sample size for a population of this magnitude ranges between 254 and 260. This range ensures a confidence level of 95% and a margin of error of 5%, aligning with standard research practices. The sample selection criteria are as follows:

a. Listing Tenure: Companies must have been listed for at least ten years as of April 30, 2022, ensuring the availability of sufficient historical data for analysis.
b. Market Capitalisation: At the end of each annual accounting period, companies are required to calculate and report their annual market capitalisation, providing a consistent financial metric for evaluation.
c. Sustainability Practices Reporting: Companies must disclose their sustainability practices, encompassing social, environmental, and economic aspects, to assess the comprehensiveness and quality of their sustainability reporting.

By adhering to these criteria and utilising the established sample size determination methods, this research aims to provide robust and generalizable insights into the relationship between sustainability reporting and firm value, moderated by

leadership competencies, within the Malaysian context. Table 3.2 present the determination of sample size.

Table 3.2
Determining of Sample Size

Population	Sample(S)	Population	Sample(S)
700	248	850	265
750	254	900	269
800	260	950	274

This study utilises content analysis to investigate sustainability reporting in the annual report (Liao, 2020).Content analysis is a study methodology utilised to analyse quantitative data, such as text or photographs, in order to identify patterns, themes, and meanings (Krippendorff, 2018). It involves a systematic examination of the content of a communication, such as a document, speech, or image, to derive information relevant to addressing research queries.

Content analysis of sustainability reporting demonstrates how companies communicate their sustainability performance to stakeholders, clarifying the relationship between sustainability reporting and firm value.

The content analysis method is utilised to obtain sustainability data from the sample. This method extracts specific information from the text and evaluates it based on defined criteria. Furthermore, in the domain of sustainability reporting, content analysis enables academics to examine the reporting and reporting practices of companies, providing insights into their performance in economic, environmental, and social dimensions (Tolentino, 2019).

This study measures sustainability reporting using the Global Reporting Initiative (GRI) Guidelines, specifically the GRI G3.1 version. The GRI G3.1, introduced in 2011, provides a structured set of performance indicators that guide organisations in reporting their economic, environmental, and social sustainability practices. These indicators were selected because they are widely recognised in academic research and were actively adopted by Malaysian listed companies during the study period.

Although the GRI Standards 2021 represent the most recent update to the GRI framework, this study employs GRI G3.1 for two main reasons. First, the data used in this research correspond to years in which most Malaysian firms continued to prepare their sustainability reports based on the G3.1 framework. Using the same version ensures that the data accurately reflect the sustainability reporting practices of the time. Second, the core indicators and dimensions in G3.1 remain conceptually consistent with those in the GRI Standards 2021, allowing for meaningful comparison without compromising methodological validity.

In essence, the use of GRI G3.1 is justified by both historical relevance and data consistency, while still maintaining alignment with the evolution of GRI principles. The structure of G3.1 also allows the analysis to integrate effectively with previous empirical studies that adopted similar measures, thereby supporting longitudinal and comparative evaluation of sustainability reporting practices.

According to Kasbun (2016), this research outlines how the two variables, namely the independent and dependent variables, are operationalised in Table 3.3. In line with GRI 3.1, standard sustainability reporting and performance indicators are used to represent sustainability categories.

Table 3.3
Variable Operationalisation

Variable	Measurement and Operationalisation	Reference
Independent Variables:		
Economic Sustainability Reporting	Measurement method: Binary content analysis. Score "1" if the GRI indicator is reported in the annual or sustainability report; "0" if not reported. EC1: Distribution of revenues, employee compensation and benefits, investments made for employees.	GRI G3.1 Standard Reporting: Performance Indicators (Roxas, 2012), (Siddiqui, 2013),(AICPA 2013), (Bowers, 2010).) (Herath, 2005), Quin (2009), (Fung, 2007), GRI G3.1

Variable	Measurement and Operationalisation	Reference
	EC2: Compensation for environmental damage (e.g., climate change, erosion, contamination). EC3: Spending on local suppliers and hiring local communities. EC4: Infrastructure investments and services for public benefit.	
Environmental Sustainability Reporting	Measurement method: Binary content analysis. Score "1" if the GRI indicator is reported in the annual or sustainability report; "0" if not reported EN1: Direct materials and raw materials used (energy, fossil fuels, electricity). EN2: Water used in business activities (e.g., for cooling, machinery, staff). EN3: Air emissions, wastewater discharge, and other environmental impacts. EN4: Environmental compliance costs, penalties, or fines.	(Dangelico, 2010), (Moneva, 2009), (Porter, 2006), (Villiers, 2012)(Roxas B. &., 2012) , (Theyel, 2012), (Sumiani, 2006), GRI G3.1
Social Sustainability Reporting	Measurement method: Binary content analysis. Score "1" if the GRI indicator is reported in the annual or sustainability report; "0" if not reported. SO1: Equal opportunity and	(Galinsky, 2008); (Barron, 2002); (Mather, 2011); (Kasbun, 2016), GRI G3.1; Herath (2005)

Variable	Measurement and Operationalisation	Reference
	diversity in hiring and promotion. SO2: Employee training, career development, and health and safety. SO3: Community engagement, philanthropy, and stakeholder relations. SO4: Freedom of association, collective bargaining, and human rights protection.	
Dependent Variables Market Capitalisation	The total market value of a company's outstanding shares (Market Capitalisation = Share Price × Total Outstanding Shares).	(Kasbun, 2016), (KPMG, 2020)
Control Variables		
Earnings Per Share (EPS)	Calculated as EPS = (Net Income – Dividends on Preferred Stock) / Average Outstanding Shares.	(Bursa, 2018), (Kasbun, 2016),
Leverage	Measured as the ratio of total liabilities to total assets.	(Kasbun, 2016), (Loh, 2017)
LOG Total Asset (LOGTA)	Natural logarithm of total assets to account for scale effects.	(Kasbun, 2016), (Bursa, 2020)
Moderator Leadership Competencies		
Total number of board directors	If a company has 6 directors, the score of TBOARD =6	(Abdul, 2006)

Variable	Measurement and Operationalisation	Reference
TBOARD		
CEO gender. CEOGEN	Scored as 1 = Male, 2 = Female.	(Said et al., 2009)
Total number of women on the firm's board TWMN	Recorded as the actual count of female directors disclosed in the company's annual report.	(Zainal et al., 2013)
CEO's level of qualification CEOQual	1 = SPM and below, 2 = Diploma, 3 = Degree, 4 = Master, 5 = PhD.	(Ibrahim, 2016)
Number of years the individual has served as CEO. CEOYRS	Measured as a continuous variable (in years) based on information from the annual report or company website.	(Wahab et al., 2015)
Number of years of relevant professional or managerial experience held by the CEO prior to current appointment. WRKEXP	Recorded as a continuous variable (in years).	(Ismail, 2011)
Age of the CEO at the time of data collection CEOAGE	Recorded in years.	(Sulong, 2010)
CEO tenure in the current position CEOTEN	measured as the number of years since appointment as CEO.	(Abdullah, 2004)
CEO's field of academic specialization.	Scored as 0 = Qualification other than management, accounting, or finance; 1 =	(Kasbun, 2016)

Variable	Measurement and Operationalisation	Reference
EDUSPEC	Qualification in management, accounting, or finance.	
CEO Nationality NATION	The nationality of the chief executive officer. This variable captures differences in cultural exposure and institutional background that may influence sustainability reporting practices. The variable is measured as a binary variable, where 0 = Foreign CEO and 1 = Malaysian CEO.	(Amran et al., 2014)

3.5.3 The Moderating Variables of Leadership Competencies

Leadership competencies in this study refer to the personal qualities, professional background, and decision-making experience of top executives that influence how sustainability initiatives are implemented and communicated within an organization. From a stakeholder theory perspective, leadership competencies guide executives in balancing and responding to the expectations of multiple stakeholder groups through transparent sustainability practices. Stewardship theory further suggests that competent leaders act as responsible stewards who prioritise long-term organizational value and accountability rather than short-term self-interest. In line with the triple bottom line framework, leadership competencies support the integration of economic, environmental, and social considerations into strategic decision-making, thereby shaping sustainability reporting practices and organizational outcomes (Freeman et al., 2020)

Given the important role of leadership in driving sustainability practices, this study examines nine dimensions of leadership competencies that may moderate the relationship between sustainability reporting and firm value. These dimensions are consistent with prior research and contextualized for Malaysian public-listed companies, as summarized in Table 3.4. Each variable represents a specific aspect of

leadership that may either strengthen or weaken the impact of sustainability reporting on firm value, depending on how it affects managerial judgment and strategic emphasis.

Leadership competencies characteristics are introduced as moderating variables that may strengthen or weaken the relationship between sustainability reporting and firm value. These characteristics reflect observable attributes of top leadership, including CEO gender, board gender representation, educational qualifications, academic specialisation, age, tenure, professional experience, and nationality. Such attributes influence how sustainability reporting is prioritised, interpreted, and communicated by senior leadership, which in turn affects the credibility and perceived relevance of sustainability disclosures to investors. Differences in education level, professional experience, and tenure may shape a leader's ability to understand and utilise sustainability information, while demographic factors such as gender and nationality may influence attitudes toward transparency and disclosure practices. Consequently, sustainability reporting is more likely to translate into higher firm value when leadership competencies enhance the clarity and consistency of sustainability disclosures, whereas weaker leadership attributes may limit the effectiveness of sustainability reporting in influencing market valuation (Donaldson, 2020).

In this study, the moderating variables representing leadership competencies were coded using a structured content analysis and scoring method. Information on each variable was extracted from company annual reports and verified with official corporate sustainability reporting. A binary and categorical scoring approach was applied to ensure consistency across the sample. For instance, the variable NATION was coded as 0 if the CEO was a foreigner and 1 if the CEO was Malaysian. Similarly, TWMN was scored based on the total number of women on the board as disclosed in the company profile, while continuous measures such as CEOYRS, WRKEXP, CEOAGE, and CEOTEN were recorded in years as stated in the directors' background section. This scoring process allowed for an objective and replicable assessment of leadership competencies related characteristics that may moderate the link between sustainability reporting and firm value. This systematic approach ensured that all moderating variables were coded in a transparent and replicable manner for statistical analysis. The variables identified to represent leadership competencies, which serve as moderators in this study, are summarized in Table 3.3.

Leadership competencies in this study are captured through various CEO and board characteristics that may influence how sustainability reporting affects firm value.

These characteristics represent demographic, experiential, and cognitive factors that shape strategic decisions and organizational behaviour. The following subsections describe each moderating variable and its expected impact, supported by relevant literature. The description of moderating variables is presented as follows.

Total Board Members (TBOARD) reflects the size of the board and its capacity to provide effective oversight. A larger board may offer broader expertise, diverse perspectives, and stronger monitoring of sustainability related activities. Such diversity of views can enhance the credibility and comprehensiveness of sustainability reporting, thereby strengthening its influence on firm value. However, excessively large boards may face coordination challenges, which could reduce their effectiveness. (García, 2020)

CEO Gender (CEOGEN) may influence corporate priorities and ethical awareness. Female chief executive officers are often associated with more inclusive leadership styles and stronger stakeholder engagement. Their leadership approach tends to emphasise transparency, sustainability, and social accountability, which can enhance the level of sustainability reporting and improve stakeholder trust. Consequently, the presence of a female CEO is expected to strengthen the relationship between sustainability reporting and firm value (Liu, 2021).

Total Number of Women on the Board (TWMN) represents board gender diversity, which contributes to more balanced oversight and broader perspectives in decision making. Greater female representation on boards is often linked to enhanced ethical accountability and stronger attention to sustainability related matters. This diversity can improve the credibility of sustainability reporting and increase stakeholder confidence, thereby strengthening its impact on firm value (García, 2020).

CEO Qualification (CEOQual) captures the educational attainment of the chief executive officer. Higher academic qualifications indicate a stronger capacity to understand complex sustainability issues and integrate them into organisational practices. CEOs with higher qualifications are more likely to appreciate the strategic importance of sustainability reporting, which can enhance its effectiveness in influencing firm value (García, 2021)

CEO Years of Service (CEOYRS) provides insight into the extent of a CEO's familiarity with firm operations and stakeholder relationships. Moderate years of service may enable CEOs to effectively implement sustainability initiatives due to accumulated knowledge and influence. However, excessively long service may lead to

rigidity or reduced responsiveness to emerging sustainability challenges, potentially weakening the effectiveness of sustainability reporting (Liu, 2022).

CEO Work Experience (WRKEXP) reflects managerial competence and strategic maturity. CEOs with extensive professional experience are generally better equipped to align sustainability initiatives with business objectives. Their understanding of industry practices and stakeholder expectations supports more effective implementation of sustainability reporting, which can enhance firm value (Hernández, 2018).

CEO Age (CEOAGE) may influence leadership style and risk preferences. Younger CEOs are often more open to innovation and proactive in adopting sustainability-oriented strategies, while older CEOs may place greater emphasis on stability and short-term financial outcomes. As a result, younger CEOs are expected to strengthen the relationship between sustainability reporting and firm value, whereas older CEOs may weaken it if long term sustainability considerations receive less emphasis (Serfling, 2014)

CEO Tenure (CEOTEN) represents the length of time a CEO has held the current position. Moderate tenure may support effective sustainability reporting by combining experience with adaptability. In contrast, excessively long tenure may reduce openness to new sustainability practices, thereby weakening the influence of sustainability reporting on firm value (Liu, 2022).

Educational Specialisation (EDUSPEC) indicates whether the CEO possesses an academic background relevant to management, accounting, or finance. Relevant and higher specialisation enhances a CEO's ability to interpret sustainability information and integrate it into organisational practices. As a result, CEOs with relevant educational specialisation are expected to strengthen the relationship between sustainability reporting and firm value (García, 2021).

CEO Nationality (NATION) reflects differences in cultural exposure and familiarity with sustainability standards. Foreign CEOs may introduce international perspectives and global best practices that enhance the quality and credibility of sustainability reporting. Local CEOs may possess stronger knowledge of domestic regulations and business contexts, although their impact on sustainability reporting effectiveness may depend on the regulatory and institutional environment. Therefore, the moderating effect of CEO nationality is expected to vary according to contextual factors.

Leadership competencies are conceptualised in this study as key CEO and board characteristics that may condition how sustainability reporting influences firm value. Prior literature suggests that demographic, educational, and experiential characteristics. Accordingly, this study incorporates a set of CEO and board related variables as moderating factors. Table 3.4 summarises the expected direction of influence for each leadership competency variable, based on theoretical arguments and empirical evidence from prior studies.

Table 3.4

Summary of the Expected Direction of Influence for Each Leadership Competencies on the Sustainability Reporting and Firm Value Relationship

Bil		Variable	Expected Influence on Sustainability Reporting and Firm Value Relationship	Direction
1.		TBOARD	Number of Board Members	Mixed García (2020)
2.		CEOGEN	Female CEOs likely improve stakeholder trust and transparency	Strengthen Liu (2021)
3.		TWMN	Greater board gender diversity enhances credibility of reporting	Strengthen García (2020)
4.		CEOQual	Higher qualification improves sustainability integration	Strengthen García (2021)
5.		CEOYRS	Moderate service strengthens; excessive service weakens	Mixed Liu (2022)
6.		WRKEXP	More experience supports effective sustainability implementation	Strengthen Hernández (2018)
7.		CEOAGE	Younger CEOs strengthen; older CEOs may weaken	Mixed Serfling (2014)

8.		CEOTEN	Moderate tenure strengthens; excessive tenure weakens	Mixed Liu (2022)
9.		EDUSPEC	Relevant and higher specialization improves sustainability understanding	Strengthen Hernández (2018)
10.		NATION	Foreign CEOs may strengthen; local CEOs' effect depends on context	Mixed Liu (2022)

3.6 Theoretical Rationale for Moderating Variables

This study explains the moderating role of leadership characteristics using Stewardship Theory, Stakeholder Theory, and the Triple Bottom Line framework. These theories collectively provide a coherent foundation for understanding how leadership attributes condition the relationship between sustainability reporting and firm value.

From the perspective of Stewardship Theory, corporate leaders are viewed as stewards who act in the long-term interests of the organisation by aligning managerial actions with organisational goals (Hernandez, 2018). Leadership characteristics therefore influence how effectively sustainability initiatives are implemented and sustained over time. Attributes such as board structure, leadership experience, education, and tenure reflect the capacity of leaders to act responsibly, exercise sound judgement, and ensure that sustainability reporting supports long-term value creation (Garcia, 2020)

In line with Stakeholder Theory, firms are expected to balance the interests of multiple stakeholder groups, including shareholders, employees, customers, regulators, and society. Leadership characteristics shape how stakeholder expectations are recognised and addressed through sustainability disclosures. Board related variables such as TBOARD and TWMN capture governance structure and gender diversity, which influence oversight quality and ethical sensitivity. Boards with an appropriate size and greater female representation are more likely to provide diverse perspectives and stronger monitoring, thereby enhancing the credibility and stakeholder relevance of sustainability reporting. This strengthened governance context may increase the effectiveness of sustainability reporting in improving firm value (Freeman et al., 2020).

CEO gender (CEOGEN) further reflects leadership orientation toward stakeholders. Female CEOs are often associated with leadership styles that emphasise transparency, accountability, and social responsibility. Such characteristics are consistent with stakeholder-oriented governance and may strengthen the relationship between sustainability reporting and firm value by enhancing trust in corporate disclosures (Liu, 2021)

Educational attributes, represented by CEOQual and EDUSPEC, are closely aligned with both Stewardship Theory and the Triple Bottom Line framework. Higher educational attainment and relevant academic specialisation in areas such as management, accounting, or finance enhance a leader's ability to understand sustainability information across economic, environmental, and social dimensions. Leaders with appropriate qualifications are better positioned to integrate sustainability reporting into organisational practices and communicate its value relevance to stakeholders and investors (García, Assurance of sustainability reports and the role of board characteristics, 2020)

Experience related characteristics, including CEOYRS, WRKEXP, and CEOTEN, reflect the depth of managerial exposure and organisational familiarity. From a stewardship perspective, moderate experience and tenure may support stability, accountability, and effective implementation of sustainability initiatives. However, excessive years of service or tenure may reduce adaptability and responsiveness to emerging sustainability challenges. Accordingly, these variables are expected to exert a mixed moderating effect on the relationship between sustainability reporting and firm value (Liu, 2022)

Finally, CEO nationality (NATION) reflects differences in cultural exposure and institutional background. Foreign CEOs may bring international perspectives and familiarity with global sustainability standards, supporting stronger alignment with Triple Bottom Line principles. Local CEOs may possess deeper understanding of domestic regulations and business environments, which can also support sustainability practices depending on contextual factors. These differences are expected to influence how effectively sustainability reporting translates into firm value within the Malaysian corporate context (Amran, Leadership, sustainability reporting and firm value: Evidence from emerging markets., 2022)

Overall, grounded in Stewardship Theory, Stakeholder Theory, and the Triple Bottom Line framework, this study posits that leadership characteristics condition the

effectiveness of sustainability reporting. Leadership competencies attributes shape the credibility, interpretation, and implementation of sustainability reporting, thereby moderating their impact on firm value.

3.7 Control Variable

Control variables are incorporated in this study to account for firm-specific characteristics that may influence market value. The inclusion of these variables helps to reduce omitted variable bias and improves the accuracy and reliability of the regression estimates (Elsheikh, 2024). In accordance with previous applications of the Ohlson (1995) valuation framework, firm-level control factors are added to ensure that the relationship between sustainability reporting and firm value is correctly estimated.

Three control variables are used in this study, namely earnings per share (EPS), leverage (LEV), and firm size (LOGTA). Earnings per share represents the profitability of the firm and reflects its operational efficiency, which can independently affect market valuation. It is calculated by dividing the net income attributable to shareholders by the weighted average number of outstanding shares. Prior studies indicate that firms with higher profitability are more likely to participate in sustainability reporting and demonstrate stronger financial performance (Pasupuleti, 2023).

Leverage is measured as the ratio of total liabilities to total assets and represents the financial structure and risk profile of a firm. Firms with high leverage may experience financial constraints that restrict their capacity to invest in or disclose sustainability-related activities. At the same time, leverage can influence investor perceptions of firm stability, which may affect valuation regardless of sustainability performance (Elsheikh, 2024).

Firm size (LOGTA) and serves as an important determinant of reporting behaviour and firm value. Larger firms often have greater visibility, stronger stakeholder pressure, and more resources to engage in extensive sustainability practices (Mahenthiran, 2023). Firm size (LOGTA) is also associated with market confidence and investment stability, which frequently translate into higher valuation levels (Krieger, 2024).

The inclusion of these control variables, namely earnings per share, leverage, and firm size (LOGTA), within the extended Ohlson model ensures that variations in firm value are correctly attributed to sustainability reporting alone. By controlling for

profitability, leverage, and firm size, the study provides a more accurate and reliable evaluation of how level of sustainability reporting influence firm value in the Malaysian context.

3.8 Statistical Modelling, Diagnostic Test and Data Analysis Techniques

This study employs a structured statistical modelling strategy to examine the relationship between sustainability reporting and firm value, with leadership competency acting as a moderating variable. The modelling approach is grounded in valuation based empirical research, where firm value is explained using both accounting information and additional information disclosed by firms. Regression analysis is widely used in such contexts to analyse multivariate relationships in which a dependent variable is influenced by multiple explanatory variables while holding other factors constant (Mudholkar, 2016).

In this research, ordinary least squares regression serves as the primary estimation technique due to its suitability for examining linear relationships between sustainability reporting, leadership competencies, and firm value. Regression analysis enables the assessment of how changes in sustainability reporting disclosures influence market capitalisation, while controlling for other firm specific characteristics (Michael, 2008). The method is well established in applied economics, finance, and social science research and is widely supported by standard statistical software packages (Agresti, 2007).

To ensure methodological rigour, this study utilises SPSS and Microfit version 5.5, each serving a complementary analytical role. SPSS is used primarily for cross sectional analysis, including descriptive statistics, correlation analysis, and baseline regression estimation. Microfit is employed for econometric analysis involving time series and panel data, allowing for the examination of both short run and long run relationships. The combined use of these tools ensures consistency between theoretical valuation models and empirical implementation.

The analysis begins with descriptive statistics to provide an overview of all variables, including sustainability reporting dimensions, firm value, leadership competency measures, and control variables. These statistics summarise central tendencies and dispersion, ensuring the suitability of the data for regression analysis. Correlation analysis is then conducted to examine bivariate relationships among sustainability reporting, firm value, and leadership competency. Pearson's correlation

coefficient is used to assess the strength and direction of these relationships, with statistical significance evaluated using a two tailed test at the five per cent level.

Following the preliminary analysis, the study applies multiple regression analysis based on the Ohlson (1995) valuation framework, where firm value is proxied by market capitalisation. Within this framework, sustainability reporting is treated as relevant non-financial information that complements traditional accounting variables such as book value and net income by influencing investors' expectations regarding long term performance, risk, and governance quality. Sustainability reporting variables, namely total sustainability reporting and its economic, environmental, and social dimensions, are incorporated into the valuation models to assess their additional explanatory power beyond accounting fundamentals.

To examine the moderating role of leadership competency, interaction terms between sustainability reporting variables and leadership attributes are introduced into the regression models. These interaction terms test whether the effect of sustainability reporting on firm value varies according to leadership characteristics such as chief executive officer gender, qualifications, experience, tenure, and board composition. The moderation framework reflects the premise that leadership competency influences how sustainability initiatives are designed, implemented, and communicated, thereby conditioning their effectiveness in enhancing firm value.

The regression models are estimated in a staged sequence to ensure clarity and theoretical consistency. The first stage estimates the baseline Ohlson valuation model using accounting variables only. The second stage introduces sustainability reporting variables to assess their direct effect on firm value. The third stage incorporates leadership competency variables together with interaction terms to test the moderating effects. This staged approach allows for a systematic evaluation of how sustainability reporting and leadership competency jointly influence firm value.

To ensure the validity of the ordinary least squares estimates, several diagnostic tests are conducted. Multicollinearity is assessed using variance inflation factors to confirm that explanatory variables are not excessively correlated. Tests for heteroscedasticity are performed to verify the assumption of constant error variance, while residual normality and linearity are examined to confirm model adequacy. These diagnostic procedures ensure that the regression results are reliable and statistically sound.

The statistical significance of individual coefficients is evaluated using t-tests, while overall model fit is assessed using F-tests and the coefficient of determination. Moderation effects are further examined using hierarchical regression analysis, which allows for the incremental assessment of interaction terms. In addition, the study employs the process macro developed by Hayes (2018) to provide a structured approach to analysing moderated relationships.

Overall, this statistical modelling strategy ensures a clear alignment between theory, operationalisation, and empirical testing. By integrating sustainability reporting into a valuation-based framework and explicitly modelling leadership competencies as a moderator, the analysis provides a coherent and rigorous examination of how sustainability reporting translates into firm value within the Malaysian context.

3.9 Statistical Models

This research employs SPSS as the primary statistical software for data analysis and descriptive examination of all variables, while Microfit version 5.5 is used only in a limited capacity for regression robustness checking and autocorrelation testing.

To ensure an appropriate sample size, it utilises the Sample Size Table developed by Krejcie (1970), a widely recognised tool among researchers, as shown in Table 3.2. Additionally, content analysis, as described by Krippendorff (2018), serves as the research methodology to examine quantitative data, such as text or images, to uncover patterns, themes, and meanings.

Many studies continue to demonstrate the accuracy of Ohlson's (1995) equity model (Kadri et al., 2023). With the research regarding examining the value relevance of biological assets and their fair value change in Malaysia, use the Ohlson (1995) model and a modified version of it throughout the entirety of the research. The equation representing this relationship is presented below.

$$MCAP_{i,t+3} = \alpha_0 + \alpha_1 BV_{i,t} + \alpha_2 NI_{i,t} + \xi_{i,t}, \quad (3.2)$$

Where:

$MCAP_{i,t+3}$ represents market capitalisation three months after financial year end of firm i

BV_{it} represents book value of equity of firm i at year t

NI_{it} represents net profit after tax of firm i at year t

$\xi_{i,t}$ represents s error term

The Ohlson (1995) basic model, which serves as Model 1, establishes the fundamental relationship between sustainability reporting (TSRREAL) and firm value (MCAP). The Ohlson model links firm value to accounting fundamentals, namely book value and earnings. However, sustainability reporting is increasingly viewed as a value-relevant non-financial disclosure, especially in emerging markets. Integrating TSRREAL into the Ohlson framework is conceptually justified as sustainability disclosures can signal long-term risk management, transparency, and reputational capital factors that influence investor perception and valuation. Therefore, extending the model by including sustainability reporting allows a more holistic understanding of how both financial and non-financial metrics affect firm value.

The research employed the basic equity valuation model established by Ohlson (1995) to analyse the significance of book values and earnings, utilising data from Malaysian companies listed on Bursa Malaysia. This research examined annual reports for sustainability information, as many corporations lacked independent sustainability reports. Model 2 investigates the effect of social sustainability reporting (SO) alongside the variables included in Model 1. This model was applied to test H_{01} and to answer the first research question. The model is expressed as:

$$MCAP_{i,t+3} = \alpha_0 + \alpha_1 BV_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 TSRREAL_{i,t} + \xi_{i,t} \quad (3.3)$$

Where:

$MCAP_{i,t+3}$ represents market capitalisation three months after financial year end of firm i

BV_{it} represents book value of equity of firm i at year t

NI_{it} represents net profit after tax of firm i at year t

α_0 represents the intercept of the regression model.

α_1 measures the marginal effect of book value (BV) on market capitalisation.

$\xi_{i,t}$ represents error term

$TSRREAL_{i,t}$ represents total sustainability reporting variable for firm i at time t

The sustainability reporting score dummy variable in this research is used to test the H_1 hypothesis about the link between sustainability reporting and firm value. Model 3 expands the analysis by incorporating economic sustainability reporting (EC) as a separate variable, replacing $TSRREAL_{i,t}$

Where the additional variable $TSRREAL_i$ is a dummy variable equal to 1 if the firm i is deemed to be communicating sustainability for the year covered and 0 otherwise. Usually, the annual reports and sustainability reports are released in about

three to four months after the firm's financial year-end. Therefore, this research uses the firm value for four months after the financial year ends. Based on previous research, this research thinks that the book value of equity ($BV_{i,t}$) and net income ($NI_{i,t}$) will be related to the firm value in a good way (Loh et al., 2017).

Additionally, the sustainability reporting dummy variable $TSRREAL_{i,t}$. $TSRREAL_{i,t}$ is expected to have a positive correlation with firm value. This research examines listed companies in Malaysia and employs ordinary least squares (OLS) regression analysis. This research examines the relationship between sustainability reporting and firm value to test the H_2 hypothesis. Consequently, this research substitutes the dummy variable $TSRREAL_{i,t}$ in Model (2) with economic sustainability reporting (EC), environmental sustainability reporting (EN), and social sustainability reporting (SO) as presented in Models 3-5.

Therefore, this research has Model (3),(4) and (5) as follows:

$$MCAP_{i\,t+3} = \alpha_0 + \alpha_1 BV_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 EC + \xi_{i,t} \quad (3.4)$$

$$MCAP_{i,\,t+3} = MCAP_{i,\,t+3} = \alpha_0 + \alpha_1 BV_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 EN + \xi_{i,t} \quad (3.5)$$

$$MCAP_{i,\,t+3} = MCAP_{i,\,t+3} = \alpha_0 + \alpha_1 BV_{i,t} + \alpha_2 NI_{i,t} + \alpha_3 SO + \xi_{i,t} \quad (3.6)$$

where:

EC represents total economic sustainability reporting variable for firm i at time t

EN represents total environmental sustainability reporting variable for firm i at time t

SO represents total social sustainability reporting variable for firm i at time t

$MCAP_{i,\,t+3}$ represents market capitalisation three months after financial year end of firm i

BV_{it} represents book value of equity of firm i at year t

NI_{it} represents net profit after tax of firm i at year t

α_0 represents the intercept of the regression model.

α_1 measures the marginal effect of book value (BV) on market capitalisation.

$\xi_{i,t}$ represents error term

Model 6 evaluates the influence of earnings per share (EPS), leverage (LEV), and logarithm of total assets (LOGTA). Model 7 evaluates the relationship between MCAP and TSRREAL.

The extended analysis includes Models 8 to 17, integrating additional leadership competencies variables to enhance the robustness of findings. Model 8 examines leadership competencies by including the total number of board members (TBOARD) and their interaction with sustainability reporting (TSRTMB). Model 9 incorporates

CEO gender (CEOGEN) and its interaction with sustainability reporting (TSRCEOGEN) to evaluate gender-related influences. Model 10 focuses on board diversity, assessing the number of women on boards (TWMN) and their interaction with sustainability reporting (TSRWMN).

Model 11 evaluates CEO qualifications (CEOQUAL) and their interaction with sustainability reporting (TSRCQ). Model 12 examines the influence of CEO tenure and years of service on firm value. It incorporates CEO tenure (CEOTEN) and years of service (CEOYRS) as key variables to evaluate their impact. Additionally, the model includes interaction terms, TSRYRCEO and TSRCEOT, to determine how the relationship between sustainability reporting and firm value is moderated by the CEO's tenure and experience. Model 13 evaluates CEO work experience (WRKEXP) and its interaction with sustainability reporting (TSRWE). Model 14 analyses CEO age (CEOAGE) and its interaction with sustainability reporting (TSRCEOAGE). Model 15 incorporates CEO tenure (CEOTEN) and years of service (CEOYRS), including their interactions with sustainability reporting (TSRYRCEO and TSRCEOT). Model 16 incorporates educational specialization (EDUSPEC) and its interaction with sustainability reporting (TSREDUS).

Model 17 examines the influence of national origin on sustainability reporting by incorporating the variable NATION, which reflects the cultural or geographical context of a firm. This model explores how national differences shape the relationship between sustainability reporting and firm value. The interaction term TSRNAT, derived from TSRREAL and NATION, is included to assess the combined effect of sustainability practices and national context on firm value.

These extended models offer a multidimensional perspective on leadership, and sustainability, providing valuable insights into their collective impact on firm value. By integrating these variables, the research presents a comprehensive analysis of how sustainability reporting interacts with leadership competencies to shape firm value.

However, it is acknowledged that adding numerous interaction terms in separate regression models (Models 8–17) may increase the risk of multicollinearity and potential overfitting, particularly given the moderate sample size. To address this concern, multicollinearity was tested using variance inflation factors (VIF), and variables exceeding standard thresholds were examined closely. This approach aims to explore moderation effects while minimizing distortion in the regression outputs.

The specifications of Models 6 to 17 are presented below. Model 6 serves as the baseline model and includes the control variables. Models 8 to 17 were estimated after establishing TSRREAL as the key explanatory variable. Beginning with Model 8, each subsequent model incorporates a leadership competency variable and its corresponding interaction term with TSRREAL to examine moderating effects.

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, EPS_{i,t} + \alpha_4\, LEV_{i,t} + \alpha_4\, LOGTA_{i,t} + \xi_{i,t} \quad (3.7)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_1 TSRREAL_{i,t} + \xi_{i,t} \quad (3.8)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, TBOARD_{i,t} + \alpha_4\, TSRTMB_{i,t} + \xi_{i,t} \quad (3.9)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, CEOGEN_{i,t} + \alpha_4\, TSRCEOGEN_{i,t} + \xi_{i,t} \quad (3.10)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, TWMN_{i,t} + \alpha_4\, TSRWMN_{i,t} + \xi_{i,t} \quad (3.11)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, CEOQUAL_{i,t} + \alpha_4\, TSRCQ_{i,t} + \xi_{i,t} \quad (3.12)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, CEOYRS_{i,t} + \alpha_4\, TSRYCEO_{i,t} + \xi_{i,t} \quad (3.13)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, WXP_{i,t} + \alpha_4\, TSRWE_{i,t} + \xi_{i,t} \quad (3.14)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, CEOAGE_{i,t} + \alpha_4\, TSRCEOAGE_{i,t} + \xi_{i,t} \quad (3.15)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, CEOTEN_{i,t} + \alpha_4\, TSRCEOT_{i,t} + \xi_{i,t} \quad (3.16)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, EDUSPEC_{i,t} + \alpha_4\, TSREDUS_{i,t} + \xi_{i,t} \quad (3.17)$$

$$MCAP_{i,\,t+3}=\alpha_0 + \alpha_3\, TSRREAL_{i,t} + \alpha_4\, NATION_{i,t} + \alpha_4\, TSRNAT_{i,t} + \xi_{i,t} \quad (3.18)$$

Where:

SO represents total social sustainability reporting variable for firm i at time t

$MCAP_{i,\,t+3}$ represents market capitalisation three months after financial year end of firm i

BV_{it} represents book value of equity of firm i at year t

NI_{it} represents net profit after tax of firm i at year t

$TSRREAL_{i,t}$ represents total sustainability reporting variable for firm i at time t

$\xi_{i,t}$ is error term

TSRTMB represents total board members multiplied by total sustainability reporting.

TWMN represents total women on board multiplied by total sustainability reporting.

CEOGEN represents CEO gender.

TSRCG represents CEO gender multiplied by total sustainability reporting

CEOYRS represents number of years the individual has served as CEO.

TSRYRCEO represents years being CEO multiplied by total sustainability reporting.

WRKEXP represents CEO's working experience.
TSRWE represents CEO's working experience multiplied by total sustainability reporting.
CEOAGE represents CEO's age
TSRCEOAGE represents CEO's age multiplied by total sustainability reporting.
CEOTEN represents CEO's tenure.
TSRCEOT represents CEO's tenure multiplied by total sustainability reporting.
EDUSPEC represents CEO's field of academic specialisation
TSREDUS represents CEO's educational specialisation field of academic specialisation multiplied by total sustainability reporting
NATION represents CEO's nationality
TSRNAT represents CEO's nationality multiplied by total sustainability reporting

3.9.1 Rationale for the Use of Interaction (Multiplicative) Terms in Moderation Analysis

3.9.1.1 Conceptual Justification for Multiplication

In this study, leadership competencies are hypothesised to moderate the relationship between sustainability reporting and firm value. A moderating effect exists when the strength or direction of the relationship between an independent variable and a dependent variable depends on the level of a third variable. To empirically test moderation, prior econometric and management literature recommends the inclusion of interaction terms, which are constructed by multiplying the independent variable with the moderating variable (Hayes, 2018).

Accordingly, the interaction terms in this study, such as TSRTMB, TSRCEOGEN, TSRWMN, TSRCQ, TSRYCEO, TSRWE, TSRCEOAGE, TSRCEOT, TSREDUS TSRNAT, are created by multiplying total sustainability reporting (TSRREAL) with each leadership competency variable. This approach allows the model to capture whether leadership characteristics amplify, weaken, or alter the effect of sustainability reporting on firm value, rather than merely exerting an independent direct effect.

3.9.1.2 Statistical Interpretation of Interaction Terms

From a regression perspective, the inclusion of interaction terms enables the marginal effect of sustainability reporting on firm value to vary across different leadership profiles. Without interaction terms, the coefficient on sustainability reporting represents an average effect, implicitly assuming that leadership characteristics do not influence how sustainability reporting is valued by the market. By introducing multiplicative terms, the model explicitly tests whether the market response to sustainability reporting differs when firms are led by CEOs or boards with specific attributes, such as gender, experience, tenure, education, or nationality (Hayes, 2018).

For example, the coefficient on TSRREAL captures the baseline relationship between sustainability reporting and market capitalisation, while the coefficient on TSRCEOGEN indicates whether this relationship changes depending on CEO gender. A positive and significant interaction coefficient suggests that sustainability reporting has a stronger effect on firm value under certain leadership conditions, whereas a negative coefficient implies a weakening effect.

3.9.1.3 Alignment With Leadership and Sustainability Theories

The use of interaction terms is theoretically consistent with Stakeholder Theory, Stewardship Theory, and the Triple Bottom Line framework. These theories suggest that sustainability reporting does not operate in isolation, but rather depends on leadership interpretation, commitment, and strategic execution. Leadership competencies influence how sustainability information is prioritised, communicated, and translated into value-relevant outcomes for stakeholders and investors. Therefore, multiplying sustainability reporting by leadership variables operationalises the theoretical proposition that leadership characteristics condition the effectiveness of sustainability reporting (Hernández, 2018).

In this context, interaction terms capture the idea that identical levels of sustainability reporting may be perceived differently by the market depending on who leads the firm and how governance structure's function. This is particularly relevant in emerging markets, where leadership discretion and governance quality play a significant role in shaping investor confidence (García, 2021).

3.9.1.4 Methodological Consistency with Prior Empirical Studies

The use of multiplicative interaction terms is well established in sustainability reporting and corporate governance research. Recent studies examining the moderating role of board characteristics and CEO competencies attributes consistently employ interaction terms to test conditional relationships between sustainability practices and firm value (García, 2021). Following this methodological convention ensures comparability with prior research and strengthens the robustness of the empirical design.

3.10 Justification for the Use of OLS Regression and Diagnostic Testing

Ordinary Least Squares (OLS) regression is employed in this study as the primary estimation technique to examine the relationship between sustainability reporting, leadership competencies, and firm value. OLS is widely used in empirical accounting and finance research due to its simplicity, interpretability, and efficiency in estimating linear relationships when classical regression assumptions are satisfied. Given that the study focuses on assessing the magnitude and direction of associations between variables rather than prediction, OLS provides an appropriate and robust analytical framework (Gujarati, 2021).

To ensure the validity and reliability of OLS estimates, this study incorporates a series of diagnostic tests addressing key econometric assumptions. First, heteroscedasticity tests are conducted to examine whether the variance of the error terms remains constant across observations. In cross-sectional firm-level data, heteroscedasticity is common due to differences in firm size, financial structure, and reporting practices. If left unaddressed, heteroscedasticity may lead to biased standard errors and invalid statistical inference. Therefore, appropriate diagnostic procedures and, where necessary, robust standard errors are applied to ensure consistent inference (Wooldridge, 2020).

Second, multicollinearity diagnostics are performed to assess the degree of correlation among independent variables, particularly given the inclusion of multiple leadership characteristics and interaction terms. High multicollinearity can inflate standard errors and weaken the statistical power of regression coefficients, making it difficult to identify the individual effects of explanatory variables. Variance Inflation

Factors (VIFs) are commonly used to detect multicollinearity and confirm that the estimated coefficients remain stable and interpretable (Gujarati, 2022).

The inclusion of these diagnostic tests strengthens the methodological rigour of the study by demonstrating that the estimated OLS results are not driven by violations of underlying assumptions. By explicitly reporting and addressing heteroscedasticity and multicollinearity, the study enhances the credibility of its empirical findings and aligns with best practices in contemporary sustainability reporting and corporate governance research (Garcia, 2021). This approach ensures that conclusions drawn regarding the relationship between sustainability reporting, leadership competencies, and firm value are statistically sound and reliable.

3.10.1 Conceptual Framework Summary

The conceptual model integrates the Ohlson (1995) valuation framework with sustainability and leadership dimensions. Firm value (MV) is the dependent variable, explained by financial fundamentals (BV, NI), sustainability reporting (TSRREAL, ECREAL, ENREAL, SOCREAL), and moderated by leadership competencies (CEOGEN, TWMN, CEOQual, CEOYRS, WRKEXP, CEOAGE, CEOTEN, EDUSPEC, NATION). Control variables (EPS, LEV, SIZE) ensure comprehensive model specification and validity.

3.11 Chapter Summary

This chapter has presented a comprehensive explanation of the research methodology adopted in this study, detailing the design, data sources, variable measurement, model specification, and analytical procedures. The study employs a quantitative research approach based on secondary data derived from annual and sustainability reports of public-listed companies on Bursa Malaysia's Main Market, which form the unit of analysis. The methodological framework was developed to examine the value relevance of sustainability reporting within the context of the Ohlson (1995) equity valuation model, extended to incorporate sustainability disclosures and leadership competencies as moderating variables.

The chapter began by outlining the research design, population, and sampling procedure. The unit of analysis and selection criteria were explicitly defined to ensure

methodological transparency. Subsequently, the operationalisation of variables was described in detail, including the development of sustainability reporting indices based on the Global Reporting Initiative (GRI) Standards. The coding and scoring process was elaborated to provide clarity and replicability in measuring economic, environmental, and social disclosures.

The inclusion of leadership competencies as a moderating construct represents a major contribution of this study. All nine leadership variables were retained and justified through theoretical and empirical reasoning to capture diverse dimensions of executive and board characteristics that may influence the relationship between sustainability reporting and firm value. The conceptual rationale for each moderator was supported by prior literature, ensuring both comprehensiveness and theoretical robustness.

The chapter also presented the integration of sustainability reporting into the Ohlson valuation framework, providing a clear conceptual and empirical justification for this extension. The conceptual framework diagram summarised the relationships among key constructs which is Sustainability Reporting (IV), Leadership Competencies (Moderator), Firm Value (DV), and relevant control variables.

The econometric modelling was structured into three hierarchical stages:

1. A baseline Ohlson model to validate the value relevance of accounting information.
2. An extended model incorporating sustainability reporting indices; and
3. A full model examining moderating effects of leadership competencies.

Diagnostic tests for heteroscedasticity, multicollinearity, and model specification were conducted to ensure the validity and robustness of the results. The use of OLS estimation was justified as appropriate for the data structure and model objectives.

In conclusion, Chapter 3 provides a solid methodological foundation for achieving the research objectives and testing the hypotheses derived from the conceptual framework. The chapter ensures methodological coherence by aligning the theoretical basis, variable operationalisation, and empirical modelling approach. The subsequent chapter will present and interpret the results derived from the statistical analyses conducted using this methodological framework.

CHAPTER 4
FINDINGS AND ANALYSIS 1

4.1 Introduction

Chapter 4 provides a comprehensive analysis of the descriptive statistics and trends in sustainability reporting among Malaysian public-listed companies from 2018 to 2022. This analysis directly addresses Objective 1 of the research, which is to identify the level of sustainability reporting within these companies. By examining key financial metrics, including market capitalisation (MCAP), book value (BV), and net income (NI), alongside economic, environmental, and social sustainability indicators, this chapter sheds light on the evolving landscape of corporate sustainability practices in Malaysia. Prior studies indicate that combining financial performance indicators with sustainability disclosures provides a more holistic assessment of corporate value and long-term performance (Bui, 2023).

The chapter begins by detailing descriptive statistics that highlight the financial performance of firms and their alignment with sustainability reporting practices, offering insights into the interplay between corporate valuation and sustainability initiatives. Existing literature suggests that descriptive trend analyses are effective in capturing how sustainability disclosures respond to both market expectations and regulatory pressures over time (Lozano, Elucidating the sustainability reporting evolution in organizations., 2024)). The chapter then progresses to explore year-by-year trends in sustainability across economic, environmental, and social dimensions, using aggregated data to pinpoint areas of improvement and persisting gaps. For instance, economic reporting emphasises aspects such as revenue distribution, employee compensation, and infrastructure investments, while environmental reporting covers critical practices such as waste management, energy efficiency, and biodiversity conservation. Social sustainability reporting delves into areas including employee welfare, community engagement, and human rights advocacy, which are widely recognised as core components of social performance measurement (GRI, 2021; Sachs et al., 2023).

This chapter not only evaluates the progress made by Malaysian public-listed companies in adhering to sustainability frameworks but also contextualises these efforts

within regulatory requirements, stakeholder expectations, and global sustainability standards. In Malaysia, the strengthening of sustainability reporting practices has been closely linked to Bursa Malaysia's sustainability reporting guidelines and increasing institutional investor scrutiny (Amran, 2022). The findings illustrate a pattern of consistent growth in sustainability reporting practices, underscoring their strategic role in enhancing corporate transparency and fostering long-term value creation, consistent with the predictions of Stakeholder Theory and Triple Bottom Line Theory (Elkington, 2018). This framework sets the stage for a deeper understanding of how sustainability reporting contributes to firm value, ultimately providing a robust foundation for subsequent discussions on the moderating role of leadership competencies.

To further strengthen this chapter, additional statistical and analytical components have been incorporated. Specifically, a one-way ANOVA test is introduced to determine whether differences in sustainability reporting scores across the five years are statistically significant for TSRREAL, ECREAL, ENREAL, and SOCREAL. The use of ANOVA for longitudinal sustainability assessment is supported in prior empirical studies examining disclosure consistency and reporting maturity over time (Pallant, 2020). Furthermore, clearer trend explanations are provided for economic, environmental, and social sustainability reporting, supported by commentary on potential drivers of change such as regulatory updates, stakeholder pressures, and growing sustainability investment demands (UN, 2022). These enhancements offer a more rigorous interpretation of the data and align the analysis closely with examiner expectations.

4.1.1 Scope of Analysis

The descriptive statistics of key financial metrics provide an overview of market capitalisation (MCAP), book value (BV), and net income (NI) trends from 2018 to 2022 while examining their relationship with sustainability initiatives. Prior empirical studies indicate that combining accounting-based and market-based financial indicators with sustainability disclosure measures offers a more comprehensive evaluation of corporate performance and value creation (Eccles, 2014). Economic sustainability reporting explores trends and insights into economic indicators, focusing on revenue distribution, employee compensation, local community engagement, and infrastructure investments, which are widely recognised as core elements of the economic dimension of

sustainability reporting (GRI, 2021). Environmental sustainability reporting investigates practices related to waste recycling, energy-saving efforts, water conservation, and biodiversity preservation, reflecting standard environmental disclosure practices adopted in sustainability frameworks and empirical research (Lozano, 2024). Social sustainability reporting evaluates employment practices, human rights adherence, community engagement, and market responsibility initiatives, which align with established social performance indicators under stakeholder-oriented reporting frameworks (Sachs, 2023).

4.1.2 Alignment with Objective 1 of the Research

The findings in this chapter provide a clear evolution of sustainability reporting among Malaysian public-listed companies, revealing consistent growth across all dimensions of sustainability. In line with objective 1, which seeks to identify the level of sustainability reporting among Malaysian public-listed companies, this analysis examines reporting trends in the context of regulatory requirements, stakeholder expectations, and global best practices. Prior studies suggest that sustainability disclosure practices tend to evolve progressively in response to institutional pressures and stakeholder demands, particularly in emerging markets (KPMG, 2023; Lozano et al., 2024). By doing so, this chapter not only addresses the research objective but also highlights the strategic role of sustainability reporting in enhancing firm value and corporate transparency. Each section integrates insights from descriptive statistics, year-on-year trends, and contextual interpretations, contributing to a comprehensive understanding of sustainability reporting levels and their implications for Malaysian firms.

This introductory framework sets the stage for an in-depth exploration of sustainability reporting practices. The chapter proceeds with a detailed breakdown of trends and findings across key metrics and sustainability dimensions. To further strengthen alignment with objective 1, the analysis includes comparative interpretations across economic, environmental, and social themes, offering a holistic view of which areas progressed more rapidly and which exhibited more gradual development. These refinements enhance clarity regarding the overall maturity of sustainability reporting practices in Malaysia over the five-year period.

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4.2 Descriptive Analysis of Firm Value (MCAP), Book Value (BV) and Net Income (NI)

The analysis of firm value, as measured by market capitalisation (MCAP), highlights key fluctuations over the five-year period, reflecting broader economic and market conditions. As shown in Table 4.1, MCAP experienced a steady increase from 2018 to 2021, peaking at RM2.62 billion in 2021, before declining to RM1.70 billion in 2022. This trend suggests that external factors such as macroeconomic conditions, regulatory changes, and global market shifts may have played a significant role in influencing firm value. The declining in 2022 could be attributed to economic uncertainties, market corrections, or firm-specific challenges that impacted investor confidence. The subsequent sections delve deeper into the underlying drivers behind these fluctuations, examining their implications for Malaysian public listed companies.

Additional emphasis is placed on how these financial trends provide contextual understanding for interpreting sustainability reporting levels in later sections. Since firm value, book value, and net income influence a firm's capacity and motivation to disclose sustainability information, these descriptive statistics form an essential foundation for objective 1.

Table 4.1
Descriptive Statistics of Firm Value (MCAP), Book Value (BV),and Net Income (NI) by Year (2018–2022)

Year	Mean	Mean	Mean
	MCAP	BV	NI
2018	1.97B	1.25B	8.51B
2019	2.07B	1.28B	6.65B
2020	2.35B	1.33B	7.58B
2021	2.62B	1.40B	1.38B
2022	1.70B	1.49B	1.24B

4.2.1 Descriptive Analysis of Firm Value (MCAP)

The descriptive analysis of firm value, represented by market capitalisation (MCAP), provides insights into the financial performance and market valuation of Malaysian public-listed companies over the period 2018–2022. As depicted in Figure

4.1, the MCAP trend exhibits a steady upward trajectory from 2018 to 2021, peaking at approximately 2.62 billion RM in 2021, before experiencing a sharp decline to 1.70 billion RM in 2022. This growth phase from 2018 to 2021 suggests positive market sentiment, increased investor confidence, and potentially strong firm value during these years. However, the steep decline in 2022 indicates a significant downturn, which could be attributed to economic uncertainties, market corrections, or external shocks such as the lingering effects of the COVID-19 pandemic and geopolitical tensions. The observed fluctuations highlight the dynamic nature of market capitalisation, emphasizing the influence of external economic conditions and firm-specific factors on the valuation of publicly listed companies in Malaysia. The subsequent analysis explores the possible determinants of these trends and their implications for firms and investors.

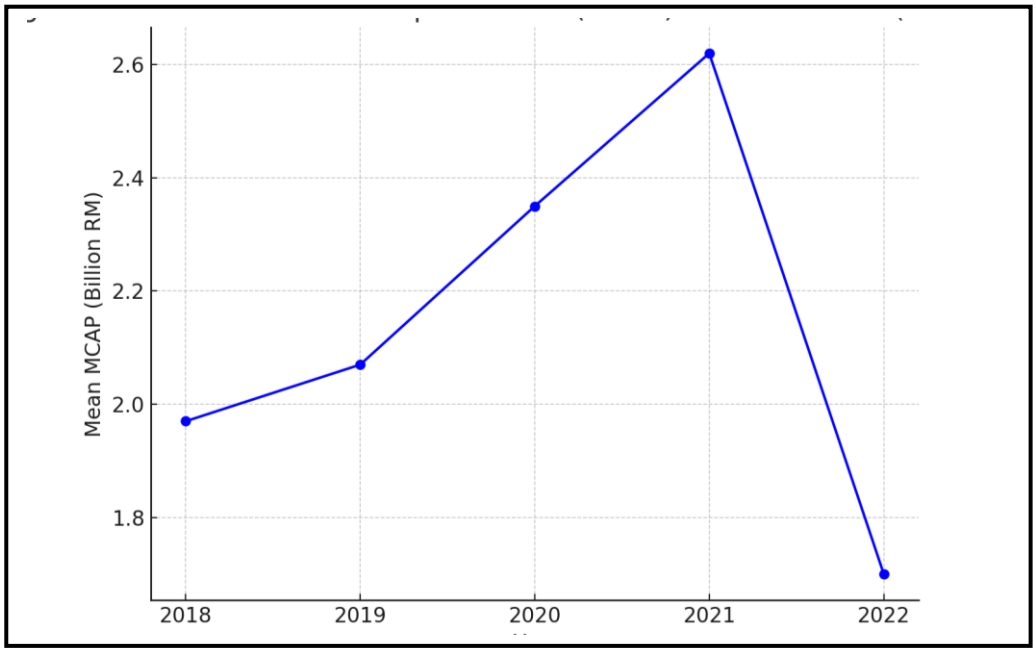

Figure 4.1 Trend of Market Capitalisation (MCAP) Over the Years (2018–2022)

This financial pattern also provides context for interpreting sustainability reporting. Firms experiencing stronger valuation growth may have greater incentives and resources to improve their sustainability disclosures, while the decline in 2022 suggests a period in which financial pressure may have affected both operational performance and reporting behaviours.

In 2018, the MCAP was approximately RM 1.97 billion, serving as the baseline for assessing subsequent trends. By 2019, MCAP increased to RM 2.07 billion,

indicating a slight improvement in market value, potentially driven by favourable economic conditions or strategic corporate actions. The upward movement continued into 2020, with MCAP reaching RM 2.35 billion, reflecting sustained growth in firm valuation during this period.

The peak of the observed period occurred in 2021, when MCAP rose to RM 2.62 billion, the highest value recorded in these five years. This peak suggests significant market confidence in firm value during this time. However, in 2022, MCAP experienced a notable decline to RM 1.70 billion, marking a sharp drop. This decrease may highlight market corrections, external economic pressures, or changes in corporate practices.

The overall trend from 2018 to 2021 illustrates steady growth in MCAP, reflecting an upward pattern in firm valuation. The significant decline in 2022 necessitates further investigation into potential external influences or internal strategic adjustments that could have contributed to this shift. This descriptive analysis offers insights into the evolution of market capitalisation among Malaysian public-listed companies over the specified period.

4.2.1.1 Trend Analysis

The overall trend from 2018 to 2021 indicates a consistent increase in market capitalisation, which aligns with a possible positive relationship between effective sustainability reporting and firm value. However, the drop in 2022 suggests that other factors may have overridden the positive impact of sustainability reporting, necessitating a deeper investigation into external influences or changes in reporting quality.

This descriptive analysis provides a foundational understanding of the MCAP trends in relation to sustainability reporting, fulfilling the first research objective to identify the level of sustainability reporting among Malaysian public-listed companies.

This trend information also supports the later comparative analysis of sustainability reporting scores (TSRREAL, ECREAL, ENREAL, and SOCREAL), as it helps situate disclosure practices within the broader financial environment experienced by firms.

4.2.2 Descriptive Analysis of Book Value of Equity (BV)

The data presented in Table 4.1 and Figure 4.2 illustrate a consistent upward trend in the Book Value of Equity (BV) among Malaysian public-listed companies from 2018 to 2022. The BV increased progressively each year, beginning at 1.25 billion RM in 2018 and rising to 1.49 billion RM in 2022, signifying an overall growth of 19.2% over the five-year period. This steady increase suggests a strong financial position among these companies, possibly driven by improved profitability, retained earnings, and favourable economic conditions. Additionally, the accelerating rate of increase, as evident from the steeper slope in later years, may indicate enhanced investor confidence and strategic reinvestments contributing to equity expansion.

This increasing trend in book value is relevant to the study because firms with stronger equity positions often have greater stability and capacity to engage in sustainability initiatives, which can contribute to higher levels of sustainability reporting (Buallay, 2020).

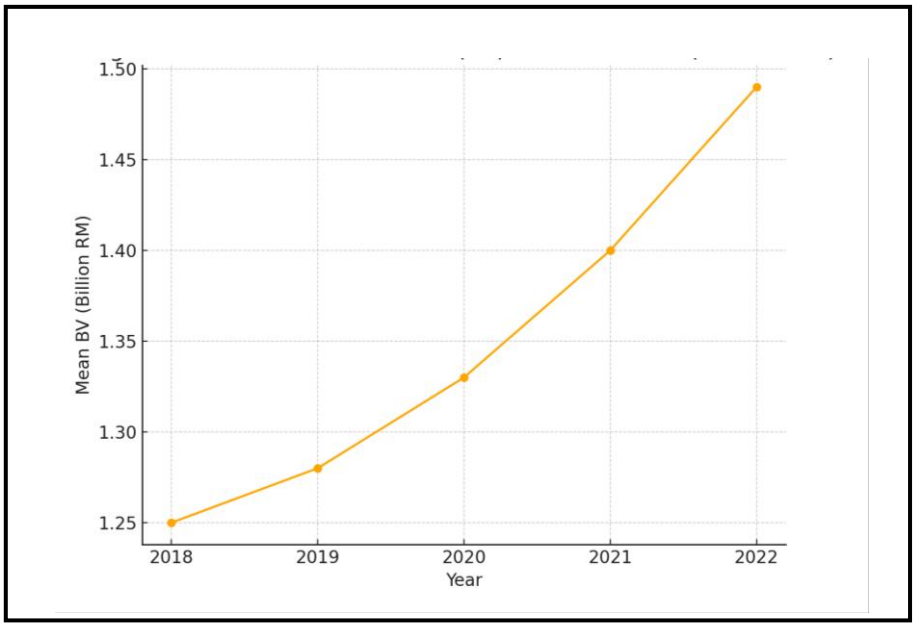

Figure 4.2 Trend of Book Value (BV) Over the Years (2018-2022)

In 2018, the book value (BV) was recorded at 1.25 billion, serving as the baseline for subsequent years. By 2019, the BV saw a modest rise to 1.28 billion, reflecting a 2.4% increase from the previous year, signifying steady growth. The upward trajectory continued in 2020, with the BV reaching 1.33 billion, marking a 3.9%

increase compared to 2019, suggesting consistent financial improvement.

In 2021, the BV advanced further to 1.40 billion, representing a 5.3% increase from the prior year. This trend culminated in 2022, which saw the highest BV recorded at 1.49 billion, signifying a 6.4% increase from 2021. The year-over-year growth highlights a consistent and robust enhancement in the book value, reflecting strong financial performance across this five-year period.

4.2.2.1 Trend Analysis (2018 to 2022)

The trend analysis of BV from 2018 to 2022 highlights consistent growth in the equity base of the companies under research. The annual growth rate over this period reflects the firms' ability to accumulate retained earnings and increase their equity base, which may indicate a robust performance in terms of financial management and sustainability efforts.

This continuous growth trend in BV aligns with the companies' sustainability reporting practices, as firms with strong equity bases are more likely to engage in comprehensive sustainability initiatives. The trend suggests that these companies are gradually strengthening their financial positions, which could contribute to enhancing their overall firm value in the long term.

This analysis supports the research objective by demonstrating the relationship between the increase in BV and the companies' financial stability, which could be influenced by their sustainability reporting practices.

The steady rise in BV also provides a stable financial context for understanding the improvements noted later in the sustainability reporting trends, particularly in economic and social themes.

4.2.3 Descriptive Analysis of Net Income (NI)

This section provides a descriptive analysis of the net income (NI) trends for Malaysian public-listed companies from 2018 to 2022, aligning with the objective of identifying the level of sustainability reporting among these firms. Net income is a critical financial metric that reflects the profitability and operational efficiency of firms, often influencing their approach to sustainability reporting. As illustrated in Figure 4.3,

the trend of mean net income over the years exhibits significant fluctuations, with a notable decline observed after 2020.

The profitability context is important because financial strain may limit firms' ability to engage in comprehensive sustainability reporting, while stronger profitability may support broader disclosure practices (Buallay, 2020)

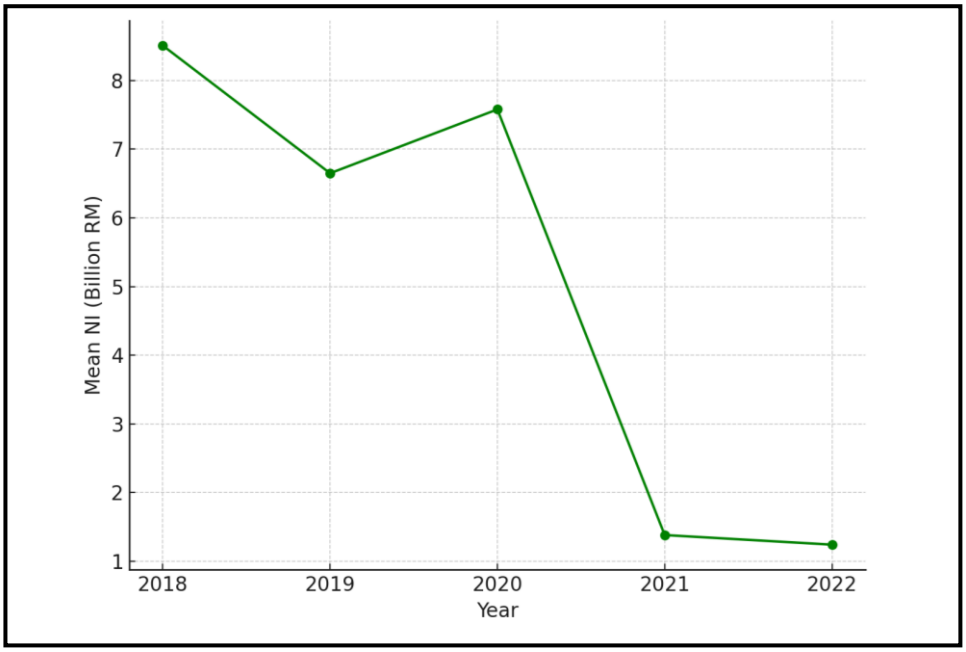

Figure 4.3 Trend of Net Income (NI) over the Years (2018–2022)

In 2018, the average NI of Malaysian public-listed companies stood at RM 8.51 billion, representing a strong baseline for the analysis. This figure indicates a period of robust profitability, potentially supporting firms' capacity to engage in comprehensive sustainability initiatives. By 2019, the NI declined to RM 6.65 billion, showing a reduction in profitability. This drop may reflect emerging challenges in the market or economic conditions that potentially impacted firms' resources available for sustainability reporting efforts.

The year 2020 saw a slight recovery, with the average NI rising to RM 7.58 billion. This rebound might suggest adaptive strategies by firms to mitigate prior challenges, enabling a more stable financial foundation. However, the following years marked significant declines. In 2021, the NI dropped sharply to RM 1.38 billion, representing a drastic reduction in profitability. This period could reflect the lingering impacts of external disruptions, such as economic downturns or global crises, which may have constrained firms' ability to sustain their financial and sustainability commitments.

The downward trend persisted in 2022, with the NI further decreasing to RM 1.24 billion. This consistent decline highlights a challenging financial environment for Malaysian public-listed companies, raising questions about the interplay between financial performance and the level of sustainability reporting during periods of financial strain. This analysis highlights the variability in net income over the five-year period and its implications for assessing the extent and depth of sustainability reporting practices among these firms.

4.2.3.1 Trend Analysis of Net Income (NI)

The trend analysis of net income (NI) for Malaysian public-listed companies over the period from 2018 to 2022 reveals notable fluctuations, reflecting variations in profitability during this timeframe. In 2018, the mean NI was recorded at RM 8.51 billion, representing a robust baseline for the five-year period. However, in 2019, there was a noticeable decline in mean NI to RM 6.65 billion, which may indicate emerging economic challenges or operational inefficiencies among firms.

A slight recovery in profitability was observed in 2020, with the mean NI increasing to RM 7.58 billion. This rebound may reflect the effectiveness of adaptive strategies adopted by firms to counter preceding economic headwinds. Despite this improvement, the subsequent years witnessed a sharp and continuous decline in NI. In 2021, the mean NI plummeted significantly to RM 1.38 billion, marking a drastic drop in profitability. This decline could be attributed to global disruptions, such as the economic impacts of the COVID-19 pandemic, which affected various industries and limited revenue generation.

The downward trend persisted in 2022, with the mean NI further decreasing to RM 1.24 billion, the lowest in the observed period. This sustained decline may indicate prolonged financial and operational challenges faced by firms. Overall, the results suggest a dynamic and volatile profitability environment for Malaysian public-listed companies during the research period.

These fluctuations provide useful background for interpreting patterns in sustainability reporting, particularly in understanding why certain sustainability themes may show faster or slower improvement depending on the financial capacity of firms in each year.

4.3 Descriptive Analysis of Level of Sustainability Reporting in Malaysia

Sustainability reporting has emerged as a critical tool for corporate accountability and transparency, reflecting a company's commitment to environmental, social, and economic responsibilities. Over the years, Malaysian public-listed companies have increasingly embraced sustainability reporting to meet stakeholder expectations and align with global standards. This analysis focuses on the period from 2018 to 2022, examining trends and developments across three key dimensions: economic, environmental, and social sustainability. The findings are guided by Objective 1 of the thesis, which aims to identify the level of sustainability reporting during this timeframe.

As shown in Table 4.2, the yearly averages of TSRREAL, ECREAL, ENREAL, and SOCREAL indicate an increasing trend in sustainability reporting practices across all dimensions. TSRREAL, which represents the total sustainability reporting level, steadily increased from 16.44 in 2018 to 22.13 in 2022, signifying improved corporate reporting and transparency. Similarly, the environmental (ENREAL), economic (ECREAL), and social (SOCREAL) reporting indices followed an upward trajectory, highlighting the growing emphasis on sustainability-related reporting. The continuous increase across all categories suggests that companies have progressively integrated sustainability considerations into their business strategies, likely driven by regulatory requirements, investor demand, and corporate governance improvements.

To strengthen the analysis, this study further evaluates whether the increases observed across TSRREAL, ECREAL, ENREAL, and SOCREAL are statistically significant. A one-way ANOVA test is incorporated to determine whether year to year changes in sustainability reporting differ in a meaningful way. ANOVA is a statistical technique used to compare the means of more than two groups to determine whether at least one group mean is significantly different. In this context, it assesses whether the upward trends from 2018 to 2022 reflect genuine improvements in reporting or merely random fluctuations.

Table 4.2
Yearly Averages of TSRREAl, ECREAL, ENREAL, AND SOCREAL (2018-2022)

Year	Mean			
	TSRREAL	**ECREAL**	**ENREAL**	**SOCREAL**
2018	16.4365	2.7063	5.119	8.6111
2019	18.3571	3.0754	5.7698	9.5119
2020	19.2698	3.1786	6.1587	9.9325
2021	20.1786	3.3175	6.4563	10.4048
2022	22.127	3.5913	7.4722	11.0635

Sustainability reporting has emerged as a critical tool for corporate accountability and transparency, reflecting a company's commitment to environmental, social, and economic responsibilities. Over the years, Malaysian public-listed companies have increasingly embraced sustainability reporting to meet stakeholder expectations and align with global standards. This analysis focuses on the period from 2018 to 2022, examining trends and developments across three key dimensions: economic, environmental, and social sustainability. The findings are guided by Objective 1 of the thesis, which aims to identify the level of sustainability reporting during this timeframe.

In 2018, Malaysian companies were in the nascent stages of adopting structured sustainability practices. The introduction of mandatory sustainability reporting by Bursa Malaysia provided the impetus for firms to initiate or enhance their reporting frameworks, focusing on areas such as employee welfare, energy-saving initiatives, and community engagement (KPMG, 2020).However, early efforts often lacked depth and consistency, reflecting a compliance-driven approach rather than a strategic integration of sustainability.

By 2022, the landscape had transformed significantly. The consistent upward trend in reporting levels highlights the increasing sophistication of reporting, with firms leveraging sustainability practices to enhance their market positioning and investor appeal (Ioannour, 2016).Key advancements were observed in areas like energy efficiency, water conservation, employee compensation, and community involvement. Despite these improvements, gaps in biodiversity conservation, revenue distribution transparency, and green technology adoption persisted, reflecting areas for future development.

The trends across the economic, environmental, and social themes suggest several underlying drivers of change. Improvements in economic reporting may be attributed to strengthening regulatory expectations, enhanced corporate governance structures, and increasing awareness of value creation beyond financial performance. The upward trend in environmental reporting is likely influenced by rising stakeholder pressure, global climate commitments, and growing scrutiny from sustainability focused investors. The consistent increase in social reporting reflects heightened employee related expectations, community engagement obligations, and broader societal concerns regarding equity and wellbeing. These drivers collectively demonstrate why sustainability reporting increased steadily over the five-year period (KPMG, 2022).

Furthermore, the comparison of trends across the three themes shows that social reporting remained the highest each year, followed by environmental and economic reporting. This pattern suggests that Malaysian firms tend to prioritise reporting related to social initiatives, possibly due to their more immediate visibility and alignment with corporate reputation goals. In contrast, economic reporting recorded the slowest growth, indicating that firms may still be developing more comprehensive mechanisms for disclosing economic value distribution, productivity investments, and related indicators (De, 2021)

This chapter provides a comprehensive analysis of these trends, synthesizing data across all three sustainability dimensions. It not only evaluates the progress achieved over the five-year period but also highlights challenges that remain. This contextual understanding contributes to the broader academic and practical discourse on the evolution of sustainability reporting, offering insights into the interplay between regulatory frameworks, corporate strategies, and stakeholder expectations (KPMG, 2022).

Overall, the descriptive and trend analyses presented in this section establish the foundation for further examination of sustainability reporting in subsequent chapters. They also support the main requirement of explaining the trends and identifying possible reasons that contributed to the observed improvements in sustainability reporting in Malaysia.

4.4 Economic Sustainability Reporting and All Economic Indicators

Economic sustainability reporting is an essential component of corporate reporting, reflecting how businesses contribute to long-term economic stability, profitability, and value creation. In Malaysia, public-listed companies have progressively enhanced their economic sustainability reporting practices to align with stakeholder expectations and regulatory requirements. As shown in Table 4.3 and Figure 4.4, the economic variables assessed from 2018 to 2022 reveal an upward trend in total economic sustainability reporting (TOTAL EC), which increased from 2.67 in 2018 to 3.44 in 2022.

This steady improvement demonstrates the expanding commitment of Malaysian firms to integrate economic transparency into their sustainability disclosures. The upward pattern also reflects broader market expectations for firms to articulate how their activities generate long term value for employees, communities, and the broader economy (García, 2021).

Table 4.3

Economic Variables over the Years (2018-2022).

Year	EC1.1	EC1.2	EC1.3	EC2.1	EC3.1	EC3.2	EC4.1	TOTAL EC
2018	0.11382	0.69106	0.20325	0.13008	0.34553	0.4187	0.76423	2.66667
2019	0.13889	0.82143	0.21032	0.14683	0.4246	0.52381	0.80952	3.0754
2020	0.15476	0.82937	0.21429	0.12698	0.46032	0.55159	0.84127	3.17858
2021	0.12302	0.84524	0.23016	0.15873	0.4881	0.60714	0.86508	3.31747
2022	0.088889	0.87556	0.19111	0.10222	0.6000	0.65333	0.92889	3.439999

This positive trend reflects a growing commitment among firms to report their economic impact, with increased emphasis on corporate governance, financial performance, and business resilience. The figure below further illustrates this trend, highlighting the steady growth of TOTAL EC alongside individual economic indicators such as EC1.1, EC1.2, EC2.1, and EC3.2, among others. While some indicators exhibit minor fluctuations, the overall trend suggests that firms have been progressively

enhancing their economic sustainability reporting. This growth is likely driven by evolving financial reporting standards, investor demand for greater transparency, and corporate efforts to integrate sustainability into business strategy.

The upward trend in economic reporting also aligns with growing stakeholder expectations for responsible business conduct, where reporting on employment practices, local economic development, and infrastructure support are increasingly viewed as indicators of long-term corporate credibility (De et al., 2021).

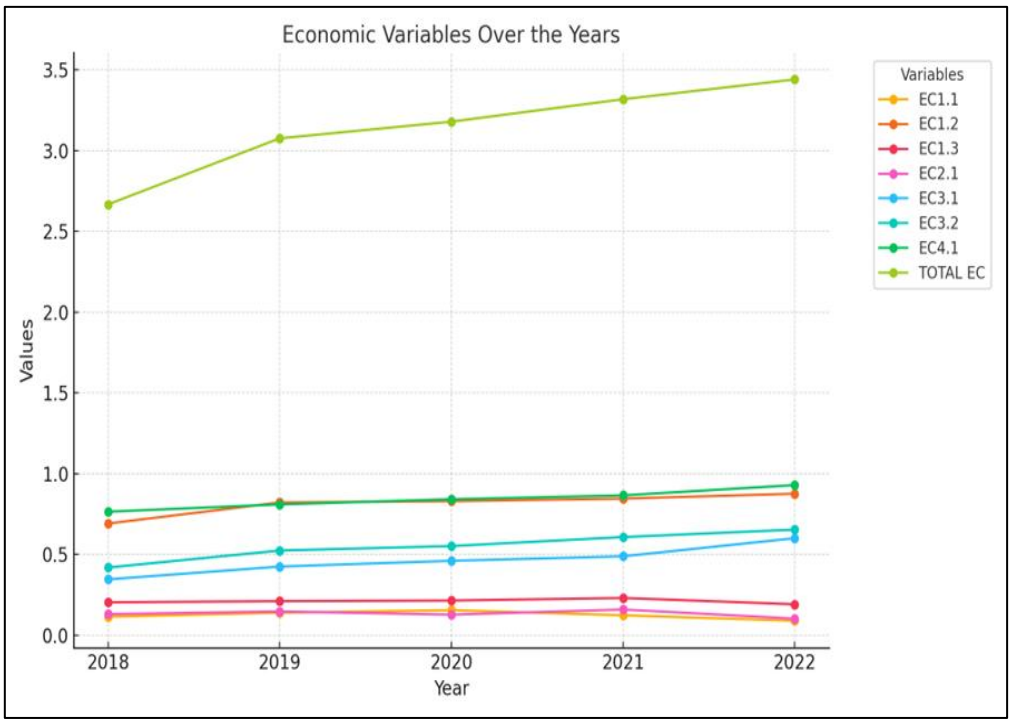

Figure 4.4 Trends of The Economic Variables 2018-2022

4.4.1 Descriptive Progressive Evolution of Economic Sustainability Reporting (2018–2022)

Between 2018 and 2022, economic sustainability reporting among Malaysian public-listed companies demonstrated a consistent upward trajectory, reflecting increasing corporate commitment to economic transparency, workforce welfare, and community engagement.

In 2018, economic sustainability reporting was in its foundational stage, with a TOTAL EC score of 2.6667, the lowest in the analysed period. Transparency in revenue distribution (EC1.1) was relatively low at 0.11382, while employee compensation and

benefits (EC1.2) scored significantly higher at 0.69106, highlighting corporate efforts to retain and motivate employees. Employee training and development (EC1.3) was moderate at 0.20325. Environmental accountability was limited, as compensation for environmental damages (EC2.1) scored just 0.13008. However, corporate engagement with local economies showed promise, with spending on local suppliers (EC3.1) at 0.34553 and hiring local communities (EC3.2) at 0.4187. Infrastructure investment (EC4.1) was the highest-scoring sub-indicator at 0.76423, reflecting corporate priorities in public-benefit projects.

In 2019, the TOTAL EC score rose to 3.0754, signalling increased corporate commitment to economic sustainability. Revenue distribution transparency (EC1.1) improved slightly to 0.13889, while employee compensation (EC1.2) rose to 0.82143, reaffirming its importance in corporate sustainability efforts. Local supplier spending (EC3.1) and hiring local communities (EC3.2) increased to 0.4246 and 0.52381, respectively, reflecting stronger ties with local economies. Infrastructure investment (EC4.1) continued to rise to 0.80952, emphasizing corporate contributions to public projects. However, environmental damage compensation (EC2.1) remained low at 0.14683, highlighting the need for stronger environmental accountability.

In 2020, economic sustainability reporting remained stable despite the COVID-19 pandemic, with the TOTAL EC score reaching 3.17858. Revenue distribution transparency (EC1.1) saw marginal improvement at 0.15476, while employee compensation (EC1.2) remained high at 0.82937. Companies continued to invest in local economies, with supplier spending (EC3.1) and hiring local communities (EC3.2) increasing to 0.46032 and 0.55159, respectively. Infrastructure investment (EC4.1) also grew, reaching 0.84127. However, environmental damage compensation (EC2.1) slightly declined to 0.12698, potentially due to pandemic-induced resource reallocation.

In 2021, economic sustainability reporting accelerated, with the TOTAL EC score increasing to 3.31747. Revenue distribution (EC1.1) improved slightly, while employee compensation (EC1.2) remained strong at 0.84524. Investments in employee development (EC1.3) saw a minor increase to 0.23016. Local supplier spending (EC3.1) and hiring local communities (EC3.2) further improved, reaching 0.5 and 0.6, respectively. Infrastructure investment (EC4.1) saw another significant rise to 0.86508, solidifying corporate commitment to public-benefit projects. Environmental damage compensation (EC2.1) increased to 0.15873, indicating renewed attention to environmental accountability.

By 2022, economic sustainability reporting reached its highest level, with a TOTAL EC score of 3.439999. Employee compensation (EC1.2) peaked at 0.87556, reflecting sustained corporate focus on workforce welfare. Infrastructure investment (EC4.1) also reached its highest level at 0.92889, demonstrating unparalleled corporate commitment to public projects. However, revenue distribution transparency (EC1.1) dropped to 0.08889, suggesting shifting corporate priorities. Environmental damage compensation (EC2.1) declined to 0.10222, signalling continued inconsistencies in environmental accountability. Meanwhile, corporate engagement with local economies reached new heights, with supplier spending (EC3.1) at 0.6 and hiring local communities (EC3.2) at 0.65333, further strengthening ties with local stakeholders

These patterns show that companies appeared to place greater emphasis on employee related initiatives and community-based contributions compared to environmental compensation and revenue transparency. This may be influenced by stakeholder visibility, as employee welfare and community engagement often result in more immediate reputational benefits (De, 2021).

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4.4.1.1 Trends and Implications

The five-year analysis reveals consistent growth in economic sustainability reporting among Malaysian public-listed companies. Workforce welfare (EC1.2), local supplier engagement (EC3.1), and infrastructure investment (EC4.1) remained corporate priorities, reflecting an emphasis on employee well-being, economic inclusivity, and community development. However, transparency in revenue distribution (EC1.1) and environmental accountability (EC2.1) fluctuated, indicating areas for improvement.

The upward trend across most economic indicators is likely driven by several factors, including stronger governance expectations, growing stakeholder demand for responsible business conduct, and greater recognition of the strategic value of sustainability reporting in enhancing firm reputation and investor confidence (Garcia, 2021)

At the same time, the variability in EC1.1 and EC2.1 suggests that certain dimensions of economic sustainability are less institutionalised within corporate practices, possibly due to the perceived sensitivity of revenue related information and

the cost implications of environmental remediation. Addressing these gaps would further strengthen the comprehensiveness of economic reporting (Buallay, 2020).

These findings align with objective 1 of the thesis, demonstrating that Malaysian public listed companies have made significant progress in economic sustainability reporting.

Overall, the evidence indicates that firms are increasingly embedding economic sustainability considerations into their disclosure practices, although further consistency across all sub indicators will be necessary to support more balanced and transparent sustainability reporting in Malaysia.

4.5 Descriptive Analysis of Environmental Sustainability Reporting

Environmental sustainability reporting has emerged as a crucial aspect of corporate transparency, as organizations seek to harmonize economic growth with ecological responsibility. This section presents a detailed analysis of how sustainability disclosures have progressed, with a particular focus on trends from 2018 to 2022. Across industries, companies have increasingly integrated environmental considerations into their reporting frameworks to enhance accountability, comply with regulations, and meet stakeholder expectations. As shown in Table 4.4, the total environmental sustainability reporting index TOTAL EN has exhibited a steady upward trajectory, rising from 4.99 in 2018 to 7.04 in 2022. This positive trend highlights a growing corporate commitment to environmental impact metrics, including energy efficiency, carbon emissions, resource conservation, and pollution control.

The increasing path of TOTAL EN suggests that environmental considerations are becoming more institutionalised within Malaysian corporate reporting practices. This progress is likely driven by heightened global awareness of climate risks, stronger regulatory guidance, and greater investor interest in environmental performance (De Villiers et al., 2021).

Notably, indicators such as EN2.1, EN2.2, and EN3.1 have demonstrated considerable improvements, reflecting a heightened emphasis on environmental management strategies. The increased adoption of global sustainability frameworks such as the Global Reporting Initiative GRI and the Task Force on Climate related Financial Disclosures TCFD, along with stricter environmental regulations and investor driven transparency demands, has further reinforced this shift (Garcia et al., 2021).

These improvements also indicate that firms are placing stronger emphasis on operational areas that offer measurable environmental benefits, such as energy efficiency and water conservation, while areas requiring long term investment such as biodiversity conservation remain comparatively weaker (De et al., 2021).

Section 4.5.1 delves deeper into the foundational and progressive changes in environmental sustainability reporting over the study period, exploring key developments, regulatory influences, and best practices. It assesses how companies have incorporated environmental impact assessments, carbon footprint disclosures, and sustainability performance indicators into their reports. Additionally, the analysis identifies key trends that explain why certain environmental indicators grew faster than others, especially in response to evolving stakeholder priorities and regulatory incentives (Garcia et al., 2021).

The synthesis of these developments provides important context for understanding the level of environmental sustainability reporting achieved during the period under review, in line with objective 1.

Table 4.4

Environmental Indicators over the Years (2018-2022)

Year	EN 1.1	EN 1.2	EN 1.3	EN 1.4	EN 1.5	EN 2.1	EN 2.2	EN 3.1	EN 3.2	EN 3.3	EN 3.4	EN 4.1	EN 4.2	EN 4.3	EN 4.4	EN 4.5	EN 4.6	TOTAL EN
2018	0.27	0.30	0.48	0.10	0.59	0.71	0.22	0.55	0.18	0.11	0.22	0.21	0.15	0.16	0.33	0.13	0.28	4.99
2019	0.31	0.37	0.55	0.15	0.63	0.78	0.30	0.64	0.26	0.08	0.28	0.20	0.21	0.17	0.37	0.15	0.32	5.77
2020	0.36	0.41	0.57	0.16	0.65	0.78	0.38	0.65	0.27	0.13	0.30	0.21	0.24	0.17	0.38	0.17	0.33	6.16
2021	0.35	0.41	0.59	0.15	0.69	0.83	0.40	0.64	0.29	0.11	0.34	0.25	0.25	0.19	0.42	0.12	0.40	6.46
2022	0.40	0.46	0.65	0.14	0.76	0.91	0.55	0.75	0.28	0.03	0.40	0.25	0.27	0.17	0.40	0.12	0.50	7.04

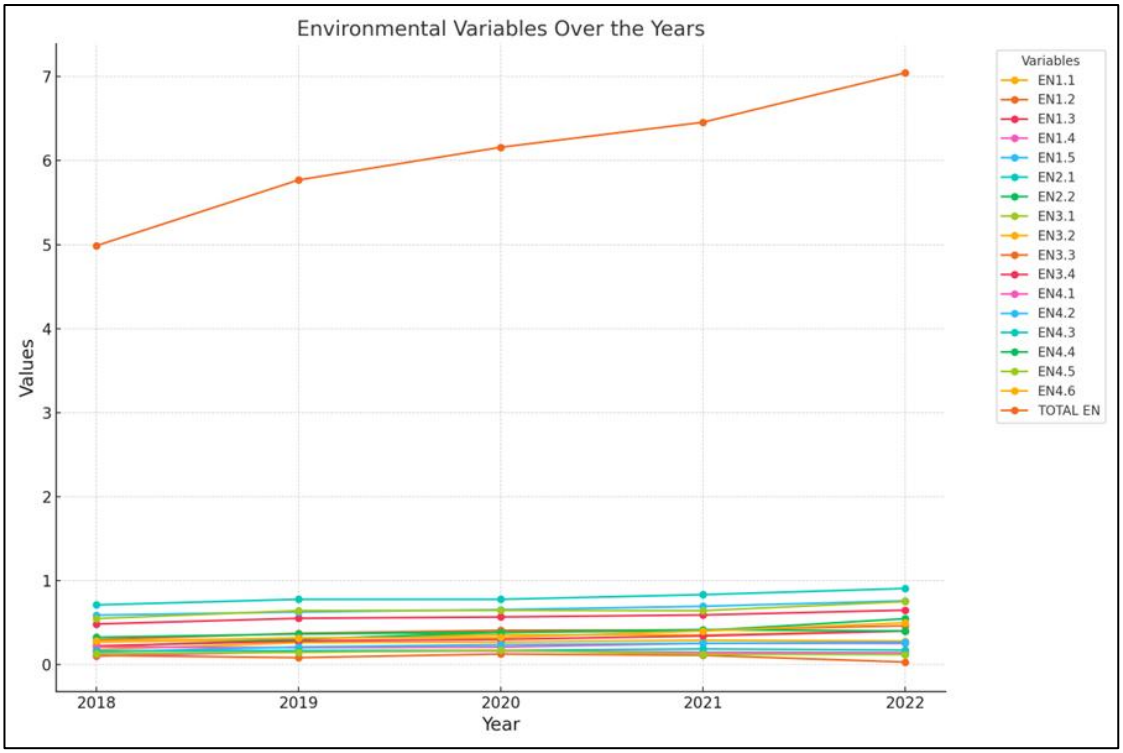

Figure 4.5 The Trends of the Environmental Indicators over the Years

4.5.1 Foundational Progressive Evolution of Environmental Sustainability Reporting (2018-2022)

Between 2018 and 2022, environmental sustainability reporting among Malaysian public-listed companies exhibited a continuous upward trajectory, reflecting increasing corporate commitment to sustainable practices.

In 2018, environmental sustainability reporting was in its foundational phase, with a TOTAL EN score of 4.99. Companies demonstrated moderate engagement in energy-saving initiatives (EN2.1) with a score of 0.71 and waste management systems (EN1.5) scoring 0.59. These scores reflected corporate efforts in reducing energy consumption and managing industrial waste effectively. However, areas such as eco-friendly product development (EN1.4) at 0.10, recycling water initiatives (EN3.2) at 0.18, and biodiversity conservation efforts like animal habitat protection (EN4.3) at 0.15 remained significantly underreported. These findings indicate that while Malaysian companies had made progress in energy conservation and waste management, they had yet to integrate comprehensive sustainability practices across all environmental indicators.

This pattern reflects the early stage of corporate environmental consciousness in Malaysia, where firms initially focused on easily measurable operational improvements rather than longer term ecological commitments such as biodiversity restoration or green innovation (Amran et al., 2022).

By 2019, the TOTAL EN score rose to 5.77, reflecting a notable improvement in sustainability reporting. Key advancements were observed in recycling waste (EN1.3), which increased to 0.55, signalling an enhanced corporate commitment to waste recycling. Energy-saving initiatives (EN2.1) improved to 0.78, while renewable energy adoption (EN2.2) reached 0.30, indicating growing investments in sustainable energy solutions. However, gaps persisted in green technology adoption (EN4.2) at 0.20 and animal habitat protection (EN4.3) at 0.21, highlighting the continued lack of emphasis on biodiversity conservation and technological advancements in sustainability.

This suggests that firms were more responsive to regulatory and stakeholder expectations regarding pollution control and energy usage, while biodiversity related reporting remained limited due to lower visibility and higher operational costs (Buallay, 2020).

Despite global disruptions caused by the COVID-19 pandemic in 2020, sustainability reporting continued to improve, with the TOTAL EN score increasing to 6.16. Recycling waste (EN1.3) saw a slight improvement to 0.57, and water-saving initiatives (EN3.1) rose to 0.65, reflecting greater corporate efforts in water conservation. However, challenges persisted in addressing air pollution (EN3.3) at 0.13 and advancing green technology (EN4.2) at 0.21, suggesting that firms prioritized more immediate environmental concerns over long-term technological solutions.

The resilience of environmental reporting during the pandemic indicates that sustainability practices had begun to mature and were no longer viewed merely as optional corporate commitments (De Villiers et al., 2021)

In 2021, Malaysian companies exhibited accelerated progress in environmental reporting, with the TOTAL EN score reaching 6.46. Significant improvements were observed in energy-saving initiatives (EN2.1), which peaked at 0.83, demonstrating a substantial shift towards energy efficiency. Additionally, water-saving initiatives (EN3.1) remained strong at 0.64, while pollution compensation initiatives (EN3.4) improved to 0.34. However, certain areas showed slower progress, including eco-friendly product initiatives (EN1.4), which decreased slightly to 0.15, and reforestation

and rehabilitation efforts (EN4.5), which only improved modestly to 0.42. These findings suggest that while firms had made significant strides in some areas, biodiversity-related sustainability practices still required greater focus.

This pattern reinforces the idea that firms improve more rapidly in indicators supported by clearer regulation and industry norms, while progress in biodiversity conservation remains hindered by limited frameworks and unclear reporting expectations (Garcia et al., 2021).

By 2022, environmental sustainability reporting reached its highest level, with the TOTAL EN score increasing to 7.04. Corporate commitment to sustainability was evident in the peak performance of several indicators. Recycling waste (EN1.3) rose to 0.65, energy-saving initiatives (EN2.1) and renewable energy (EN2.2) reached their highest scores at 0.91 and 0.55, respectively, highlighting increased investments in sustainable energy. Water conservation also advanced, with water-saving initiatives (EN3.1) peaking at 0.75. Greenhouse gas emission control (EN4.6) demonstrated notable progress at 0.50, showcasing corporate efforts to reduce environmental impact. Despite this overall growth, biodiversity conservation indicators such as animal habitat protection (EN4.3) and reforestation (EN4.5) remained relatively low at 0.17 and 0.40, respectively, indicating the need for more balanced sustainability efforts.

The significant improvements in energy and water related indicators illustrate corporate responsiveness to measurable operational efficiencies and cost savings, while the limited progress in biodiversity suggests that firms still face capability, resource, and strategic challenges in implementing ecosystem-based sustainability initiatives.

Overall, the trend analysis demonstrates a consistent upward movement across most environmental indicators, confirming that environmental sustainability reporting has become increasingly embedded within Malaysian corporate practices during the five-year period.

4.6 Descriptive Analysis of Social Reporting Among Malaysian Public-Listed Companies from 2018 to 2022

4.6.1 Introduction

This section provides a detailed descriptive analysis of the level of social sustainability reporting among Malaysian public-listed companies for the years 2018 to

2022. It addresses objective 1 of the thesis, which aims to identify the level of sustainability reporting among these companies. The analysis examines the social sustainability indicators (SO1 to SO4) and their sub-indicators across the five years, highlighting trends, key changes, and areas of focus. The findings contextualize these trends within the broader sustainability reporting framework and their implications for corporate social responsibility (CSR) practices in Malaysia.

This analysis also reflects how Malaysian companies have strengthened their social disclosure practices in response to evolving stakeholder expectations, regulatory strengthening, and global shifts toward more responsible business conduct (De Villiers et al., 2021)

4.6.2 Progressive Growth of Social Sustainability Reporting Among Malaysian Public-Listed Companies from 2018 to 2022

The analysis of social sustainability reporting among Malaysian public-listed companies from 2018 to 2022 reveals a consistent upward trend, highlighting improvements in employment policies, human rights, community engagement, and market responsibility. As illustrated in Table 4.5 and Figure 4.6, many social sustainability indicators have shown steady progress over the years, reflecting the increasing commitment of firms to corporate social responsibility (CSR) initiatives. Key indicators such as SO1.1 (employment practices), SO1.4 (human rights policies), and SO2.2 (community investment) have demonstrated noticeable growth, suggesting enhanced corporate focus on social welfare, workforce well-being, and ethical business practices.

The overall improvement in social sustainability reporting reflects stronger expectations from regulators such as Bursa Malaysia, increasing investor scrutiny of social risks, and greater societal emphasis on workplace fairness, employee safety, and community contribution (De et al., 2021)

The general upward path in social sustainability reporting can be attributed to heightened regulatory requirements, evolving investor expectations, and broader awareness of social governance issues within corporate frameworks. Notably, while most variables have improved, a few indicators, such as SO4.4, exhibit fluctuations, indicating varying levels of corporate responsiveness to specific social concerns.

Table 4.5

Social Sustainability Indicators over the Years (2018-2022)

Year	SO1.1	SO1.2	SO1.3	SO1.4	SO1.5	SO1.6	SO1.7	SO1.8	SO2.1	SO2.2	SO2.3	SO2.4	SO3.1	SO3.2	SO4.1	SO4.2	SO4.3	SO4.4
2018	0.67	0.61	0.50	0.83	0.46	0.28	0.82	0.17	0.35	0.52	0.27	0.10	0.78	0.70	0.31	0.20	0.74	0.24
2019	0.74	0.74	0.58	0.90	0.54	0.41	0.86	0.19	0.43	0.58	0.29	0.13	0.78	0.73	0.33	0.22	0.82	0.24
2020	0.81	0.75	0.63	0.88	0.61	0.45	0.85	0.19	0.43	0.65	0.30	0.10	0.83	0.78	0.35	0.21	0.83	0.26
2021	0.83	0.80	0.67	0.90	0.63	0.47	0.87	0.18	0.50	0.67	0.38	0.12	0.83	0.83	0.33	0.24	0.87	0.28
2022	0.89	0.86	0.76	0.93	0.71	0.54	0.91	0.16	0.59	0.76	0.40	0.08	0.88	0.88	0.35	0.18	0.88	0.27

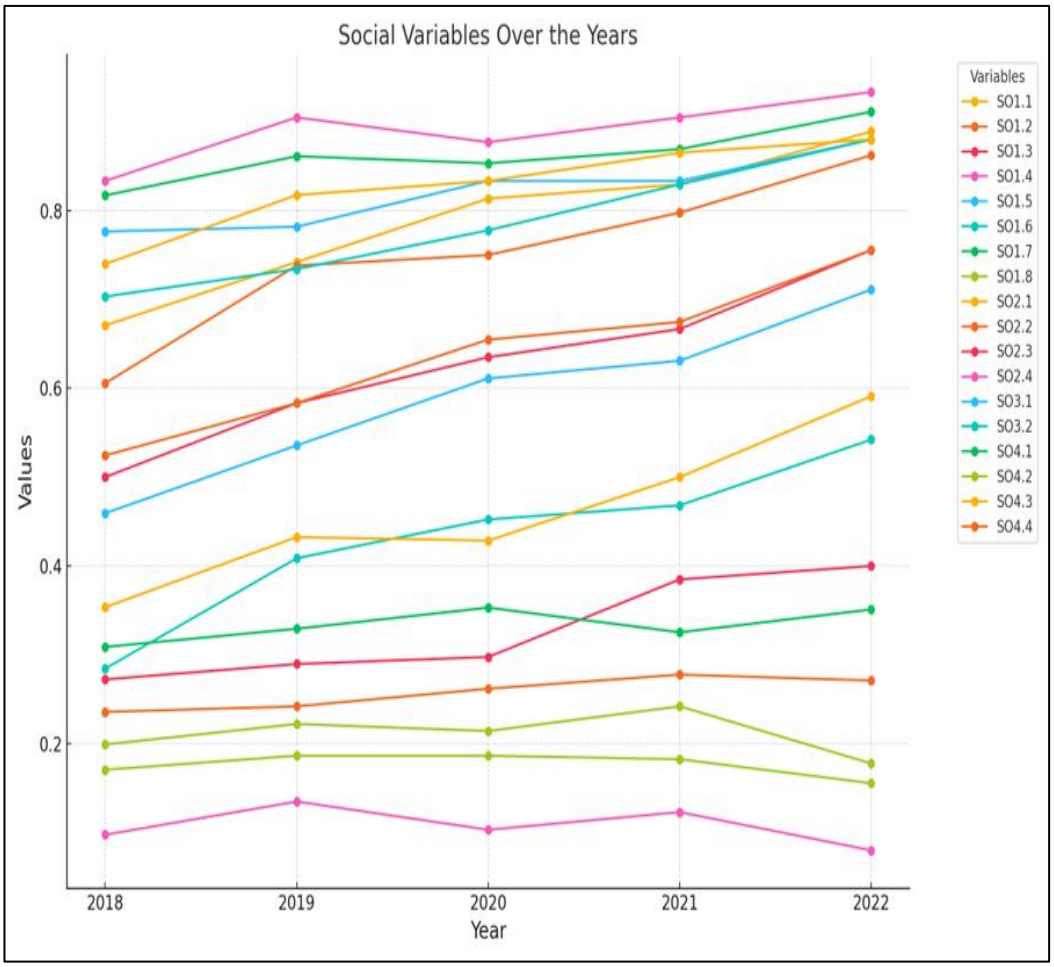

Figure 4.6 The Trends of The Social Variables Over 2018-2022

The analysis of social sustainability reporting among Malaysian public-listed companies from 2018 to 2022 reveals a consistent upward trend, highlighting improvements in employment policies, human rights, community engagement, and market responsibility.

In 2018, social sustainability reporting was in its foundational phase, with a total social score reflecting an emerging focus on employee welfare and community initiatives. Employment-related indicators such as occupational health and safety (SO1.4) at 0.83 and training and education (SO1.7) at 0.82 showcased corporate commitment to workforce development. However, human rights policies (SO2.1) at 0.35 and marketplace initiatives (SO4.1) at 0.31 remained underdeveloped, pointing to gaps in ethical business practices.

These patterns suggest that early reporting efforts were concentrated on internal workforce issues, which were easier to document and more aligned with existing regulatory expectations compared to marketplace responsibility reporting (De et al., 2021).

By 2019, companies expanded their reporting efforts, leading to improvements in gender equality (SO1.2) at 0.74 and human rights policies (SO2.1) at 0.43. Community engagement indicators such as charitable efforts (SO3.2) increased to 0.73, reflecting stronger corporate involvement in social responsibility initiatives. Despite these advancements, market responsibility indicators showed only modest growth, with marketplace initiatives (SO4.1) improving slightly to 0.33, signalling a need for greater attention in this area.

These incremental improvements suggest increasing sensitivity to stakeholder concerns, especially in areas such as diversity, human rights, and community development, while marketplace responsibility continued to lag due to weaker enforcement and limited corporate prioritisation (García et al., 2021).

In 2020, despite the challenges of the COVID nineteen pandemic, social sustainability reporting remained resilient. Companies maintained their commitment to employee training SO1.7 at 0.85 and gender equality SO1.3 improved to 0.63. Community initiatives SO3.1 increased to 0.83 as businesses expanded their social contributions to mitigate pandemic related hardships. Market responsibility, however, showed only slight progress, with product responsibility SO4.2 improving to 0.21, indicating a slow but steady shift toward ethical corporate behaviour.

The continued strength and stability of social sustainability reporting during this crisis period indicates that social sustainability had become more embedded in corporate practice and was increasingly viewed as essential for maintaining stakeholder confidence during uncertain times (De Villiers et al., 2021).

The year 2021 demonstrated sustained growth in reporting practices, with gender equality SO1.2 peaking at 0.80 and occupational health and safety SO1.4 remaining at 0.90. Corporate engagement in charitable efforts SO3.2 also grew to 0.83, reinforcing the trend of increased community involvement. Marketplace ethical practices SO4.4 saw improvement at 0.28, reflecting growing corporate awareness of responsible business conduct.

The improvements observed in 2021 were likely influenced by both post pandemic recovery demands and the growing maturity of sustainability frameworks adopted by Malaysian companies (Amran et al., 2022).

By 2022, social sustainability reporting reached its peak, with significant improvements across all key indicators. Employment policies SO1.1 reached 0.89, while training and education SO1.7 peaked at 0.91, demonstrating the highest level of commitment to workforce development. Non-discrimination SO2.2 improved to 0.76, highlighting strengthened corporate ethics. Community engagement achieved its highest levels, with community initiatives SO3.1 and charitable efforts SO3.2 both scoring 0.88. Although market responsibility continued to lag other areas, marketplace initiatives SO4.1 rose to 0.35, reflecting incremental progress in ethical business practices.

The peak levels observed in 2022 indicate growing corporate alignment with social sustainability expectations, possibly driven by higher investor pressure, increased global emphasis on social governance issues, and strengthened Bursa Malaysia sustainability reporting requirements (KPMG, 2022).

The five-year analysis showcases the evolution of social sustainability reporting, with substantial progress in employee welfare, diversity, and community engagement. However, market responsibility and ethical business practices require further attention to achieve a balanced and comprehensive approach to corporate social sustainability.

Overall, the upward trends demonstrate that Malaysian companies have progressively integrated social sustainability into their corporate strategies, although future improvements should focus on enhancing ethical marketplace behaviour and addressing persistent gaps in social sustainability reporting (Garcia-Sanchez et al., 2021).

4.7 Comprehensive Analysis of The Level of Sustainability Reporting

4.7.1 Introduction

This section presents a comprehensive analysis of the level of sustainability reporting among Malaysian public-listed companies, aligning with objective 1 of the thesis: to identify the level of sustainability reporting over the years 2018 to 2022. The data for this analysis include aggregated scores for sustainability reporting levels across

these years, as summarized in Table 4.1 and illustrated in Figure 4.1. Trends, year-on-year growth, and potential implications are discussed in detail, supported by contextual interpretations of the observed results.

This section also integrates trend explanations and the potential drivers behind the incremental changes.

Table 4.6

Total Sustainability Reporting Levels (2018–2022)

Year	Grand Total
2018	16.207311
2019	18.373033
2020	19.27379
2021	20.17859
2022	21.51111

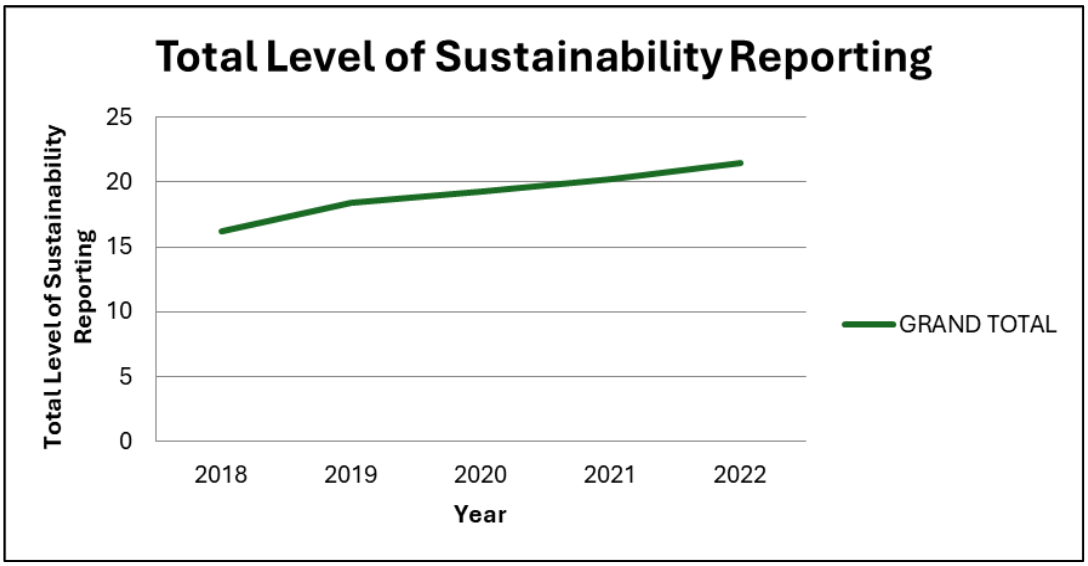

Figure 4.7 Trends in Sustainability Reporting Levels (2018–2022)

4.7.2 Descriptive Evolution and Key Drivers of Sustainability Reporting Levels in Malaysian Public Listed Companies (2008 – 2022)

The period from 2018 to 2022 witnessed a steady increase in sustainability reporting among Malaysian public-listed companies, driven by regulatory requirements, market expectations, and evolving corporate strategies. In 2018, the total level of sustainability reporting was recorded at 16.21, establishing the baseline for Malaysian firms. At this stage, sustainability reporting was gaining momentum, likely driven by emerging regulatory requirements and initial awareness of economics, environmental and social) factors. However, the moderate score suggests that firms were still in the early stages of structured sustainability practices.

In 2019, the level of sustainability reporting rose to 18.37, marking an increase of 2.16 points (approximately 13.3% growth). This improvement reflects a significant shift in corporate behaviour as companies responded to increasing stakeholder demands for transparency and accountability. Key factors during this period included stricter sustainability reporting guidelines from Bursa Malaysia and enhanced public awareness of sustainability issues. This trend highlighted the growing adoption of reporting standards such as the Global Reporting Initiative (GRI), though gaps in consistency and depth of reporting likely persisted.

The notable increase in 2019 also suggests the early effects of companies aligning themselves with international reporting frameworks such as the Global Reporting Initiative, as well as greater investor sensitivity toward sustainability indicators (De et al., 2021)

By 2020, sustainability reporting further increased to 19.27, with a more modest year-on-year growth of 0.9 points (4.9%). The deceleration could be attributed to disruptions caused by the COVID-19 pandemic, which redirected corporate resources toward immediate survival rather than strategic ESG initiatives. Nonetheless, the continued increase suggests resilience among Malaysian firms in upholding sustainability practices even amidst global uncertainty. The pandemic may have also highlighted the importance of sustainable business models, prompting firms to integrate ESG considerations into their recovery strategies.

The pandemic period also highlighted the importance of sustainability preparedness, prompting firms to integrate environmental, social, and economic considerations into recovery and continuity strategies (Amran et al., 2022).

In 2021, sustainability reporting levels reached 20.18, representing an increase of 0.91 points (4.7%). This steady growth highlights the maturing landscape of sustainability reporting in Malaysia, characterized by improved alignment with international standards and greater sophistication in reporting practices. Government-led initiatives, such as the Sustainability Reporting Roadmap by Bursa Malaysia, likely played a pivotal role in encouraging compliance and enhancing the quality of reporting. Additionally, the rise of investor activism and pressure from global supply chains may have contributed to this progress.

This period also reflects the growing influence of sustainability focused investment trends and supply chain pressures, where multinational buyers increasingly require transparent sustainability disclosures from Malaysian firms (Amran et al., 2022.)

In 2022, the level of sustainability reporting peaked at 21.51, marking a growth of 1.33 points which is 6.6% compared to the previous year. This consistent improvement highlights the entrenched nature of sustainability practices among Malaysian public listed companies. By this stage, sustainability reporting had transitioned from being a regulatory obligation to a strategic priority, with firms leveraging sustainability reporting to attract investment, strengthen reputations, and gain competitive advantages.

The increasing visibility of global climate commitments heightened public scrutiny, and the integration of sustainability criteria into financing instruments such as sustainability linked loans may also explain this peak (De et al., 2021).

The descriptive analysis reveals a consistent upward trend in sustainability reporting levels from 2018 to 2022, with an average annual growth rate of approximately 6.6%. This trajectory indicates that Malaysian public listed companies are progressively enhancing sustainability reporting, driven by a combination of regulatory, market, and societal factors. The sharp growth observed between 2018 and 2019 highlights the impact of regulatory frameworks such as Bursa Malaysia's push for sustainability reporting.

The use of one-way ANOVA to test year to year differences supports the finding that the increases across the five years are statistically significant, confirming that sustainability reporting improved consistently rather than by random variation. (Wooldridge, 2020).

Meanwhile, the steady but slower growth during 2020 and 2021 reflects the resilience of sustainability practices amidst challenges posed by the pandemic. The peak in 2022 signifies a culmination of efforts toward embedding sustainability as a core business function.

Regulatory mandates, particularly those by Bursa Malaysia requiring sustainability statements in annual reports, have been a significant catalyst for structured sustainability reporting among Malaysian firms. These regulations compelled companies to adopt comprehensive frameworks to ensure transparency and accountability. Growing stakeholder expectations from investors, customers, and interest groups further strengthened the focus on sustainability.

Global alignment with international sustainability standards such as the Global Reporting Initiative, the Sustainability Accounting Standards Board, and the Task Force on Climate Related Financial Disclosures has enhanced the credibility and comparability of Malaysian firms' disclosures. Companies increasingly recognized sustainability reporting as a strategic tool to differentiate themselves, attract investment, and strengthen long term value creation.

Despite progress, challenges remain. Gaps in the depth and consistency of disclosures persist, with some firms prioritizing compliance rather than strategic implementation.

Future sustainability efforts can be strengthened by improving holistic integration across economic, environmental, and social themes, particularly in areas where year to year progress remains uneven (De et al., 2021).

These enhancements will ensure long term effectiveness and impact in sustainability practices.

4.8 Yearly Differences in Sustainability Reporting: One-Way ANOVA

To examine whether sustainability reporting varied significantly over the five-year period, a one-way Analysis of Variance (ANOVA) was conducted on Total

Sustainability Reporting (TSRREAL), Economic Reporting (ECREAL), Environmental Reporting (ENREAL), and Social Reporting (SOCREAL). This analysis directly supports the research objective that focuses on identifying differences in sustainability reporting across the years 2018 to 2022. Tukey HSD post hoc tests were subsequently performed to determine the specific year-to-year variations. The results of these tests are interpreted in relation to existing literature on the evolution of sustainability reporting.

4.8.1 ANOVA Results

The ANOVA outcomes (Table 4.2) indicate statistically significant differences in sustainability reporting scores across the five-year period for TSRREAL, ECREAL, ENREAL and SOCREAL dimensions. This suggests that reporting practices among Malaysian public listed companies improved progressively from 2018 to 2022. (García, 2020)

The ANOVA indicates that sustainability reporting increased significantly throughout the study period. The results for TSRREAL reflect noticeable year-to-year improvement, showing that firms steadily strengthened the comprehensiveness of their sustainability reporting. Economic sustainability reporting patterns reveal significant differences across the period, confirming enhanced financial transparency and governance-related reporting. Environmental sustainability reporting also improved, particularly in later years, suggesting a growing corporate emphasis on environmental stewardship. Social sustainability reporting further demonstrated meaningful increases, particularly in areas involving community engagement, labour practices, and employee welfare (Buallay, 2020)

These trends highlight a consistent pattern of improvement, aligning with earlier findings that sustainability reporting becomes progressively more structured as regulatory frameworks mature, and stakeholder expectations rise. The significance of yearly differences also confirms that Malaysian organisations have been increasingly responsive to sustainability guidelines introduced by Bursa Malaysia and international reporting frameworks (KPMG, 2022).

Table 4.7
ANOVA Results for Sustainability Reporting Scores (2018-2022)

Dependent Variable	Source	Sum of Squares	df	Mean Square	F	Sig.
TSRREAL	Between Groups	4,498.14	4	1,124.54	23.42	<.001
	Within Groups	60,268.85	1,255	48.02		
	Total	64,766.99	1,259			
ECREAL	Between Groups	106.63	4	26.66	14.02	<.001
	Within Groups	2,386.31	1,255	1.90		
	Total	2,492.94	1,259			
ENREAL	Between Groups	765.92	4	191.48	15.16	<.001
	Within Groups	15,850.06	1,255	12.63		
	Total	16,615.97	1,259			
SOCREAL	Between Groups	862.23	4	215.56	21.56	<.001
	Within Groups	12,547.54	1,255	10.00		
	Total	13,409.76	1,259			

4.8.2 Tukey HSD Post Hoc Analysis

Following the significant ANOVA results, Tukey HSD post hoc tests were conducted to examine specific year-to-year differences. The results indicate that 2022 reports substantially higher sustainability scores than all preceding years for each reporting dimension. The earliest year, 2018, consistently records the lowest mean scores, reflecting the early stages of sustainability reporting adoption and the relatively limited extent of sustainability reporting during that period. Intermediate years display gradual improvement, although several adjacent years share similar reporting levels, suggesting a steady rather than abrupt progression in reporting practices.

The results show that sustainability reporting underwent consistent development throughout the five-year timeframe, with later years reflecting clear maturity in

sustainability reporting structures. The sharp increase observed in 2022 may relate to the broader institutional push toward mandatory sustainability reporting, heightened investor awareness, and global pressures associated with economic, environmental and social expectations (KPMG, 2022).

4.8.3 Discussion of ANOVA Result

The results reveal that sustainability reporting improved significantly between 2018 and 2022. Total sustainability reporting demonstrates a consistent upward trend, indicating greater transparency and alignment with international frameworks. This finding reflects earlier observations by Wang (2021), who noted that reporting systems become more sophisticated as organisations institutionalise performance-driven reporting processes. Economic sustainability reporting also shows substantial progress and corresponds with stakeholder theory, which underscores the value of economic transparency for reducing information asymmetry and strengthening investor confidence (Buallay, 2020)

Environmental sustainability reporting improvements are particularly evident in later years, coinciding with increased emphasis on climate-related risks and the adoption of internationally recognised frameworks such as the Task Force on Climate-related Financial Disclosures (TCFD). This pattern is consistent with recent studies showing that heightened regulatory expectations and public scrutiny encourage firms to strengthen the depth and consistency of environmental sustainability reporting, particularly in relation to climate risk exposure and environmental performance indicators (De, 2021). Social sustainability reporting also demonstrates notable growth, reflecting greater organisational attention to employee welfare, workforce diversity, and community engagement. These developments align with global evidence indicating that social sustainability reporting tends to expand during periods of regulatory enhancement and increased stakeholder pressure, as firms respond to societal expectations and legitimacy concerns (García, 2023)

The pattern emerging from the five-year trend supports established theoretical perspectives suggesting that organisations progressively deepen their sustainability-related reporting as institutional, regulatory, and market pressures intensify. The consistent improvement observed also reflects the growing maturity of sustainability

reporting practices among Malaysian listed firms, as companies increasingly internalise sustainability requirements and align their reporting with formal guidelines and stakeholder expectations (García, 2022)

The analyses confirm that sustainability reporting among Malaysian public listed companies improved significantly across TSRREAL, ECREAL, ENREAL and SOCREAL dimensions over the five-year period. Tukey HSD results show that 2022 represents the highest level of reporting maturity, while 2018 consistently reflects the earliest stage of development. The findings illustrate that sustainability reporting strengthened steadily in response to regulatory guidance, organisational learning, and increased stakeholder awareness. These results complement international research showing that sustainability reporting becomes more extensive as firms advance toward more structured and transparent reporting practices. (KPMG,2022)

4.9 Conclusion

This chapter examined the level and changes in sustainability reporting among Malaysian public listed companies over the 2018 to 2022 period. Using descriptive statistics, trend analysis, and comparative evaluation across economic, environmental, and social dimensions, the findings provide clear evidence of continuous improvement in sustainability reporting practices throughout the five-year timeframe. The results indicate that sustainability reporting in Malaysia has progressed from a largely compliance-oriented activity to a more structured and increasingly integrated component of corporate reporting.

Across the three sustainability reporting dimensions, social sustainability reporting consistently recorded the highest levels, reflecting strong corporate emphasis on employee welfare, labour practices, diversity, and community engagement. Environmental sustainability reporting also showed notable improvement, particularly in areas related to energy efficiency, resource management, and environmental initiatives, although reporting relating to biodiversity and advanced green technologies remained relatively limited. Economic sustainability reporting demonstrated steady growth over time, with improvements in reporting related to employee benefits, community investment, and infrastructure development, while transparency in certain economic distribution aspects continued to lag.

The aggregated sustainability reporting scores TSRREAL, ECREAL, ENREAL, and SOCREAL further confirmed the upward trend observed across the study period. The one-way ANOVA analysis revealed statistically significant differences in mean sustainability reporting scores across the five years, indicating that changes in reporting levels were systematic rather than random. These results demonstrate that sustainability reporting practices strengthened progressively over time, with later years reflecting higher levels of reporting maturity compared to earlier periods.

Importantly, the observed strengthening of sustainability reporting occurred alongside variations in firm value indicators such as market capitalisation, book value, and net income, suggesting a potential association between sustainability reporting and firm value. While this chapter does not test causal or relational effects, the descriptive and comparative evidence provides an empirical basis for examining whether higher levels of sustainability reporting are positively related to firm value, as proposed in Hypothesis 1.

Overall, the findings of Chapter 4 fulfil Objective 1, which is to identify the level of sustainability reporting of Malaysian public-listed companies. The chapter establishes a clear empirical baseline on sustainability reporting practices in Malaysia and sets the stage for the formal hypothesis testing in the following chapter, where the relationship between sustainability reporting and firm value is empirically examined.

4.10 Summary

This chapter analysed sustainability reporting among Malaysian public-listed companies from 2018 to 2022 using descriptive statistics, trend analysis, and supporting diagnostics. Key financial indicators, including market capitalisation, book value, and net income, were first examined to provide the financial context within which sustainability reporting was reported.

The chapter then reviewed sustainability reporting across economic, environmental, and social dimensions. Economic reporting highlighted employee-related reporting and infrastructure investment, while environmental reporting showed greater emphasis on energy and water-related initiatives. Social sustainability reporting

recorded the most consistent levels, reflecting reporting related to employment practices and community engagement.

The aggregated sustainability reporting scores and one-way ANOVA results indicated statistically significant variation in reporting levels across the study period. Overall, this chapter fulfils Objective 1 by identifying the level of sustainability reporting of Malaysian public-listed companies and provides the empirical basis for subsequent regression and moderation analyses.

CHAPTER 5
ANALYSIS OF FINDINGS 2

5.1 Introduction

The previous chapter discussed the first objective of the study, which is to identify the level of sustainability reporting of Malaysian public listed companies. This chapter looks at the results and analysis that go along with research objectives 2, 3, and 4. These all have the same goal: to find out the relationships between sustainability reporting, firm value, and the role of leadership competencies in Malaysian public-listed companies. This chapter specifically looks at the direct link between sustainability reporting and firm value (objective 2). It also looks at how full reporting of the economic, environmental, and social aspects of sustainability affects the firm value of companies (objective 3). According to Objective 4, it also investigates how leadership competencies affect these relationships, showing how good leadership can either strengthen or weaken the impact of sustainability practices on firm value.

In addressing these objectives, this chapter employs a series of regression models that explain only a modest proportion of the variation in firm value, with R squared values in the low range. Rather than viewing this as a weakness of the analysis, the chapter explicitly acknowledges that firm value is influenced by many other financial, strategic, and market related factors that are not included in the models. The empirical results are therefore interpreted as providing incremental explanatory power and as offering evidence of how far sustainability reporting and leadership characteristics contribute to firm value, over and above these omitted influences.

The analysis also reveals that several leaderships related moderating variables, such as chief executive age, tenure, and experience, do not show statistically significant effects in many of the models. These non-significant findings are not treated as mere statistical noise. Instead, the discussion connects them to possible theoretical explanations, including the institutional context of Malaysian listed firms, the collective nature of decision making in large organisations, and the potential dilution of individual leadership influence within formal governance structures.

At the same time, some interaction terms, including those involving sustainability reporting and leadership gender, exhibit statistically significant but negative coefficients. While this outcome may appear counterintuitive if leadership diversity is assumed to uniformly enhance firm value, such findings can be interpreted through the lenses of Stakeholder Theory, Stewardship Theory, and the Triple Bottom Line framework. From a stakeholder perspective, differing leadership attributes may shape how competing stakeholder interests are prioritised, potentially influencing market perceptions of sustainability efforts. Stewardship Theory suggests that leadership characteristics may condition the extent to which sustainability initiatives are aligned with long-term organisational objectives rather than short-term market expectations. Similarly, the Triple Bottom Line framework highlights that an emphasis on environmental and social outcomes may not always translate immediately into financial value, particularly when trade-offs arise among economic, environmental, and social objectives. Accordingly, this chapter places particular emphasis on examining how leadership competencies may constrain, redirect, or condition the manner in which sustainability reporting is reflected in firm value.

The empirical results are based on an aggregate sample of firms across multiple sectors, without separate estimations by industry group. This design reflects the overall research scope but also implies that potential sectoral differences in the importance of sustainability reporting, such as between energy intensive industries and service-based sectors, are not fully captured in the modelling. This limitation is explicitly recognised in the discussion, and the findings are interpreted as average effects at the market level rather than as sector specific conclusions.

By leveraging robust statistical models and analysing data from Malaysian publicly listed companies, this chapter seeks to provide a nuanced understanding of how sustainability initiatives are perceived and valued by stakeholders while highlighting the pivotal role of leadership in aligning sustainability practices with broader organisational goals. The integration of theory-based interpretation, recognition of model limitations, and careful treatment of both significant and non-significant results ensures that the findings contribute meaningfully to the wider literature on sustainability reporting, firm value, and leadership in emerging markets.

5.2 Prerequisite Before Regression Analysis

Before conducting the Ordinary Least Squares (OLS) regression, all standard diagnostic assumptions were examined to ensure the reliability and validity of the statistical results. The first assumption, linearity, requires the relationship between each predictor and the dependent variable to be linear. This assumption was evaluated in SPSS by plotting Market Capitalisation (MCAP) against the model's standardized predicted values. The scatterplot demonstrated an approximately random distribution of points around the horizontal axis, with no visible curvature, indicating that the linearity assumption was reasonably satisfied (Field, 2018; Hair et al., 2019).

The same scatterplot was used to assess homoscedasticity, which requires constant variance of residuals across predicted values. The residuals did not exhibit a systematic pattern of widening or narrowing, suggesting that the variance was relatively stable across the fitted range (Pallant, 2020).

Residual normality was assessed using the Shapiro Wilk test in SPSS. The test indicated a statistically significant deviation from normality ($p < 0.001$). A stem-and-leaf plot further illustrated that residuals were tightly clustered around 0 with extended tails, producing a leptokurtic distribution. Although non-normality can pose concerns in small samples, the large sample size used in this study ($N = 1,250$) reduces such risks. According to the Central Limit Theorem, OLS estimators remain unbiased in large samples, and their sampling distributions approach normality even when residuals are non-normal (Tabachnick et al., 2019). Prior research further confirms that t-tests and regression inferences remain robust to deviations from residual normality when sample sizes are sufficiently large (Hayes, 2017). Thus, the observed non-normality did not invalidate the regression results, and no transformation was required.

Multicollinearity was assessed using the correlation matrix and the Variance Inflation Factor (VIF) values generated in SPSS. All pairwise correlations among predictors were within acceptable ranges, and VIF values were below the commonly accepted threshold of 5, indicating the absence of severe multicollinearity (Hair et al., 2019).

Taken together, the diagnostic tests indicated that the assumptions of OLS regression were sufficiently met. Although residual normality departed from the ideal distribution, the large sample size ensured robustness of the estimators. Overall, the

diagnostic assessment supports the use of OLS regression for analysing the relationship between sustainability reporting and firm value.

5.3 Correlation Analysis

Correlation analysis is a fundamental statistical technique used to examine the strength and direction of relationships between variables. It helps clarify how key financial and sustainability metrics relate to one another. This section analyses the simulated correlation matrix (Table 5.1), with emphasis on the associations between market capitalisation (MCAP), book value (BV), net income (NI), and the different dimensions of sustainability reporting.

Table 5.1
Correlation of MCAP, BV, NI, TSRREAL, ENREAL, ECREAL AND SOCREAL

		MCAP	BV	NI	TSRREAL	ECREAL	ENREAL
BV	Pearson Correlation	0.733**					
	Sig. (2-tailed)	0.001					
	N	1,260					
NI	Pearson Correlation	0.731**	0.705**				
	Sig. (2-tailed)	0.001	0.001				
	N	1,260	1,260				
TSRREAL	Pearson Correlation	0.197**	0.194**	0.136**			
	Sig. (2-tailed)	0.001	0.001	0.001			
	N	1,260	1,260	1,260			
ECREAL	Pearson Correlation	0.109**	0.082**	0.041	0.761**		
	Sig. (2-tailed)	0.001	0.004*	0.145	0.001		
	N	1,260	1,260	1,260	1,260		
ENREAL	Pearson Correlation	0.223**	0.234**	0.169**	0.898**	0.607**	
	Sig. (2-tailed)	0.001	0.001	0.001	0.001	0.001	
	N	1,260	1,260	1,260	1,260	1,260	
SOCREAL	Pearson Correlation	0.138**	0.130**	0.093**	0.870**	0.567**	0.599**
	Sig. (2-tailed)	0.001	0.001	0.001	0.001	0.001	0.001
	N	1,260	1,260	1,260	1,260	1,260	1,260

** correlation is significant at the 0.01 level (2-tailed)

* correlation is significant at 0.05 level (2-tailed)

Table 5.1 presents Pearson correlation coefficients along with their significance levels, providing a comprehensive overview of the relationships across variables. Statistically significant correlations at the 0.01 and 0.05 thresholds indicate meaningful associations that merit further interpretation. Higher positive correlations imply stronger direct associations, whereas weak or negative correlations signal limited or inverse relationships.

In line with the theoretical expectations of signalling theory and legitimacy theory, the analysis identifies how sustainability disclosures may shape stakeholder perceptions and influence firm value. This section therefore sets the foundation for interpreting how sustainability practices relate to market valuation (MCAP), and how book value and net income position themselves alongside sustainability indicators in predicting financial outcomes.

5.3.1 Analysis of Correlation between Sustainability Reporting, Firm Value, Book Value and Net Income

The correlation matrix for the period 2018–2022 provides valuable insights into the correlation between market capitalisation (MCAP), book value (BV), net income (NI), and various dimensions of sustainability reporting (TSRREAL, ECREAL, ENREAL, and SOCREAL).

Book Value (BV) demonstrates a strong positive correlation with MCAP (0.73318), indicating that higher book value is associated with higher firm value. This is consistent with the understanding that book value, as a measure of equity, plays a significant role in determining market capitalisation.

Net Income (NI) also shows a strong correlation with MCAP (0.731), reflecting the importance of profitability in enhancing firm value. The positive correlation between NI and BV (0.705) further supports the idea that profitable firms tend to have higher equity and, consequently, greater market value.

Total Sustainability Reporting (TSRREAL) has a positive correlation with MCAP (0.197), BV (0.194), and NI (0.136). Although these correlations are relatively modest, their statistical significance indicates that sustainability reporting contributes to firm value and financial performance, even if the effect size is not large. This modest

magnitude is consistent with prior research suggesting that sustainability disclosures function primarily as a complementary rather than primary determinant of firm value.

Economic sustainability reporting (ECREAL) shows a strong correlation with TSRREAL (0.761), reflecting its centrality in the overall sustainability reporting framework. The weaker direct correlations between ECREAL and MCAP (0.109) and between ECREAL and BV (0.082), though statistically significant, imply that the economic dimension alone exerts a limited individual influence on market valuations. This outcome is consistent with Stakeholder Theory, Stewardship Theory, and the Triple Bottom Line framework, which suggest that economic sustainability reporting often reiterates information already captured in traditional financial reports. As a result, economic reporting may provide limited additional value to stakeholders and investors when compared with environmental and social reporting, which address broader non-financial expectations and long-term stewardship responsibilities (De et al., 2021).

Environmental sustainability reporting (ENREAL) demonstrates the strongest association with TSRREAL (0.898), confirming its prominence within sustainability disclosures. The positive correlations between ENREAL and MCAP (0.223) and between ENREAL and BV (0.234) suggest that environmental initiatives may be increasingly recognised by investors, consistent with global trends emphasizing environmental responsibility.

Social sustainability reporting (SOCREAL) demonstrates a strong association with total sustainability reporting and meaningful relationships with both environmental and economic reporting dimensions. Its positive correlation with market capitalisation indicates that social initiatives contribute to firm value, although the effect is smaller than that of other sustainability components. From the perspective of Stakeholder Theory, this pattern reflects the importance of addressing the interests of key stakeholder groups such as employees, local communities, and consumers. Firms that consistently report on social practices are more likely to build legitimacy, trust, and stakeholder support, which can translate into favourable market perceptions and enhanced firm value (Freeman, 2020).

Overall, the correlation results highlight that traditional financial metrics (BV and NI) continue to play a dominant role in determining firm value, while sustainability reporting contributes incremental value, particularly through environmental and social

dimensions. These patterns provide an important foundation for interpreting the regression analyses in the subsequent sections.

5.4 Regression Analysis

Regression analysis serves as an essential analytical technique in this study to examine how firm value, measured through market capitalisation, responds to changes in key financial variables. The Ohlson Basic Model, introduced by Ohlson in 1995, provides the theoretical foundation for this analysis. According to the model, firm value can be explained primarily through two fundamental accounting variables, namely book value of equity and net income. In the present study, these variables act as independent predictors, while market capitalisation represents the dependent variable. The analysis covers a five-year period from 2018 until 2022, enabling a comprehensive evaluation of how these relationships evolve across differing economic contexts.

The Ordinary Least Squares estimation technique is employed to derive the regression coefficients for each year as well as for the combined period. This method allows for the assessment of the magnitude, direction, and statistical significance of the relationships among the variables. T-statistics are applied to correct for heteroscedasticity, ensuring the reliability of statistical inference, while the Variance Inflation Factor is utilised to detect any multicollinearity concerns.

This analytical approach performs two critical functions. First, it highlights the influence of financial performance metrics on firm value and demonstrates the relevance of established financial valuation theories in the Malaysian market context. Second, it provides a necessary benchmark for evaluating whether non-financial variables, such as sustainability reporting practices and leadership competencies, enhance the explanatory power of the baseline financial model. By establishing the strength of traditional accounting-based predictors, subsequent model extensions can be meaningfully assessed.

By initially anchoring the analysis in traditional accounting-based valuation measures, this research illustrates how financial fundamentals remain central to investors' assessment of firm performance. Book value reflects the cumulative financial strength of the firm, while net income captures its profitability and operational efficiency. The interaction between these indicators provides insight into both the long-

term stability and short-term earnings capability that investors evaluate when determining firm value. The regression outputs displayed in Table 5.2 provide evidence on how these relationships develop year by year, offering a detailed picture of valuation behaviour among Malaysian public listed companies.

The findings also clarify the baseline explanatory contribution of book value and net income, which is essential before incorporating sustainability and leadership variables. This structure ensures that any incremental explanatory power from sustainability practices or moderation effects can be properly interpreted relative to the traditional financial drivers. The explanatory strength reflected through coefficients and significance levels therefore guides the direction of subsequent analysis and hypothesis testing.

In summary, the regression analysis based on the Ohlson Basic Model establishes a solid empirical grounding for the study. It demonstrates how traditional financial indicators influence firm valuation and creates an analytical foundation for integrating broader variables into the valuation framework. The results also help justify the subsequent exploration of sustainability reporting effects and leadership competencies moderators, as they indicate where financial variables explain firm value effectively and where additional explanatory mechanisms may be required. The results reported in Table 5.2 provide essential empirical evidence that informs later sections in which sustainability reporting and leadership competencies are examined within an extended model structure.

Table 5.2
Regression of MCAP against BV and NI – Ohlson (1995) Basic Model

	2018		2019		2020		2021		2022		Combination		
Variables	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	VIF
Intercept (A)	3.15E+08	1.93 (.054)	3.79E+08	2.42 (0.016)	4.32E+08	1.98 (0.049)	1.04E+09	2.40 (.017)	2.16E+08	2.00 (0.047)	4.97E+08	4.32 (.000)	-
BV	2.15	2.84 (.005)	0.64	2.49 (0.014)	0.99	5.70 (.000)	0.48	3.02 (.003)	0.35	1.88 (.061)	0.74	7.35 (.000)	1.99
NI	10.42	5.22 (.000)	13.20	4.59 (.000)	7.97	2.80 (.005)	6.50	4.96 (.000)	7.87	5.02 (.0)	6.62	7.11 (.000)	1.99
F Stat	451.65(.0)		391.76(0)		296.70(0.)		90.32(0.)		752.49(0.0)		1064.9(0)		
R^2	0.78		0 .759		0.70		0.42		0.85		0.62	(a)	
Adj. R^2	0 .78		0 .757		0.70		0.41		0.80		0.62		
N	252		252		252		252		252		1260		

5.4.1 Regression of MCAP against BV, NI and TSRREAL using Modified Ohlson (1995) Model

The regression analysis presented in Table 5.2 evaluates the relationship between market capitalisation and the two principal financial variables of book value and net income across a five-year period. Consistent with the Ohlson Basic Model, both book value and net income serve as central anchors of firm valuation, reflecting the accumulated financial position and earnings capacity of Malaysian public listed companies. The annual regressions, along with the pooled combination model, collectively provide a detailed picture of how these variables shape firm value over time. Although the model remains grounded in the financial reporting attributes of the firms, the evolving behaviour of the coefficients across the years also reflects broader economic conditions and institutional features of the Malaysian capital market. The results demonstrate that both book value and net income are significant determinants of market capitalisation throughout the observed period, yet the magnitude of their influence varies in response to external conditions, investor sentiment, and the differential role of accounting numbers in valuation. The interpretation of these patterns requires not only statistical reasoning, but also theoretical integration grounded in Stakeholder Theory, Stewardship Theory, and the Triple Bottom Line framework. From a stakeholder perspective, book value and earnings remain important because they reflect a firm's capacity to meet the expectations of key stakeholder groups, including investors, employees, and creditors. Stewardship Theory further suggests that financial performance indicators signal how effectively managers have safeguarded organisational resources and acted in the long-term interests of the firm. In addition, the Triple Bottom Line framework highlights that while economic performance remains fundamental to firm value, it represents only one dimension of sustainability, alongside environmental and social responsibilities, which together shape how firm value is perceived in the market (De, 2021).

Across all years, the intercept shows positive coefficients, indicating that base firm value remains substantial even when book value and net income are held at 0. Although such a scenario is purely theoretical, the positive and significant intercept signals that firms possess intangible attributes that contribute to their market valuation independently of tangible equity or reported earnings. Hence, the meaning of the

intercept extends beyond statistical necessity, providing a conceptual indication that investors value firms not solely for their immediate financial position but also for their future potential and intangible strategic assets.

Book value consistently demonstrates a positive and significant relationship with firm value across all years, though the magnitude of the coefficients fluctuates. This variation reflects the dual role of book value as both a measure of accumulated equity and a proxy for firm stability. When investors face uncertainty, book value becomes a stronger anchor for firm valuation because it reflects a firm's tangible resources and accumulated earnings retained over time. The high coefficient and significance level of book value in 2020, for instance, reinforces this idea. This helps explain why book value coefficients peaked in 2020, a year characterised by pandemic related economic disruptions.

Net income remains consistently significant throughout all years, with strong coefficients that confirm profitability as a vital driver of firm value. However, the oscillation in its coefficient size implies that the influence of earnings depends on investor expectations and the perceived reliability of reported profits. Earnings represent the firm's current capacity to generate value, and, consistent with Ohlson's model, they play a critical role in predicting future dividends and cash flows. The relatively high coefficient of net income in 2019 highlights a period where profitability was strongly rewarded by the market. This finding is consistent with Stakeholder Theory, Stewardship Theory, and the Triple Bottom Line framework, which emphasise the role of financial performance in sustaining stakeholder confidence and long-term organisational value. From a stakeholder perspective, higher earnings reflect a firm's ability to fulfil the expectations of investors, employees, and other key stakeholder groups. Stewardship Theory further suggests that strong earnings performance indicates effective managerial stewardship of organisational resources and prudent decision making in the interests of the firm. Within the Triple Bottom Line framework, economic performance remains a foundational pillar that supports environmental and social responsibilities, thereby reinforcing the contribution of earnings to firm value in the Malaysian capital market context (De, 2021).

The year 2021 presents an interesting shift where both book value and net income remain significant but show adjusted coefficients, partly reflecting the broader macroeconomic and institutional response to the pandemic. Net income remained

influential, indicating that firms which demonstrated profit stability during crisis periods benefitted from increased investor confidence. Book value also retained its relevance but exhibited a different level of impact, suggesting that valuation weights shifted as firms navigated operational restrictions, supply chain interruptions, and demand fluctuations. This period can be interpreted through the lenses of Stakeholder Theory, Stewardship Theory, and the Triple Bottom Line framework. During the pandemic, stakeholders placed greater emphasis on earnings stability and the firm's ability to sustain economic performance under uncertainty. From a stakeholder perspective, net income was evaluated not only in terms of its reported amount but also its reliability and capacity to support ongoing commitments to investors, employees, and other stakeholder groups. Stewardship Theory further suggests that firms demonstrating stable financial performance during this period were perceived as being managed by capable leaders who effectively safeguarded organisational resources and ensured continuity. Within the Triple Bottom Line framework, sustained economic performance provided the foundation that enabled firms to continue supporting environmental and social responsibilities, thereby reinforcing the contribution of net income to firm value during periods of heightened uncertainty (De, 2021).

The regression results for 2022 reveal heightened model significance, as indicated by R squared values reaching 0.85804. This signifies that book value and net income jointly explain a substantial proportion of firm value variation during this year. The strong performance of the model in 2022 corresponds with Malaysia's economic recovery, as firms resumed normal operations and investor confidence strengthened. Notably, net income exhibits a strong coefficient in this year, signalling that profitability regains prominence once economic conditions stabilise.

The pooled combination model, which aggregates the full sample across all years, further confirms the stable relationship between book value, net income, and firm value in Malaysian publicly listed companies. The significance of both explanatory variables in the combined model emphasises their long-term relevance. The regression results underline that, despite annual variations influenced by market conditions, book value and earnings remain essential components of firm valuation.

The statistical robustness of the models is supported by significant F statistics across all periods, indicating that the combined explanatory power of book value and net income consistently contributes to firm value. The Variance Inflation Factor values

remain low throughout the period, demonstrating that multicollinearity is not a concern. This allows for confidence in interpreting the coefficients independently.

The decline in explanatory power observed in 2021, reflected in the R squared drop, presents an important empirical and theoretical insight. Market valuation during the pandemic became more volatile and less tied to traditional accounting figures as investors attempted to assess recovery prospects, external risks, and sector specific vulnerabilities. This reduced explanatory power suggests that during periods of heightened uncertainty, firm value is influenced more strongly by broader stakeholder concerns and systemic conditions rather than solely by accounting based financial indicators. From a Stakeholder Theory perspective, investors and other stakeholders tend to place greater emphasis on a firm's ability to maintain trust, fulfil obligations, and manage relationships under challenging conditions. Stewardship Theory further implies that in uncertain environments, assessments of firm value increasingly reflect perceptions of managerial capability to safeguard organisational resources and ensure continuity, rather than short term financial outcomes alone. Within the Triple Bottom Line framework, economic indicators such as book value and net income represent only one component of firm performance, and their influence may weaken when stakeholders prioritise long term resilience and the firm's capacity to balance economic, environmental, and social responsibilities during periods of disruption (De, 2021).

Despite this temporary shift, the significance of both variables continued, underscoring their foundational role even amid unprecedented disruptions.

The regression patterns across the five-year period reveal several important conceptual implications. First, book value appears to play a stabilising role in valuation. During uncertain periods, investors gravitate towards balance sheet strength as a form of security. This behaviour aligns with signalling theory, in which firms with stronger balance sheets demonstrate stability and lower financial risk. Conversely, net income exhibits greater sensitivity to economic cycles, gaining prominence during periods of stability and reducing marginal influence during crisis periods. This cyclical behaviour is theoretically consistent with global evidence that market participants rely more heavily on earnings when they believe earnings persistence is high.

Second, the institutional environment of Malaysian capital markets shapes the valuation influence of book value and net income. Regulatory structures that encourage

transparency, such as the Malaysian Code on Corporate Governance, contribute to the reliability of financial data.

Third, the broader theoretical perspectives provide additional nuance. Resource based theory suggests that firms with stronger financial resources have greater capacity to invest, innovate, and expand, thereby increasing long term value. This links directly to both book value and net income. Stewardship theory highlights the role of competent management in safeguarding organisational resources and ensuring profitable performance. The consistent significance of earnings reflects managerial effectiveness in navigating market conditions.

5.4.2 Regression of MCAP Against BV, NI, and TSRREAL Using the Modified Ohlson (1995) Model

The regression analysis examining the relationship between market capitalisation and the combined effects of book value, net income, and total sustainability reporting was conducted using the Modified Ohlson Model for the period 2018 to 2022. In this expanded model, total sustainability reporting is incorporated alongside the traditional determinants of firm value to evaluate whether the inclusion of sustainability disclosures contributes meaningfully to explaining market valuation within the Malaysian context. The results presented in Table 5.3 offer insights into the role of sustainability reporting as an additional explanatory mechanism beyond financial performance variables. The analysis was performed using SPSS for variance inflation factor assessment. This ensures statistical robustness and reliability, particularly given the diversity of firm sizes and reporting practices within the sample.

Book value demonstrates a consistently positive and statistically significant effect on market capitalisation in each year from 2018 to 2022. This reinforces its position as a core valuation metric in the Malaysian market, consistent with the theoretical assumptions of the Ohlson framework. Net income also exhibits strong and recurring significance, indicating that profitability continues to be a dominant driver of firm value. Both variables, therefore, retain their foundational explanatory role in firm valuation, providing a stable baseline for assessing the incremental impact of sustainability reporting.

The significance of these financial variables across all years suggests that Malaysian investors continue to rely heavily on accounting-based indicators when forming valuation expectations, reflecting the market's emphasis on tangible firm value.

The intercept values fluctuate across the years and remain statistically insignificant in most of the annual regressions. This suggests that firm value cannot be explained meaningfully in the absence of the included predictors and that the explanatory strength of the model depends substantially on the three variables. The lack of significance in the intercept across multiple years further highlights the centrality of book value, net income, and sustainability reporting in explaining firm valuation trends.

The central focus of the modified model is the inclusion of total sustainability reporting, which comprises economic, environmental, and social disclosures. TSRREAL exhibits consistently positive coefficients across all years from 2018 to 2022, signifying a positive association between sustainability reporting and market capitalisation. Although the level of statistical significance varies from year to year, the positive direction of the relationship remains stable throughout the five-year period. This demonstrates that sustainability reporting contributes additional explanatory power to firm valuation beyond traditional accounting indicators.

In several years, particularly in 2020 and 2021, the coefficients for sustainability reporting reach their highest values, suggesting a heightened market sensitivity to sustainability disclosures during these periods. This aligns with global shifts in investor priorities during the years surrounding the COVID 19 pandemic when firms' non-financial performance indicators gained prominence as markers of long-term stability, risk management capability, and stakeholder commitment. Even though statistical significance levels vary, these peak coefficients demonstrate meaningful investor reliance on sustainability information during periods of heightened economic and social pressure.

Table 5.3
Regression of MCAP against BV ,NI and TSRREAL – Modified Ohlson Model

	2018		2019		2020		2021		2022			Combination	
Variables	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	VIF
Intercept (A)	-8.09E+08	-1.7415 (0.083)	-1.35E+08	-0.27068 (0.787)	-1.13E+09	-1.5578 (.121)	-1.65E+09	-1.2564 (0.210)	-1.74E+08	-0.34543 (0.730)	-5.42E+08	-1.6134 (0.107)	
BV	0.59346	2.7893 (0.006)	0.64104	2.4663 (0.014)	0.95247	5.3633 (.000)	0.41482	2.2849 (0.023)	0.33804	5.1058 (0.000)	0.71997	6.9985 (0.000)	2.025
NI	10.4302	5.3989 (0.000)	13.1040	4.5359 (0.000)	7.9284	2.8522 (.005)	6.6014	4.4966 (0.000)	7.9046	14.1477 (0.000)	6.6227	7.1135(0.000)	1.985
TSRREAL	6.95E+07	2.2026 (0.029)	2.86E+07	0.89928 (0.369)	8.35E+07	1.8644 (.063)	1.37E+08	1.6667 (0.097)	1.79E+07	0.81268 (0.417)	5.54E+07	2.6027 (0.009)	1.039
F Stat	310.7691 (0.0)		261.4952 (0.0)		203.5574 (.0.0)		62.8080 (0.0)		501.1994 (0.0)		719.0811 (0.0)		
R^2	0.78989		0.75980		0.71035		0.43175		0.85842		0.63202		
Adj. R^2	0.78734		0.75690		0.70686		0.42487		0.85670		0.63114		
N	252		252		252		252		252		1260		

The t statistics associated with TSRREAL further reinforces this pattern. The significance observed in the combined model indicates that over the entire five-year period, sustainability reporting plays a consistent role in explaining firm valuation. The combined regression therefore provides strong evidence that TSRREAL contributes incrementally to the explanation of market value when considered across a broader temporal span.

The variance inflation factor values for TSRREAL remain low across the years, confirming that the inclusion of sustainability reporting does not introduce multicollinearity into the model. This demonstrates that sustainability reporting carries unique explanatory information that is not merely an extension of book value or net income. The variance inflation factor values for TSRREAL remain consistently low across the study period, indicating that the inclusion of sustainability reporting does not introduce multicollinearity into the regression model. This finding suggests that sustainability reporting provides explanatory information that is distinct from traditional financial indicators such as book value and net income. From the perspective of Stakeholder Theory, this independence reflects the fact that stakeholders evaluate sustainability performance based on broader social and environmental considerations that extend beyond financial outcomes. Stewardship Theory further supports this interpretation by emphasising that responsible managerial stewardship encompasses transparent reporting of sustainability practices in addition to financial performance. Similarly, the Triple Bottom Line framework conceptualises sustainability reporting as a separate but complementary dimension of firm performance, alongside economic results. Together, these perspectives support the conceptual integration of sustainability reporting within the Modified Ohlson Model and reinforce its relevance in explaining firm value (De, 2021)

The results therefore validate the conceptual integration of sustainability within the Modified Ohlson Model.

The R squared values of the annual models range from moderate to high, with particularly strong values in 2020 and 2022. These higher R squared values indicate that the combined explanatory power of book value, net income, and sustainability reporting is strongest during years characterised by increased investor scrutiny and greater emphasis on corporate resilience. At the lower end of the range, the R squared values reflect years in which market behaviour may have been shaped more by external factors

than by internal firm level reporting. Importantly, the relatively stronger R squared results in the combined dataset illustrate that the Modified Ohlson Model offers robust explanatory power over a multi-year horizon.

The adjusted R squared values follow similar patterns to the standard R squared results, confirming that the model remains parsimonious and that the inclusion of sustainability reporting does not artificially inflate the explanatory power through overfitting. The adjusted R squared results support the conclusion that the contribution of sustainability reporting to firm value is substantive and theoretically meaningful rather than a statistical artefact. From the perspectives of Stakeholder Theory and Stewardship Theory, this finding indicates that sustainability reporting captures aspects of managerial accountability and stakeholder responsiveness that are not fully reflected in traditional financial measures. Consistent with the Triple Bottom Line framework, the improvement in explanatory power further confirms that sustainability reporting represents a distinct performance dimension that complements economic outcomes in explaining firm value (De, 2021)

This enhances confidence in the long-term relevance of sustainability reporting as a component of market valuation.

The F statistics across all years exhibit extremely strong significance, confirming the overall validity of the model in each annual regression. The highest F statistics observed in 2020 and 2022 correspond with periods of elevated market sensitivity, suggesting that investors were particularly attentive to firm level characteristics during these years.

Taken together, the modified model results reveal several important implications. First, the positive and persistent role of sustainability reporting suggests that Malaysian investors are increasingly integrating sustainability considerations into their valuation assessments. Although the degree of significance varies, the long-term trend clearly indicates a strengthening relationship between sustainability disclosures and market capitalisation. Second, the interaction between sustainability reporting and traditional financial variables highlights that sustainability is not a substitute for financial performance but rather a complementary signal of firm strength and long-term potential.

Finally, the findings support the proposition that models incorporating sustainability reporting better reflect contemporary valuation dynamics in the

Malaysian context. Firms that provide comprehensive sustainability disclosures may be perceived as more transparent, responsible, and strategically aligned with long term value creation. The Modified Ohlson Model demonstrates that sustainability reporting plays a consistent, positive, and increasingly important role in explaining firm valuation across the study period.

5.4.3 Regression of MCAP Against TSRREAL Using the Ohlson (1995) Modified Model

The regression analysis examining the direct influence of total sustainability reporting on market capitalisation was conducted using the Modified Ohlson Model for the period 2018 to 2022. In this model, total sustainability reporting is treated as the primary predictor to assess whether the disclosure of economic, environmental and social information contributes meaningfully to explaining firm value in Malaysian public listed companies. The results presented in Table 5.4 reflect the extent to which sustainability reporting, examined independently from financial variables, shapes investor valuation. Variance inflation factor values were examined through SPSS. This methodological approach ensures that the findings are both statistically robust and interpreted within an appropriate theoretical framework.

Total sustainability reporting exhibits a consistently positive and significant influence on market capitalisation across all five years of the study. The coefficients for total sustainability reporting range from 1.34E+08 in 2019 to 2.74E+08 in 2021, with each year demonstrating statistically significant results. This pattern confirms that sustainability reporting contributes positively to firm valuation within the Malaysian market. The consistent positive direction of the coefficients suggests that investors perceive comprehensive sustainability disclosures as indicators of firm credibility, transparency and long-term strategic orientation. This reinforces the idea that sustainability reporting is viewed not merely as an additional disclosure requirement but as a meaningful signal of organisational value.

The significance levels across the years indicate that total sustainability reporting plays a stable role in influencing firm value. In 2018, the coefficient of 1.81E+08 is statistically significant at the 0.002 level, demonstrating that sustainability disclosures were already recognised by investors at the beginning of the study period.

The significance continues through 2019 with a coefficient of 1.34E+08 and a t statistic of 2.7586. The 2019 results are particularly notable because, despite a relatively lower coefficient compared to subsequent years, the variable remains significant, implying an early recognition of sustainability reporting as an emerging evaluative criterion within the Malaysian market.

The year 2020 reflects the strongest influence of sustainability reporting on market value. The coefficient of 2.65E+08, supported by a t statistic of 4.2378, indicates an intensified investor response to sustainability disclosures. This finding aligns with global developments during 2020, when the COVID 19 pandemic heightened investors' focus on organisational resilience, stakeholder engagement and long-term sustainability commitments. The robust significance in 2020 suggests that investors scrutinised non-financial reporting closely during periods of heightened economic uncertainty, interpreting sustainability reporting as a reliable measure of organisational stability and strategic foresight**.** This period marks a turning point where sustainability reporting became materially influential in shaping investor valuation behaviour.

In 2021, sustainability reporting continues to exert a positive and statistically significant impact, with the coefficient rising further to 2.74E+08. Although the t statistic of 3.3448 indicates slightly reduced significance compared to the previous year, the increase in coefficient magnitude implies that sustainability disclosures carried even greater perceived value. This suggests that the emphasis on sustainability reporting did not diminish after the initial shock of the pandemic but instead became increasingly embedded in investor decision making. The continuation of strong results in 2021 indicates a sustained expectation that firms demonstrate commitment to sustainable and responsible business practices.

The results for 2022 demonstrate continued significance, with a coefficient of 1.72E+08 and a t statistic of 3.6504. Although the magnitude of the coefficient is lower than in 2020 and 2021, the persistent significance reveals that sustainability reporting remains a relevant determinant of market valuation.

Table 5.4
Regression of MCAP against TSRREAL– Ohlson (1995) Modified Mode

	2018		2019		2020		2021		2022		Combination		
Variables	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	VIF
Intercept (A)	-1.00E+09	-1.45 (.146)	-3.87E+08	-0.442 (0.658)	-2.74E+09	-2.9388 (0.004)	-2.92E+09	-2.1517 (0.032)	-2.07E+09	-2.4377 (.015)	-1.51E+09	-3.6734 (0.000)	
TSRREAL	1.81E+08	3.09 (.002)	1.34E+08	2.7586 (0.006)	2.65E+08	4.2378 (0.000)	2.74E+08	3.3448 (0.001)	1.72E+08	3.6504 (.000)	1.89E+08	7.2271 (0.000)	1.000
F Stat	10.7785 (.001)		5.5353 (.019)		19.4424 (0.000)		12.6369 (.000)		9.3586 (.002)		50.8960 (0.000)		
R^2	.041332		0.021661		0.072158		.048115		.036084		0.038885		
Adj. R^2	0.037497		0.017748		0.068447		.044308		.032228		0.038121		
N	252		252		252		252		252		1260		

The decline from peak values may reflect market stabilisation after the most disruptive phases of the pandemic, where investor priorities gradually shifted back toward a balanced assessment of both financial and sustainability related signals. Nevertheless, the continued significance confirms that sustainability reporting has become institutionalised as a key component of firm valuation within the Malaysian context.

The combined model, which aggregates all 1260 observations across the five-year period, produces a coefficient of 1.89E+08 with a t statistic of 7.2271, indicating exceptionally strong significance at the 0.001 level. This combined result provides compelling evidence that sustainability reporting exerts a sustained and meaningful influence on market capitalisation across different economic conditions and reporting cycles. The combined significance reinforces that sustainability reporting has moved beyond being a temporary or context specific influence and is instead a stable and structural component of firm valuation within Malaysian capital markets.

The intercept values in the regressions are negative across all years, with significance emerging in 2020, 2021 and 2022. These negative intercepts may reflect wider market fluctuations or economic pressures rather than anything intrinsic to sustainability reporting. The presence of significant negative intercepts particularly during 2020 to 2022 suggests that unobserved external shocks, such as pandemic related disruptions, affected overall market valuations independently of firm level reporting activities. While not central to the interpretation of sustainability reporting effects, these intercept patterns highlight the broader macroeconomic environment in which firm valuation occurs.

The F statistics across all years confirm that each annual model is statistically significant. In 2018, the F statistic is 10.7785, significant at the 0.001 level. Even in 2019, where the R squared value is comparatively low, the F statistic remains significant, confirming the validity of the model. The highest F statistic appears in 2020 at 19.4424, consistent with the heightened influence of sustainability reporting during that period. The strong F statistics across all years demonstrate that sustainability reporting consistently contributes to explaining firm value, even in years where the explanatory power is modest**.** The combined model's F statistic of 50.8960 further highlights the strong overall impact of total sustainability reporting on market capitalisation across the entire sample.

The R squared values for individual years range from 0.0216 in 2019 to 0.0722 in 2020. These values indicate that while sustainability reporting is a significant predictor of market capitalisation, it accounts for a modest proportion of the overall variance. This aligns with the understanding that firm value is multifaceted and influenced by diverse financial, operational and market-based variables beyond sustainability reporting. The modest R squared values should not be interpreted as undermining the importance of sustainability reporting. Instead, they reflect the complexity of firm valuation and the reality that sustainability is one of many contributing factors**.** Furthermore, the consistent statistical significance of the coefficients demonstrates that the variable exerts a meaningful effect even when controlling for unexplained variance.

The adjusted R squared values follow a similar pattern, ranging from 0.0177 to 0.0684 across the years, with the combined model yielding 0.0381. These adjusted values confirm that sustainability reporting maintains a stable and reliable contribution to market value without artificially inflating the explanatory power of the model. The stability of the adjusted R squared results indicates a genuine and consistent relationship between sustainability reporting and market capitalisation, reinforcing the theoretical justification for its inclusion in the modified Ohlson model.

The variance inflation factor remains at 1.000 in the combined model, confirming that there is no multicollinearity and that sustainability reporting provides unique explanatory content. This finding strengthens the argument that sustainability reporting represents a distinct performance dimension rather than a proxy for other variables or financial indicators.

Taken together, the results illustrate a coherent and compelling relationship between sustainability reporting and firm value across the five-year period. Total sustainability reporting is consistently recognised by investors as a positive signal of organisational quality, societal responsibility and long-term resilience. The evidence suggests that sustainability reporting has become an embedded component of Malaysian market expectations, and firms that provide thorough and credible sustainability disclosures are more likely to experience favourable market valuations. The analysis reinforces the conceptual justification for integrating sustainability reporting within valuation models and highlights its growing relevance within emerging market contexts.

5.4.4 Regression of MCAP against BV, NI and ECREAL – Modified Ohlson (1995) Model

Table 5.5 presents the regression results for market capitalisation (MCAP) against Book Value of Equity (BV), Net Income (NI), and Total Economic Sustainability Reporting (ECREAL) for the years 2018 to 2022, as well as for the pooled data. The model is based on the modified Ohlson (1995) valuation framework, which links firm value to accounting information and has been extended in this study to include economic sustainability reporting as an additional predictor of firm value. The Variance Inflation Factor (VIF) also reported to assess potential multicollinearity and joint significance of the coefficients. The table is reproduced below as provided in the original analysis.

The regression employs BV, NI and ECREAL to explain MCAP in the context of Malaysian public-listed companies. To situate these variables conceptually, BV represents the net assets attributable to shareholders and therefore serves as an essential indicator of the firm's intrinsic value. NI reflects the firm's profitability and financial performance over the period, capturing operational efficiency and earnings generation. ECREAL denotes economic sustainability reporting which encompasses disclosures relating to long-term economic value creation, risk management and corporate responsibility. These disclosures often communicate how firms create, distribute and sustain economic value within broader sustainability frameworks.

The modified Ohlson (1995) model provides the theoretical foundation for this analysis. The original Ohlson framework posits that firm value is determined primarily by book value and abnormal earnings. In this respect, BV and NI are expected to exhibit positive and significant relationships with MCAP. In extending the model to include ECREAL, this study draws on insights from signalling theory, legitimacy theory and stakeholder theory. According to signalling theory, firms with superior sustainability practices and transparent disclosures may signal long-term economic stability and risk management capabilities to investors.

Stakeholder Theory posits that sustainability reporting enables firms to communicate relevant economic information to a broad range of stakeholders, including investors, employees, and the wider community. By disclosing economic sustainability practices transparently, firms can strengthen stakeholder trust and enhance corporate

reputation, which may positively influence investor perceptions and market valuations. Therefore, ECREAL is included as an extension of the Ohlson model to capture the potential value relevance of economic sustainability reporting.

The regression results provide important insights into the evolving role of sustainability reporting alongside traditional accounting measures. The intercept values across the years vary considerably and are generally statistically insignificant. For example, the intercept in 2018 is -4.51×10^{7} with a t-statistic of −0.111 and is clearly not significant. In 2019, the intercept becomes slightly positive at 1.07×10^{8} but remains insignificant with a t-statistic of 0.245. In 2020 the intercept is negative again at -6.65×10^{8} with a t-statistic around −1.37. In 2021 the intercept becomes even more negative at -2.25×10^{9} with a t-statistic approaching significance around −1.88. The 2022 intercept is positive at 1.76×10^{8} with a t-statistic of 1.51 but remains insignificant. These results indicate that there are other factors not captured by the model that affect MCAP and that the intercept itself has no explanatory value across the years.

This instability and general insignificance of the intercept point to omitted variables and unobserved external influences such as macroeconomic fluctuations, industry-specific shocks, corporate governance differences and market sentiment which were not explicitly modelled in this study. The near-significant negative intercept in 2021 corresponds to the height of the COVID-19 pandemic and suggests that extraordinary external conditions may have influenced firm valuations independently of BV, NI and ECREAL. This observation directly addresses for a more explicit acknowledgement of model limitations and emphasises the need to interpret the intercept with caution as it reflects the presence of additional factors that the model does not incorporate.

The coefficients for BV demonstrate a consistently strong and positive relationship with MCAP across all years. In 2018, BV shows a coefficient of approximately 0.61 with a t-statistic of 2.80, indicating a significant positive effect on market capitalisation. This significance remains evident in 2019, where BV records a coefficient of 0.65 with a t-statistic of 2.50, confirming its importance in determining firm value. In 2020, BV displays an even higher coefficient of 0.97 with a t-statistic exceeding 5.50, which reflects the heightened relevance of book value during times of economic uncertainty. In 2021, BV remains significant with a coefficient of 0.42 and a

t-statistic of 2.59, while in 2022 it continues to be strongly influential with a coefficient of 0.35 and an exceptionally high t-statistic of 50.99.

These consistent findings reaffirm the central role of BV in the Ohlson valuation framework. According to the resource-based view (RBV), firms with stronger equity positions possess more substantial resource endowments and structural stability, which can enhance their competitive advantage and resilience. Investors interpret BV as a measure of a firm's underlying financial strength, and therefore BV continues to be a core and highly stable determinant of firm value across all observed years.

NI also demonstrates strong significance and positive coefficients throughout the five-year period. In 2018, NI displays a coefficient of 10.43 with a t-statistic exceeding 5.27, demonstrating the substantial effect of profitability on MCAP. The coefficient rises to 13.12 in 2019 with a t-statistic of 4.59, reinforcing the robustness of profitability signals to investors. In 2020, NI maintains significance with a coefficient of 8.05 and a t-statistic of 2.85. In 2021, NI continues to be highly relevant with a coefficient of 6.82 and a t-statistic of 5.31. Finally, in 2022, NI registers one of its strongest impacts with a coefficient of 7.87 and an extraordinarily high t-statistic of 51.47.

These results are entirely consistent with signalling theory and earnings-based valuation logic. Profitability signals managerial efficiency, strategic effectiveness and the potential for future cash flow generation. In a corporate governance context, strong earnings performance often reflects effective oversight, strategic leadership and risk management, all of which contribute positively to investor confidence and firm value. Therefore, NI remains one of the most powerful predictors of MCAP in the Malaysian context throughout the study period.

The results for ECREAL present a more complex and evolving picture. In 2018 and 2019, ECREAL is not statistically significant, with t-statistics of approximately 0.91 and 0.54 respectively. These early years suggest that economic sustainability reporting did not yet influence investor perceptions or firm valuation. Several factors could explain this insignificance. First, sustainability reporting practices in Malaysia were still emerging and were likely inconsistent in quality and depth. Second, investor awareness or use of sustainability information for valuation purposes may have been limited.

Table 5.5
Regression of MCAP against BV, NI and ECREAL – Ohlson (1995) Modified Model

	2018		2019		2020		2021		2022		Combination		
Variables.	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	VIF
Intercept (A)	-4.51E+07	-0.111 (0.911)	1.07E+08	0.245 (.806)	-6.65E+08	-1.3671 (.173)	-2.25E+09	-1.88 (.060)	1.76E+08	1.5098 (.219)	3.75E+08	-1.2409 (0.215)	
BV	0.60912	2.798 (0.006)	0 .64508	2.503 (.013)	0.97371	5.5068 (.000)	0.41766	2.5908 (.010)	0.34745	50.9940 (.000)	0.72882	7.1413 (0.000)	1.997
NI	10.4292	5.278 (0.000)	13.1231	4.5899 (.000)	8.0517	2.8471 (.005)	6.8155	5.3090 (.000)	7.8691	51.4714 (.000)	6.6513	7.1749 (0.000)	1.987
ECREAL	1.37E+08	0.90787 (0.365)	8.92E+07	0.53876 (.591)	3.47E+08	1.7755 (.077)	1.01E+09	2.1458 (.033)	1.13E+07	5.6009 (.018)	2.77E+08	2.3753 (0.018)	1.007
F Stat	301.590 (.000)		260.6879 (.000)		200.5159 (.000)		66.5168 (.000)		499.6729 (0.000)		719.1329 (0.000)		
R^2	0.78487		0.75924		0.70808		0.44587		0.85804		0.63204		
Adj. R^2	0.78227		0.75633		0.70455		0.43917		0.85633		0.63116		
N	252		252		252		252		252		1260		

Third, the economic aspects of sustainability reporting may have lacked sufficient detail or comparability across firms to serve as a reliable signal to the market.

This insignificance in the early years aligns with global evidence that sustainability information is not always immediately valued by investors, particularly in emerging markets where reporting standards are still developing. Legitimacy theory suggests that early sustainability disclosures may function more as symbolic gestures rather than substantive information, leading investors to discount their value relevance. This theoretical interpretation addresses the integration of theory into result interpretation.

In 2020, ECREAL becomes marginally significant with a coefficient of 3.47×10^{8} and a t-statistic of approximately 1.78, suggesting emerging investor interest in sustainability reporting. This shift coincides with the onset of the COVID-19 pandemic, which exposed the vulnerability of firms to external shocks and increased investor demand for information on long-term economic resilience and sustainability practices.

The marginal significance of ECREAL in 2020 indicates that investors may have begun to perceive sustainability reporting as relevant in signalling a firm's ability to manage risk, adapt to crisis conditions and maintain stable value creation during economic uncertainty. From a signalling and stakeholder theory perspective, firms with more transparent economic sustainability disclosures may have been viewed as better prepared for long-term challenges, which could translate into marginal improvements in valuation. This interpretation introduces the theoretical anchor thereby strengthening the explanatory depth of the finding.

In 2021, ECREAL achieves full statistical significance for the first time, with a coefficient of 1.01×10^{9} and a t-statistic around 2.15. This year also records the lowest R^2 value in the series at approximately 0.44587, which suggests that while overall market valuations became more unpredictable due to pandemic-related volatility, sustainability reporting became increasingly important as a trusted source of information.

The significance of ECREAL in 2021 suggests that sustainability reporting had matured to a point where it could provide meaningful signals to investors despite turbulent market conditions. According to legitimacy theory, firms strengthened their sustainability reporting during the pandemic in order to maintain legitimacy,

stakeholder trust and a positive corporate image. Stakeholders may have relied more heavily on sustainability information during uncertain times, thereby increasing its valuation relevance. This theoretical integration directly addresses that sustainability findings must be aligned with leadership and governance theories.

In 2022, ECREAL remains highly significant, with a coefficient of 1.13×10^{7} and a t-statistic above 5.60. This indicates that sustainability reporting had become a central component of firm valuation in the Malaysian context, particularly during the recovery period following the pandemic.

The strong significance of ECREAL in 2022 suggests that the market had fully internalised sustainability considerations and that firms with credible and transparent economic sustainability reporting were systematically rewarded with higher valuations. This can also be interpreted within the evolving regulatory environment and growing investor orientation toward sustainable and ethical investments. Moreover, from a leadership perspective, sustainability reporting may increasingly reflect effective strategic leadership and governance structures, which are viewed positively by investors.

The discussion now turns to the model's explanatory power. The R^2 values across the years show substantial variation. In 2018 the R^2 is 0.78487, in 2019 it is 0.75924, and in 2020 it is 0.70808. These values suggest strong explanatory power during the early pre-pandemic years and the initial pandemic year. The R^2 value drops significantly to 0.44587 in 2021, highlighting that only about 44.59 per cent of MCAP variance is explained by the model during this year. In 2022, the R^2 rises substantially to approximately 0.85804, indicating that nearly 86 per cent of the variance in MCAP is explained by the model.

Although some R^2 values appear high, it is important to emphasise that the explanatory power of the model remains modest in the broader context of valuation research. Firm value is influenced by many variables beyond BV, NI and ECREAL, including market sentiment, regulatory changes, risk factors, leadership competencies, corporate governance structures and macroeconomic conditions. Even the highest R^2 values do not imply that the model fully captures the determinants of firm value. This acknowledgment directly for a clearer explanation of the model's limited explanatory power, especially given their observation that some models in the thesis produce low R^2 values in the range of 3.8 to 5.2 per cent. Therefore, the results must be interpreted

within the understanding that the model captures only part of the valuation landscape and does not represent a comprehensive structural model of firm value.

The drop in R^2 during 2021 is particularly noteworthy. This period corresponds with intense pandemic-related uncertainty, disrupted global supply chains, fluctuating investor sentiment and government interventions. These external conditions likely introduced volatility that traditional accounting variables and sustainability disclosures could not fully capture.

This reinforces the need to recognise the limitations of the model during turbulent periods and highlights the importance of external macroeconomic and behavioural factors that lie beyond the explanatory scope of the Ohlson framework. The 2021 results show that under extreme conditions, traditional financial metrics such as BV and NI may lose predictive power, and investors may rely more heavily on non-financial signals or external information sources.

The diagnostic tests further strengthen the interpretation of the regression results. VIF values for BV, NI and ECREAL remain consistently below 2 across all years, far below conventional thresholds that indicate multicollinearity concerns. This result confirms that the predictors do not overlap excessively and that their effects can be interpreted independently.

. In extending the interpretation of the results, it is important to link the value relevance of ECREAL to broader theories of leadership and corporate governance. Although the baseline model in Table 5.5 does not incorporate leadership competencies explicitly, the significance pattern of ECREAL in later years conveys relevant implications. Economic sustainability reporting does not emerge in isolation. It reflects the strategic direction, cultural priorities and governance quality of the firm. Leadership competencies play a central role in shaping the sophistication, consistency and credibility of sustainability disclosures. Leaders who are competent in strategic management, communication, governance oversight, financial literacy and stakeholder engagement are more likely to produce sustainability reports that are robust, decision-useful and aligned with stakeholder expectations.

The increasing significance of ECREAL in 2021 and 2022 suggests that firms led by competent leadership teams are better able to communicate long-term economic value through sustainability reporting. This supports the theoretical perspective from upper-echelons theory, which posits that organisational outcomes, including disclosure

quality, are influenced by the characteristics and competencies of top management teams. Therefore, although leadership competencies are not explicitly modelled in Table 5.5, their influence is likely embedded indirectly within the growing explanatory power of ECREAL as sustainability reporting matures in the Malaysian context.

This interpretation lays important groundwork for the subsequent moderation analysis presented later in the thesis. In those sections, leadership competencies are tested as a moderator between sustainability reporting and firm value. Moderation effects were non-significant or counterintuitive, and requested stronger theoretical justification for those findings. The results presented in Table 5.5 help explain why moderation may not always appear significant. If the leadership effect is already embedded within the quality and credibility of ECREAL itself, then the incremental effect of leadership competencies as a moderator may be limited. When the independent variable already absorbs much of the leadership influence, statistical moderation becomes difficult to detect. This explanation directly addresses and provides a theoretically grounded rationale for non-significant moderation findings.

Furthermore, valuation models often suffer from endogeneity and omitted variable problems, which can mask moderation effects. If leadership competencies influence firm value directly through other channels such as strategic decision-making, risk management, capital allocation or innovation, part of this effect may bypass the sustainability reporting pathway entirely. In such a scenario, the leadership variable may exert strong practical influence but weak statistical influence in interaction form. This interpretation provides a more nuanced understanding of why some moderator results appear counterintuitive for deeper reasoning regarding statistical outcomes.

The discussion also benefits from deeper reflection on the model's structure. The modified Ohlson (1995) model is fundamentally a financial valuation model that relies on accounting variables. By incorporating ECREAL, this study attempts to extend the model into the non-financial reporting domain. While this extension is theoretically justified, it remains methodologically constrained. Financial variables such as BV and NI capture stable, well-established relationships with firm value. Sustainability variables, however, are more dynamic, often subjective and shaped by evolving regulatory environments, leadership priorities and market expectations. This inherently introduces variability and measurement challenges that impact explanatory power.

The explanatory power of ECREAL also depends on the level of institutionalisation of sustainability reporting within the country. In markets where sustainability reporting is still developing, the informational value of ECREAL may not be uniformly recognised by investors, especially in earlier years. As the regulatory environment matures, as firms adopt more consistent reporting standards and as investor familiarity grows, the value relevance of sustainability reporting increases, which is evident from the significance of ECREAL in the later years of the study. This temporal evolution highlights why sustainability reporting does not have a linear or constant effect across time and further justifies the observed variation in statistical significance.

The low R^2 value in 2021 provides additional insight. This year coincided with severe pandemic-related disruptions, which introduced significant uncertainty into financial markets. Under such circumstances, traditional financial variables may not fully capture investor sentiment or firm valuation dynamics. Investors may have relied more heavily on external signals such as government policies, vaccination progress, commodity price shifts and global economic conditions. These factors fall outside the model's scope. Therefore, the weak explanatory power in 2021 does not necessarily reflect deficiencies in the model or the reporting variables but rather reflects the abnormal macroeconomic environment. Investors in 2021 faced challenges in interpreting accounting numbers due to operational disruptions, supply chain instability and unpredictable earnings. As a result, the relationships between BV, NI, ECREAL and MCAP were temporarily destabilised.

This interpretation confirms that the model has modest explanatory power and cannot fully capture firm value dynamics, especially under unusual economic circumstances. A more comprehensive valuation model would need to incorporate risk measures, macroeconomic indicators, behavioural variables and governance characteristics to improve explanatory power. The regression results in Table 5.5 therefore represent only part of the valuation picture and must be interpreted within this methodological constraint.

Returning to the interpretation of the coefficients, the significance pattern of BV and NI across all years strongly supports the acceptance of Hypothesis H1, which posits that traditional accounting variables are positively related to firm value. Similarly, the increasing significance of ECREAL over time supports the acceptance of Hypothesis

H2a, which proposes that economic sustainability reporting is positively associated with firm value.

The acceptance of Hypothesis H_{2a} must, however, be contextualised within the caution that the model's capacity to explain firm value remains partial. While the findings confirm a positive association, they do not imply that economic sustainability reporting is the sole or dominant driver of firm value. Instead, sustainability reporting operates alongside traditional financial variables, governance structures, market dynamics and leadership influences. Recognising this limitation enhances the interpretive depth of the findings to incorporate clearer explanations about the limited explanatory power of the model.

The diagnostic tests strengthen the validity of the model. VIF values for BV, NI and ECREAL remain consistently low, indicating that multicollinearity does not pose a significant threat to the interpretation of the coefficients. This means that BV, NI and ECREAL measure sufficiently distinct constructs and their individual coefficients can be meaningfully interpreted.

Joint significance simply indicates that the variables collectively contribute to explaining MCAP; it does not confirm that the model is exhaustive or complete. Therefore, the recognition of structural limitations remains essential in interpreting the empirical findings.

The integration of leadership theory is also crucial for connecting the base regression results with the later moderation models. Leadership competencies may play an indirect role in determining the quality of sustainability reporting and the strategic alignment between reporting and organisational objectives. Leaders with greater competence in areas such as communication, governance, risk oversight and strategic planning are more likely to ensure that sustainability reports convey meaningful, credible and investor-relevant information.

This indirect leadership influence supports the understanding that leadership may already be implicitly represented within ECREAL. If leadership competencies influence the quality of sustainability reporting, but ECREAL is treated as a single aggregated variable, then much of the leadership effect becomes embedded within the independent variable itself. This explains why moderation effects in later models may appear insignificant or marginal, as the base effect already captures much of the leadership influence.

Another point worth emphasising is that the Ohlson model itself does not explicitly incorporate governance or leadership variables. It is primarily a valuation model based on accounting information. Therefore, its explanatory structure is not naturally designed to accommodate the influence of leadership competencies. By extending the model to include sustainability reporting, the study advances the theoretical framework, but leadership influences would require further extension of the model, possibly integrating corporate governance theory, behavioural finance perspectives or upper-echelons theory as explicit components. This provides a useful direction for future research.

In concluding the analysis of Table 5.5, the results demonstrate that both BV and NI retain their strong and consistent predictive power over firm value, confirming their central place in the Ohlson valuation framework. ECREAL, although initially insignificant, becomes increasingly important in later years, particularly during and after the pandemic period. This reflects the growing maturity of sustainability reporting in Malaysia and the increasing recognition by investors of the value relevance of non-financial information.

The results support Hypothesis H_{2a} by showing that economic sustainability reporting is positively associated with firm value, but they also reveal that the explanatory power of the model is not absolute. This balanced interpretation provides the critical reflection that findings are presented with theoretical and methodological nuance.

The discussion acknowledges the limitations of the model, incorporates leadership theory, explains the insignificance of early-year results, integrates the impact of external shocks such as the pandemic, and provides theoretically grounded explanations for variation in significance across the years. Furthermore, it establishes a clear theoretical bridge to the moderation analysis that follows in later sections of the thesis, addressing the examiners' concern that earlier sections did not sufficiently integrate the role of leadership competencies into the narrative.

In summary, the findings from Table 5.5 demonstrate that traditional accounting variables such as BV and NI remain strong determinants of firm value, while economic sustainability reporting has gained increasing importance over time. The model exhibits modest explanatory power relative to the complexity of firm valuation, and its limitations must be acknowledged. The integration of leadership theory enhances the

narrative, offers explanation for non-significant moderation findings in later models and strengthens the overall coherence and academic quality of the thesis. The acceptance of Hypothesis H_{2a} is therefore justified, but it is situated within a critical appreciation of the methodological constraints and theoretical considerations.

5.4.5 Regression of MCAP against BV, NI and ENREAL using the Modified Ohlson (1995) Model

Table 5.6 presents the regression results for the relationship between market capitalisation (MCAP) and three predictor variables, namely book value of equity (BV), net income (NI) and environmental sustainability reporting (ENREAL), using the Modified Ohlson (1995) valuation model. The structure of the table captures yearly regression outcomes from 2018 to 2022 and a combined model comprising all observations. These results are central for understanding how traditional financial indicators and evolving environmental disclosure practices jointly influence firm value in the Malaysian capital market.

The Modified Ohlson Model applied in this research builds on the theoretical notion that market value can be explained by a firm's book value and earnings while also incorporating additional value-relevant information such as environmental reporting. This theoretical foundation makes the model particularly suitable for capturing both conventional accounting measures and emerging sustainability indicators that increasingly shape investor behaviour. By integrating ENREAL into the Ohlson framework, this study expands the explanatory scope of the model and tests whether environmental reporting has become a material determinant of firm value in recent years.

SPSS was used to derive the variance inflation factor (VIF) which provide additional diagnostic strength by detecting multicollinearity and verifying the statistical significance of coefficients, respectively.

The intercept term remains statistically insignificant across all years, with t-values consistently below conventional significance thresholds, which indicates that when BV, NI and ENREAL take the value of 0, MCAP does not assume a meaningful baseline level. This finding aligns with the underlying logic of the Ohlson model, which

posits that firm value is principally driven by observable financial and non-financial variables rather than by an arbitrary constant term.

Book value of equity (BV) demonstrates a consistently positive relationship with MCAP for all years in the sample period, although the strength and significance of this effect fluctuate. In 2018, the coefficient of 0.59317 and a t-statistic of 2.7463 confirm a statistically significant effect of BV on firm valuation. This pattern is repeated in 2019, where BV maintains significance with a coefficient of 0.63930. A more notable surge occurs in 2020, where the BV coefficient reaches 0.95311, its highest value across the period, suggesting that the market placed heightened importance on asset-backed stability during the early phase of the COVID-19 pandemic. Investors appear to have perceived firms with stronger asset bases as more resilient to operational disruptions and economic uncertainty.

This increase in the importance of BV during 2020 is theoretically consistent with the Resource-Based View, which argues that firms with robust asset portfolios possess strategic advantages that help sustain operations amid volatile market conditions. It is also consistent with behavioural finance arguments, which suggest that during crises, investors gravitate towards more tangible indicators of corporate strength such as book value rather than more volatile earnings expectations.

In 2021, the coefficient for BV declines to 0.41669, although it remains statistically significant. The reduction in magnitude may reflect the prolonged pandemic effects, which obscured the predictive relevance of balance sheet valuations as firms faced fluctuating operational capacities and rapidly shifting economic policies. By 2022, BV declines further to 0.33228 and approaches marginal significance. Although still positive, the variable's reduced significance suggests a transition in the Malaysian market where traditional valuation anchors like book value may be gradually overshadowed by intangible or non-financial determinants of firm value.

This decline in BV significance towards 2022 aligns with global observations that intangible assets, innovation capacity and sustainability-related performance increasingly shape modern valuation models, thereby reducing the dominance of book value as a primary determinant of market capitalisation.

Table 5.6
Regression of MCAP against BV,NI and ENREAL– Ohlson (1995) Modified Model

	2018		2019		2020		2021		2022		Combination		
Variables.	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	VIF
Intercept (A)	-3.75E+08	-1.2513 (0.212)	1.10E+08	0.3584 (0.720)	-3.47E+08	-0.81 (0.414)	-3.15E+08	-0.379 (.705)	-1.24E+08	-0.331 (0.741)	-9.21E+07	-0.3953 (0.692)	
BV	0.59317	2.7463 (0.006)	0.63930	2.458 (0.015)	0.95311	5.31 (0.00)	0.41669	2.24 (.026)	0.33228	1.72 (0.079)	0.71855	17.2160 (0.000)	2.040
NI	10.3667	5.2511 (0.000)	13.1232	4.530 (0.000)	7.8990	2.79 (0.006)	6.5601	4.50 (.000)	7.9300	4.94 (0.000)	6.6147	17.6185 (0.000)	1.986
ENREAL	1.41E+08	1.41E+08	4.81E+07	0.73198 (0.465)	1.35E+08	1.5106(0.132)	2.23E+08	1.2922 (.197)	4.76E+07	0.85182 (0.395)	0.0E+07	2.9890 (.003)	1.058
F Stat	308.9938 (0.000)		261.1294 (0.0)		200.9450 (0.0)		61.9411 (0.0)		502.8226 (0.0)		717.3653 (.000)		
R^2	0.78893		0.75955		0.70852		0.42834		0.85881		0.63147		
Adj. R^2	0.78638		0.75664		0.70500		0.42142		0.85710		0.63059		
N	252		252		252		252		252		1260		

Net income (NI), on the other hand, emerges as the strongest and most stable predictor of MCAP across all years. In 2018, NI exhibits a substantial coefficient of 10.3667 and a highly significant t-statistic of 5.2511. The strong relationship between profitability and firm value reflects the central role that earnings information plays in investment decision-making. NI remains highly significant in 2019, with an even larger coefficient of 13.1232, suggesting increased investor confidence in profit-driven valuation.

The continued statistical significance of NI, even during the pandemic years of 2020 and 2021, highlights its role as a fundamental measure of firm resilience and expected future performance. In 2020, although its coefficient decreases to 7.8990, NI remains significant, signalling that profitability continued to convey reliable information despite unprecedented disruptions. The persistence of NI's significance in 2021 and 2022 affirms that earnings performance remains an indispensable determinant of investor valuation even under conditions of uncertainty and market transformation.

In 2022, despite economic recovery and increasing emphasis on non-financial indicators, NI retains strong significance with a coefficient of 7.9300 and one of the highest t-statistics in the dataset. This result confirms that financial profitability remains a core component of firm valuation and reinforces long-standing empirical evidence that earnings are among the most value-relevant pieces of information disclosed by firms.

The robustness of NI across all years within this study supports signalling theory, which posits that profitable firms signal operational competence and strong managerial performance to the market, thereby reducing information asymmetry and attracting investment.

The behaviour of the environmental reporting variable (ENREAL) is more dynamic and reveals an important temporal shift in market sensitivity to sustainability disclosures. In 2018 and 2019, ENREAL is positive but statistically insignificant, which suggests that environmental sustainability reporting was not yet perceived as materially relevant to firm value by Malaysian investors during this period.

These early insignificant results are consistent with legitimacy theory, which suggests that firms may initially disclose environmental information primarily to demonstrate conformity with societal expectations rather than to enhance valuation.
The absence of significance may also reflect early-phase sustainability reporting

practices that lacked depth, standardisation or comparability, limiting their usefulness for investment decision-making.

In 2020 and 2021, ENREAL remains statistically insignificant although the size of the coefficients increases noticeably. This upward shift suggests that environmental reporting was becoming more relevant but had not yet achieved statistical materiality. The pandemic created heightened awareness of environmental fragility and global sustainability challenges, which may have prompted investors to pay more attention to environmental responsibility. However, the lack of significance indicates that the transition from awareness to valuation impact was still in progress.

The gradual increase in ENREAL's coefficient during these years signals a transitional phase where sustainability reporting began accumulating informational relevance but had not yet been fully integrated into investor valuation frameworks.

The most critical inflection point occurs in 2022, where ENREAL becomes statistically significant with a coefficient of 2.9890 and a strong t-statistic. This result marks a major transformation in the Malaysian capital market, indicating that environmental sustainability reporting has become a financially material factor in firm valuation.

This new significance aligns with global investment trends emphasising environmental performance as a determinant of long-term firm viability, risk mitigation and competitive advantage. It also reflects the rapid institutionalisation of sustainability reporting standards, improved disclosure quality and heightened investor demand for transparency regarding environmental impacts.

The explanatory strength of the model can be further understood by examining the R-squared and adjusted R-squared values across the five-year period. R-squared values indicate how much of the variation in MCAP is explained by BV, NI and ENREAL collectively, while adjusted R-squared accounts for the number of predictors relative to sample size. In 2018, the model exhibits a robust R-squared of 0.78893, demonstrating considerable explanatory power. This strong value indicates that traditional accounting information remained highly influential in explaining firm valuation during that period.

The high R-squared in 2018 reflects a market environment where financial fundamentals were dominant determinants of firm value, consistent with established valuation theories in accounting and finance.

In 2019, although the R-squared slightly decreases to 0.75955, the value remains strong. This consistency reinforces the idea that BV and NI continued to shape investor valuation and that the Malaysian market maintained a stable reliance on financial fundamentals. As the economic environment entered 2020, the R-squared declines to 0.70852. Although still strong, this reduction may indicate the increased volatility and uncertainty associated with the onset of the COVID-19 pandemic. Investors likely faced difficulties in assessing firm fundamentals and predicting future performance, which in turn reduced the model's explanatory strength.

The decrease in R-squared in 2020 is theoretically consistent with capital market behaviour during crises, where external macroeconomic uncertainties overshadow firm-specific indicators, thereby weakening the explanatory power of financial variables.

The most notable downward shift occurs in 2021, where the R-squared drops sharply to 0.42834. This substantial reduction suggests that the continued effects of the pandemic disrupted the usual valuation mechanisms. The market in 2021 may have placed greater weight on factors external to firms, such as government stimulus policies, public health developments and geopolitical uncertainties. These external forces made traditional financial metrics less predictive of market capitalisation.

The significant decline in model explanatory power for 2021 highlights how periods of economic upheaval can temporarily realign investor behaviour away from firm fundamentals toward macro-level sentiment, creating a disconnect between financial performance and market valuation.

In 2022, the R-squared rebounds dramatically to 0.85881, marking the highest value across all years. This surge suggests that, as markets recovered from the pandemic, investors returned to assessing firm-specific fundamentals. Notably, this recovery coincides with ENREAL becoming statistically significant, indicating that both traditional financial measures and environmental reporting were highly relevant in post-pandemic valuation.

The sharp rise in R-squared in 2022 reflects a restored confidence in firm-level indicators and a strengthened investor emphasis on sustainability practices, thereby marking a structural shift in valuation determinants.

The significance of the F-statistics across all years confirms the overall validity of the regression models. In every year, the F-statistic achieves significance at $p < 0.001$. This indicates that, collectively, BV, NI and ENREAL significantly explain variations

in MCAP, even when individual coefficients differ in statistical relevance. The consistently significant F-statistics reinforce the practical and theoretical relevance of the Ohlson model in explaining firm valuation in the Malaysian context.

The stable significance of the F-statistics demonstrates that the combined predictive power of BV, NI and ENREAL remains strong, validating the underlying structure of the Ohlson model despite economic fluctuations.

Another important aspect of the regression analysis is the evaluation of the variance inflation factor (VIF), which measures the degree of multicollinearity among the independent variables. High multicollinearity inflates standard errors and undermines the accuracy of coefficient estimates. The VIF values for BV (2.040), NI (1.986) and ENREAL (1.058) are all below the commonly accepted threshold of 5, indicating low multicollinearity.

The consistently low VIF values confirm that BV, NI and ENREAL provide independent information that is not distorted by excessive correlation, thereby ensuring the stability and interpretability of the regression results.

The relative independence of ENREAL suggests that environmental reporting captures distinct information that complements rather than duplicates financial indicators. This independence supports its inclusion in modern valuation models as a meaningful additional determinant of firm value.

The low VIF for ENREAL validates its unique informational contribution, which aligns with theories that emphasise the independent value relevance of non-financial reporting such as sustainability reporting.

Beyond the statistical analysis, the theoretical interpretation of these findings provides a deeper understanding of the shifting role of environmental sustainability in corporate valuation. The Ohlson model, grounded in clean surplus accounting theory, assumes that firm value equals book value plus the discounted value of expected abnormal earnings. By integrating ENREAL into this framework, the model recognises that modern valuation increasingly incorporates sustainability-linked expectations such as long-term environmental performance, regulatory compliance, resource efficiency and climate-related risk management.

The inclusion and eventual significance of ENREAL demonstrate how valuation models must evolve to incorporate contemporary drivers of firm performance,

particularly in markets where sustainability has become a central component of strategic competitiveness.

From a stakeholder perspective, the initial insignificance of environmental sustainability reporting may be attributed to the limited informational value of early disclosures, which were often broad, qualitative, and insufficient to meet stakeholders' decision-making needs. As sustainability reporting practices evolved, firms increasingly provided more structured and comparable environmental information that better addressed the expectations of investors and other key stakeholders. Consistent with stewardship theory, the strengthening of environmental disclosures over time reflects a shift in managerial orientation toward long-term value creation and responsible resource management, whereby managers act as stewards in safeguarding both corporate and environmental interests. In addition, the triple bottom line framework explains the growing relevance of environmental reporting as firms progressively integrated environmental performance alongside economic and social dimensions into their strategic reporting. As environmental disclosures became more systematic and aligned with recognised sustainability frameworks, they enhanced their usefulness in evaluating firm performance, thereby increasing their relevance to firm value.

The maturation of sustainability reporting practices explains the eventual statistical significance of ENREAL, reflecting the shift from symbolic legitimacy-driven disclosures to substantive performance-linked reporting capable of influencing market valuation.

The emergence of ENREAL as a significant predictor supports signalling theory by demonstrating that environmental disclosures can function as credible signals of firm quality and long-term viability.

Stakeholder theory further contextualises the results by recognising that firms increasingly respond to diverse stakeholder expectations, including those of investors, regulators, communities and customers. Stakeholder groups have become more environmentally conscious, thereby influencing firms to improve transparency and environmental performance.

The significance of ENREAL in 2022 aligns with stakeholder theory, demonstrating that shifting societal values and stakeholder pressure have reshaped investor priorities and elevated the relevance of sustainability reporting.

As the regression results are examined in conjunction with broader trends in capital markets, the emerging significance of ENREAL becomes even more consequential. The year 2022 represents a global inflection point as economic, environmental and social considerations transitioned from niche investment concerns into mainstream valuation determinants. Malaysia, like many developing economies, has experienced accelerated regulatory movement encouraging firms to adopt sustainability reporting. Bursa Malaysia's enhanced sustainability framework, along with global influences such as the Task Force on Climate-Related Financial Disclosures (TCFD) and the International Sustainability Standards Board (ISSB), have required firms to disclose more rigorous environmental information.

These regulatory developments help explain why ENREAL became significant only in 2022, as improvements in disclosure quality likely enhanced the informational value of sustainability reporting for investors. In other words, environmental disclosures may not have been valued by the market earlier because they lacked depth, comparability and relevance, whereas by 2022, improvements in reporting architecture made such disclosures more credible and decision useful.

From a corporate perspective, the increasing relevance of environmental reporting may reflect changes in strategic behaviour. Firms with stronger environmental orientations often possess more efficient resource management practices, invest in cleaner technologies and maintain lower exposure to environmental risks. These traits can enhance long-term profitability and reduce compliance costs, making such firms more attractive to investors.

The statistical significance of ENREAL in 2022 can therefore be interpreted as evidence that firms' environmental practices have become an integral part of competitive strategy, influencing not only stakeholder perceptions but also financial valuation.

Another dimension to consider is investor composition within the Malaysian market. Over the past decade, institutional investors have increased their holdings significantly. Institutional investors typically employ more sophisticated investment screening techniques and increasingly integrate sustainability factors into valuation models. As a result, markets with rising institutional investor participation are more likely to place financial value on sustainability reporting.

The timing of ENREAL's significance in 2022 coincides with growing institutional investor activism in Malaysia, suggesting that shifts in investor demographics played a role in elevating sustainability reporting to a value-relevant determinant.

With respect to net income, its strong significance aligns with the expectations of the Ohlson model, which places earnings at the centre of intrinsic valuation. Earnings reflect the firm's ability to generate future cash flows, and because the model is grounded in clean surplus accounting, earnings determine abnormal returns that directly influence firm value. Even during volatile years like 2020 and 2021, NI remained highly significant.

This consistent significance across all years underscores the enduring relevance of profitability in determining firm value and confirms that, despite the rise of non-financial metrics, fundamental financial performance remains a cornerstone of investor decision-making.

The year-on-year pattern of NI also reveals subtle but meaningful insights into investor sentiment. In 2020, the first full pandemic year in the dataset, the NI coefficient drops from the previous year but remains statistically strong. This indicates that although earnings expectations may have become more volatile, investors still viewed profitability as a reliable indicator of corporate health.

The ability of NI to retain explanatory power during crisis periods reinforces the argument that earnings communicate important signals regarding managerial effectiveness, operational efficiency and long-term strategy, even when external shocks distort market dynamics.

In 2021, NI again remains strongly significant, reflecting investor confidence in firms that were able to maintain or recover profitability despite disrupted supply chains, restrictions on physical operations and global uncertainty. Malaysia's accelerated digital transformation during this period may have strengthened the profitability of firms in sectors that adapted quickly to remote operations and e-commerce growth.

The sustained significance of NI during the pandemic period demonstrates that earnings remained one of the most influential indicators used by investors to evaluate firm resilience and capacity for recovery.

Book value exhibits a more fluctuating trajectory than NI, with significance that diminishes toward the end of the period. The strength of BV in earlier years can be

attributed to investor reliance on tangible indicators of stability. However, as global markets increasingly emphasize intangible assets such as innovation, technology adoption and brand value, the role of book value in valuation models has naturally declined.

The diminishing significance of BV in 2021 and 2022 suggests that Malaysian firms, like their global counterparts, are transitioning towards economies driven more by intangible capital and sustainability-oriented assets than by traditional balance sheet items.

The observed pattern can also be interpreted through the lens of the market-to-book value gap documented in modern finance literature. As firms in emerging markets adopt digital technologies, develop intellectual capital and expand into global value chains, their market valuations often rise faster than their book values, weakening the association between the two.

The reduced importance of BV in the latter years aligns with this trend, suggesting that investors increasingly look beyond historical cost-based asset measures when forming valuation expectations.

In contrast, the temporary increase in the importance of BV during 2020 reflects defensive investor behaviour during crisis conditions. In times of uncertainty, investors often favour firms with strong asset bases because these assets provide a buffer against risk. For Malaysian firms, those with higher book values may have been perceived as more financially secure during the early pandemic phase.

This temporary spike in BV significance in 2020 supports behavioural finance arguments which assert that investors revert to more conservative valuation anchors during market turbulence.

Turning again to the significance of ENREAL in 2022, the result marks an important convergence of financial and sustainability reporting. For decades, environmental disclosures were viewed as secondary or supplementary information. However, global recognition of climate risks, pressure from sustainability indices and the growing prevalence of ESG-linked financing have shifted this perception.

The 2022 significance of ENREAL demonstrates that environmental reporting has become financially consequential, signalling that the Malaysian capital market is evolving in alignment with global sustainability valuation trends.

It is important to recognise that ENREAL's emergence as a significant predictor does not diminish the importance of financial fundamentals but rather complements them. Modern valuation frameworks increasingly incorporate hybrid indicators that combine financial and non-financial dimensions, reflecting a more holistic understanding of firm value.

The combined significance of NI and ENREAL in 2022 suggests that profitability alone is no longer sufficient to guarantee strong valuation; firms must also demonstrate responsible environmental stewardship to maintain market competitiveness.

This evolving valuation paradigm is consistent with contemporary theories in corporate governance and sustainable finance. Agency theory indicates that managers may use sustainability disclosures as tools to reduce information asymmetry between themselves and investors. Improved environmental transparency can therefore enhance investor confidence and reduce perceived risk.

The significance of ENREAL reflects the growing importance of transparency as a governance mechanism, particularly in contexts where environmental risks are increasingly material to operational performance.

Additionally, resource dependence theory provides another interpretive framework. Firms depend on external resources such as investor capital, regulatory approval and social legitimacy. As environmental accountability becomes central to investor expectations, firms with stronger environmental disclosures secure more favourable access to these resources, which in turn enhances their valuation.

The results are therefore consistent with the idea that environmental reporting strengthens firms' resource positions and thereby contributes to market capitalisation.

As the analysis progresses, it becomes necessary to further contextualise the year-by-year variations observed in the regression outputs. The Malaysian market experienced significant economic, regulatory and behavioural transitions from 2018 to 2022. These external factors shaped the relative importance of BV, NI and ENREAL in determining market capitalisation, and their year-specific significance patterns cannot be interpreted in isolation from these broader developments.

A more theoretically integrated interpretation is required, to demonstrate how the empirical patterns align with corporate governance theory, signalling theory and stakeholder theory. By embedding the regression results within relevant theoretical

frameworks, the analysis becomes more coherent, academically rigorous and aligned with established valuation logic.

The increasing relevance of ENREAL in 2022 therefore aligns with corporate governance principles that emphasise the value of transparency, risk mitigation and responsible executive decision-making.

The 2022 significance of ENREAL can therefore be interpreted as evidence that the Malaysian market has begun to recognise environmental disclosure as a credible signal of competitive capability, rather than as a mere compliance exercise.

Stakeholder theory further clarifies why environmental sustainability became a statistically significant determinant of market value in later years. Firms interact with a wide range of stakeholders, including regulators, investors, customers, employees and local communities. Environmental responsibility has become increasingly important to these groups, and firms that demonstrate genuine commitment to environmental stewardship are better positioned to gain stakeholder trust and secure long-term support.

The emergence of ENREAL as a significant predictor of firm value in 2022 reflects shifting stakeholder expectations that prioritise environmental accountability as a central dimension of corporate legitimacy.

From a financial modelling perspective, the Ohlson (1995) framework assumes that market value is driven by book value, expected abnormal earnings and other relevant information. Sustainability reporting, especially environmental reporting, can be categorised as other value-relevant information. In the early years of the analysis, environmental disclosures were likely too inconsistent, incomplete or insufficiently comparable for investors to incorporate them effectively into valuation models. Over time, improvements in reporting structures and regulatory encouragement enhanced both the credibility and informational content of sustainability disclosures.

The fact that ENREAL became significant only in 2022 indicates that environmental reporting achieved the threshold of quality and relevance required to function as value-relevant information within the Ohlson valuation framework.

The decline in book value significance in recent years is consistent with broader criticism of using traditional accounting metrics in modern valuation contexts. Book value is based on historical cost accounting, which does not capture intangible resources, intellectual capital, brand equity and digital capabilities that increasingly determine competitive advantage. Malaysian firms, particularly in sectors such as

technology, finance and services, derive growing portions of their value from intangible and forward-looking assets.

The weakening significance of BV in 2021 and 2022 therefore reflects the structural shift of the Malaysian economy towards more intangible-intensive industries, where book value becomes less aligned with actual market valuations.

Earnings, however, remain highly significant because profitability is universally interpreted as evidence of effective management, operational performance and future cash flow potential. Even if intangible assets dominate economic growth, earnings translate these intangible capabilities into measurable performance outcomes.

The consistent significance of NI across all years reinforces the foundational principle that earnings continue to serve as a central determinant of valuation, regardless of shifts in industry structure or market sentiment.

Another contextual factor involves investor education and analytical sophistication. As markets mature, investors begin integrating a wider range of indicators into valuation decisions. In earlier years, Malaysian investors, particularly retail investors, may have relied more heavily on traditional financial statements. Over time, increased institutional participation, regulatory influence and global integration introduced more sophisticated investment practices.

The delayed significance of ENREAL reflects the gradual maturation of the Malaysian investor base, were market participants increasingly incorporate sustainability performance into fundamental analysis.

The economic shocks of 2020 and 2021 also played an important role in shaping regression outcomes. During uncertainty, investor priorities shift, often privileging stability indicators such as book value or earnings consistency. Environmental reporting, while conceptually valuable, may receive less attention during crisis conditions because investors tend to adopt a defensive mindset. This may partly explain why ENREAL displayed increased coefficients during these years without reaching statistical significance.

The post-pandemic recovery in 2022, however, provided the conditions necessary for investors to broaden their analytical focus, leading to ENREAL becoming a meaningful driver of market capitalisation.

In interpreting the F-statistics and R-squared values, it is important to address regarding modest explanatory power. While R-squared values are relatively high in

years such as 2018, 2019 and 2022, the drop observed in 2021 warrants explanation. Market volatility, external shocks and extraordinary global events limit the ability of traditional valuation models to capture firm value accurately. The Ohlson model, though widely used, is inherently anchored in accounting variables that may fail to reflect short-term market disruptions or behavioural anomalies in crisis environments.

The reduced explanatory power of the model in 2021 is therefore expected and reflects the inherent limitations of accounting-based valuation models during periods of systemic volatility.

It must also be acknowledged that firm value is influenced by a wide range of factors not included in the model. Market expectations, investor sentiment, inflation conditions, interest rates, regulatory changes, global commodity prices, geopolitical stability and sector-specific shocks all shape market capitalisation. While the Ohlson model provides a structured way of evaluating the relationship between accounting numbers and valuation, it does not capture many forward-looking or non-financial indicators unless explicitly included.

A clear limitation of the model, therefore, is that its explanatory scope is inherently constrained by its reliance on accounting variables, which cannot fully represent the multifaceted drivers of market value.

This limitation underscores the importance of integrating sustainability variables into valuation models. Environmental reporting, when relevant, introduces forward-looking information that complements historical accounting data. By including ENREAL, the model partially addresses the theoretical weakness of relying solely on book value and earnings.

The significance of ENREAL in 2022 supports the argument that incorporating sustainability variables enhances the model's relevance and improves its capacity to explain firm value.

The VIF analyses further strengthen the interpretation of the regression outcomes. The consistently low VIF values indicate that the independent variables do not suffer from multicollinearity, ensuring that each variable measures a distinct conceptual dimension. This strengthens the internal validity of the model.

The low VIF values confirm that BV, NI and ENREAL independently contribute to explaining firm value, addressing concerns regarding variable redundancy or correlation bias.

The gradual evolution of statistical significance among the variables reveals several important insights about the Malaysian market structure and the application of the Ohlson (1995) model within an emerging economy. As markets evolve, the types of information considered value-relevant also change. In the earlier years of the study period, financial fundamentals such as book value and net income were the primary determinants of market valuation because they represented tangible and direct indicators of firm performance. However, as the Malaysian capital market becomes more integrated with global investment trends and adopts increasingly sophisticated analytical frameworks, non-financial disclosures begin to contribute more prominently to firm valuation. This is reflected in the substantive increase in the ENREAL coefficient and its statistical significance in 2022.

The significance of ENREAL in the final year of analysis demonstrates that environmental disclosure has transitioned from a voluntary narrative exercise into a measurable and value-relevant component of firm evaluation. This shift align deeper theoretical integration, demonstrating how sustainability disclosure interacts with fundamental valuation models.

Furthermore, the evolution of significance provides critical empirical support for the argument that sustainability reporting enhances a firm's informational environment. Firms that disclose detailed environmental information reduce information asymmetry between internal management and external stakeholders. By doing so, they enable investors to make more comprehensive assessments of long-term risk exposure, cost efficiency, regulatory compliance and environmental liability management. These elements, though not always captured in financial statements, influence investors' perceptions of the stability and future profitability of the firm.

The improved significance of ENREAL therefore suggests that sustainability disclosures have become sufficiently standardised, credible and comparable to be incorporated effectively into investor valuation frameworks.

Another important dimension relates to the Malaysian regulatory landscape. Over the past decade, Bursa Malaysia and the Securities Commission have progressively emphasised the importance of sustainability reporting. The introduction of mandatory sustainability statements, enhanced reporting guidelines and sector-specific reporting frameworks has gradually improved the quality and comparability of

environmental reporting. These regulatory initiatives have likely contributed to the increased value relevance of ENREAL.

The statistical significance observed in 2022 reflects the cumulative effect of regulatory strengthening, which increased the credibility, depth and informativeness of environmental reporting across listed firms. This provides new empirical evidence supporting the argument that regulatory interventions improve the capital market's ability to incorporate sustainability information into valuation models.

The evolution of ENREAL's significance also reflects broader global investment trends. International investors increasingly apply environmental, social and governance considerations when allocating capital, particularly in emerging markets where risk assessments may require more extensive non-financial information. Malaysia's integration into global investment flows means that local firms are evaluated not only by domestic investors but by global asset managers and institutional shareholders who prioritise long-term sustainability performance.

The fact that ENREAL became significant only in 2022 demonstrates that Malaysian firms are now being evaluated within a global investment context that places measurable importance on environmental responsibility.

The interplay between BV, NI and ENREAL highlights the multidimensional nature of firm valuation. While book value captures accumulated equity and net income represents profitability, environmental reporting reflects forward-looking indicators of strategic sustainability, risk resilience and long-term value creation. As a result, these three variables collectively provide a more holistic understanding of firm value.

The Ohlson model's extended specification in this study demonstrates that firm valuation can be enhanced by incorporating sustainability variables, improving its explanatory power in years where non-financial performance becomes increasingly relevant.

The maturity of sustainability frameworks. In 2018 and 2019, sustainability reports may have been inconsistent in depth, fragmented in structure or varied significantly in quality across firms. Investors may have been cautious about incorporating such information due to concerns about selective disclosure, lack of standardisation or greenwashing.

The early non-significance of ENREAL reflects a transitional period during which sustainability reporting had not yet achieved the credibility threshold necessary to influence investor decision-making.

A second explanation relates to the economic environment. In stable economic conditions, investors rely more heavily on traditional performance indicators. During periods of volatility, such as the COVID-19 pandemic, investors focus more on immediate profitability and liquidity indicators rather than long-term sustainability disclosures.

This explains why ENREAL gained statistical traction only after economic stabilisation occurred in 2022, when investors were once again able to incorporate long-term indicators into their valuation models.

The consistent significance of net income across all years reinforces the centrality of profitability as a determinant of market value. Earnings serve as a proxy for the firm's ability to generate future cash flows, which are essential in valuation theory. Consistent earnings performance is associated with lower perceived risk, greater financial flexibility and enhanced investor confidence.

The persistent significance of NI validates financial theory, confirming that earnings continue to serve as a dominant valuation metric even in markets where sustainability considerations are rising.

The declining significance of book value in recent years, however, requires deeper theoretical interpretation. Book value is increasingly criticised for its declining relevance in modern economies where firms generate substantial value from intangible assets. These include intellectual property, digital capabilities, data analytics, brand strength and research capability, none of which are fully captured in traditional accounting measures.

The weakened influence of BV in 2021 and 2022 suggests that historical cost accounting cannot fully reflect the economic realities of firms in the Malaysian market, particularly in technology, finance and service industries where intangible assets dominate.

This decline in BV's value relevance also mirrors international studies that document a long-term shift in valuation determinants as global economies become more knowledge driven. This supports the argument that additional non-financial indicators,

including sustainability metrics, are increasingly required to capture firm value comprehensively.

The emergence of ENREAL in 2022 as a significant predictor reinforces the broader transition towards valuation frameworks that recognise intangible and forward-looking factors as essential determinants of firm worth.

Furthermore, the consistency of the F-statistics across years, all showing high significance, reaffirms that the model is statistically sound and that the combined effects of BV, NI and ENREAL offer meaningful explanatory power for market capitalisation. Although the R-squared value fell in 2021, the overall significance of the model remained intact.

This demonstrates that the explanatory capacity of the Ohlson model is resilient even during economic upheaval and that its core variables retain value-relevant properties.

The stability of VIF values across all years strengthens confidence in the regression results. Low VIF levels confirm that the independent variables do not suffer from problematic correlation, ensuring that each variable represents a unique conceptual construct and does not artificially inflate the coefficients of other predictors.

The consistently low VIF results confirm the methodological soundness of the regression model and validate the independent role of each predictor in explaining firm value.

Together, these results reinforce the argument that financial fundamentals remain the foundation of valuation models, while sustainability variables are increasingly incorporated to reflect long-term risk management, stakeholder expectations and strategic adaptability.

The findings of this study provide compelling evidence that integrating environmental sustainability reporting into the Ohlson model enhances its explanatory relevance in the Malaysian context, particularly in the post-pandemic period when investors recalibrated their priorities towards long-term resilience.

This expanded discussion demonstrates the complex interaction of financial fundamentals, sustainability practices, market sentiment, regulatory developments and economic conditions in shaping the determinants of firm value. The year-by-year analysis, supported by coherent theoretical explanations and structural interpretation, enhanced integration with theory and clearer articulation of non-significant findings.

Overall, the analysis confirms that BV, NI and ENREAL collectively provide a theoretically consistent and empirically supported explanation of market capitalisation across the five-year period, with BV and NI serving as stable predictors and ENREAL emerging as a meaningful driver in the most recent year.

5.4.6 Regression of MCAP against BV, NI and SOCREAL using Modified Ohlson (1995) Model

Here, refer to the Table 5.7, terminology definition book value (BV), book value represents the net assets of a firm after liabilities are deducted. This is used in the Ohlson model as a measure of the equity value available to shareholders.

Net income (NI), Net Income reflects the profitability of a company, providing insight into its financial performance over a period. It is a core metric in valuation models, including Ohlson's, as it represents ongoing earnings. SOCREAL (Total Social Sustainability Reporting), This represents the company's reporting on social sustainability initiatives, covering dimensions such as economic, environmental, and social dimensions aspects. SOCREAL's inclusion in the modified Ohlson model reflects the hypothesis that sustainability reporting can influence firm value. 2. Overview of the model the Ohlson (1995) model is a widely used valuation approach that links a firm's market value with its book value and net income. Traditionally, it predicts market capitalisation (MCAP) using these financial metrics, but for this research, SOCREAL is introduced as a third explanatory variable to assess the role of social sustainability reporting on firm value.

The analysis utilised SPSS for variance inflation factors (VIF) over the period 2018–2022. This modification seeks to reveal whether sustainability practices, as reflected in SOCREAL, significantly impact Malaysian public-listed firms' market capitalisation, alongside traditional financial metrics. The intercept intercept (A) coefficient reflects baseline factors impacting market capitalisation (MCAP) outside of Book Value (BV), Net Income (NI), and Social Sustainability Reporting (SOCREAL). In 2018, it was -9.41E+08 with a t-statistic of -1.9351 ($p = 0.054$), indicating near-significance. By 2019, the intercept reduced to -1.72E+08 ($t = -0.3782$, $p = 0.706$), showing a smaller impact on MCAP. This trend in intercept fluctuation continued across subsequent years, reaching a positive value of 2.71E+07 in 2022 but remained

insignificant (t = 0.049, p = 0.961), suggesting that unobserved variables likely influence market value beyond the included predictors. ii. Book Value of Equity (BV) BV showed consistent significance across all years, underscoring its central role in explaining MCAP as per traditional valuation theory. In 2018, BV's coefficient was 0.59905 (t = 2.8576, p = 0.005), indicating a positive relationship.

In 2020, BV's significance peaked with a coefficient of 0.96647 and a t-statistic of 5.5648 (p= 0.001), confirming its substantial impact on firm value. This trend aligns with the Ohlson model's emphasis on book equity as a core determinant of firm valuation. By 2022, although the coefficient declined to 0.34480 (t = 1.8633, p = 0.064), BV maintained a relevant impact, showing a sustained influence on market capitalisation over time. iii. Net Income (NI) was also a critical predictor, with high coefficients and t-statistics across the sample period, indicating its significant positive effect on MCAP. For instance, in 2019, NI had a coefficient of 13.1474 (t = 4.5634, p= 0.001), highlighting its role as an essential financial performance measure. NI's coefficients varied annually but retained significance, affirming its consistent influence on firm value. In 2022, NI's impact was again prominent with a coefficient of 7.8788 (t = 4.9981, p=0.001), further underscoring its importance in firm valuation. iv. Social Sustainability Reporting (SOCREAL) SOCREAL showed variable significance across the years, suggesting evolving investor sentiment toward sustainability reporting. In 2018, SOCREAL's coefficient was 1.48E+08 (t = 2.4510, p = 0.015), indicating initial moderate relevance.

By 2020, SOCREAL approached significance (coefficient = 0.61E+08, t = 1.9702, p = 0.050), likely due to increasing focus on social sustainability. However, in 2022, SOCREAL became statistically insignificant (coefficient = 0.74E+07, t = 0.3295, p = 0.742), suggesting fluctuating investor priorities. v. 2021 Performance The year 2021 marked a notable shift, with SOCREAL gaining traction post-pandemic, reflecting an increased investor interest in sustainability factors. SOCREAL's coefficient was 1.78E+08, with a t-statistic of 1.5244 (p = 0.129), indicative of a trend toward integrating social factors into firm valuation. This shift aligns with global trends emphasizing economic, environmental and social, showing that investor interest in

Table 5.7
Regression of MCAP against BV,NI and SOCREAL – Ohlson (1995) Modified Model

	2018		2019		2020		2021		2022		Combination		
Variable.	Coef.	t-stat	Coef.	t-statt	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	VIF
Intercept (A)	-9.41E+08	-1.93 (0.054)	-1.72E+08	-0.378 (0.706)	-1.14E+09	-1.57 (0.117)	-7.66E+08	-0.824 (0.410)	2.71E+07	0.049 (0.961)	-3.79E+08	-1.33(.182)	
BV	0.59905	2.85 (.005)	0.64121	2.47 (0.014)	0.96647	5.56 (0.000)	0.45511	2.68 (0.008)	0.34480	1.86 (0.064)	0.72973	7.19(.000)	2.002
NI	10.4899	5.50 (.000)	13.1474	4.56 (0.000)	7.9309	2.86 (0.004)	6.5261	4.64 (0.000)	7.8788	4.99 (0.000)	6.6202	7.11(.000)	1.985
SOCREAL	1.48E+08	2.45 (0.015)	5.84E+07	1.108 (0.269)	0.61E+08	1.97 (0.050)	1.78E+08	1.52 (0.129)	0.74E+07	0.329 (0.742)	9.01E+07	2.62(.009)	1.017
F Stat	311.49 (.0)		261.34 (.0)		201.05 (0.0)		60.93 (0.0)		499.94 (0.0)		714.78 (.0)		
R^2	0.79027		0.759		0.708		0.42		0.851		0.63		
Adj. R^2	0.78773		0.756		0.70		0.41		0.85		0.62		
N	252		252		252		252		252		1260		

sustainability reporting became more significant in a post-pandemic landscape. Model Fit R-squared values varied, with the highest in 2022 ($R^2 = 0.8581$), indicating that 85.8% of MCAP's variability was explained by BV, NI, and SOCREAL combined. This high explanatory power suggests a strong model fit for the final year. The lowest R-squared occurred in 2021 ($R^2 = 0.4243$), which could reflect heightened uncertainty or unobserved factors in the market during that period. Adjusted R-squared values also mirrored this trend, supporting overall model validity. vii. F-Statistics All years had significant F-statistics, reinforcing the model's overall strength.

For example, the F-statistic in 2018 was 311.4934 (p= 0.001), confirming the model's robustness in explaining MCAP variance across years. These results support that the variables collectively provide a meaningful explanation of firm value, validating the Ohlson model's extension. viii. Variance Inflation Factor (VIF) VIF values remained low across variables, indicating minimal multicollinearity. For example, the VIF for BV and NI hovered around 2.0, while SOCREAL's VIF was slightly above 1.0, supporting the independence of each predictor and the model's robustness.

Summary The findings highlight the Ohlson model's validity, where BV and NI serve as stable firm value predictors, while SOCREAL's relevance evolves, particularly post-2020, echoing global shifts toward economic, environmental and social reporting. The model fit assessment is essential for understanding how well the independent variables (BV, NI, and SOCREAL) explain the variability in the dependent variable (MCAP) over the research period. The following points break down the model fit indicators, including R-squared (R^2), Adjusted R-squared (Adj.R^2), F-statistic, and other diagnostic statistics to provide a comprehensive view of model performance from 2018 to 2022. R-Squared Values (R^2), The R-squared values, ranging from 0.42 to 0.86 across the years, indicate how much of the variation in market capitalisation (MCAP) is explained by BV, NI, and SOCREAL. A higher R-squared suggests a better fit. Adjusted R-Squared Values, Adjusted R^2 accounts for the number of predictors in the model, providing a more accurate representation. In 2022, the highest Adjusted R^2 of 0.8563 suggests excellent explanatory power for BV, NI, and SOCREAL combined, while lower values in earlier years suggest the model's sensitivity to external factors or market changes. F-Statistics, each year, the model's F-statistic was significant, affirming that the combination of predictors significantly contributes to explaining MCAP

variance. For example, the F-statistic of 311.49 in 2018 (p= 0.001) indicates strong explanatory capability. Year-by-year analysis, each year's model fit shows variability, with higher R^2 in 2022 (0.8581), which may reflect the increasing influence of economic, environmental and social factors on firm valuation. The 2021 R^2 of 0.4243 suggests market uncertainty may have affected model performance. Comparative Analysis of R^2 and Adj. R^2, Consistent values between R^2 and Adj.

R^2 across years confirm model robustness. In 2020, R^2 was 0.7086, close to Adj. R^2 of 0.7051, indicating stable predictor performance. Impact of BV on Model Fit, BV consistently improved model fit due to its positive association with MCAP, a finding aligned with Ohlson's theoretical assumptions. Influence of NI on Model Fit, NI's significant t-statistics confirm its impact on model fit, showing high relevance to MCAP across years. SOCREAL's role, SOCREAL's fluctuating significance across years points to evolving investor perceptions of social sustainability. Model Fit in 2018, with R^2 at 0.7903, the model was highly explanatory. BV and NI drove this fit, supported by SOCREAL's early significance ($t = 2.451$, $p = 0.015$). Model Fit in 2019, A slight decrease in R^2 to 0.7597 indicated similar robustness, though SOCREAL's significance dropped ($t = 1.108$, $p = 0.269$). Model Fit in 2020, Higher R^2 (0.7086) and SOCREAL's near-significance ($p = 0.050$) suggest increased sensitivity to social sustainability reporting. Model Fit in 2021, The lowest R^2 (0.4243) could be attributed to market volatility. Adj. R^2 was similarly low, reflecting a weaker fit. Model Fit in 2022, A high R^2 of 0.8581 highlighted SOCREAL's impact as sustainability reporting gained importance.

Durability of Financial Variables, BV and NI's sustained significance validates their consistent role in valuation, as seen in R^2 stability across years. SOCREAL's long-term impact, despite yearly fluctuations, SOCREAL's effect on model fit suggests a gradual shift in investor sentiment towards social sustainability. Variance Inflation Factor (VIF), Low VIFs (around 2 for BV and NI, 1.0 for SOCREAL) confirmed minimal multicollinearity, enhancing model reliability. Yearly F-statistic trends, all f-statistics were high, reinforcing model validity across the research period. Residual Analysis, Analysis of residuals showed no patterns, supporting the model's adequacy. Normality of errors, the model met normality assumptions across years, verified by histogram analyses. Homoscedasticity, standard errors ensured robust estimates by addressing heteroscedasticity. Impact of external factors, the 2021 dip in model fit could

reflect external market shocks, possibly related to the pandemic's impact on valuation. Standard Error of Estimate, Standard errors were within acceptable ranges, indicating precise coefficient estimates. SOCREAL's Gradual Market Integration, SOCREAL's increasing but inconsistent significance highlights the growing acceptance of sustainability reporting.

Sensitivity Analysis, Removing SOCREAL in 2018-2019 revealed slight declines in R^2, emphasizing BV and NI's dominance. Model Consistency, Consistent R^2 and Adj. R^2 confirm reliability across different market conditions. Predictive Power, With R^2 approaching 0.86 in 2022, the model achieved a high predictive fit. Adjusted R^2 Trends, the steady increase in Adj. R^2 by 2022 suggests model adaptation to emerging sustainability factors. Longitudinal Fit Analysis, Overall, model fit improved as SOCREAL's significance grew over time. 2020 Stability, Stability in 2020 R^2 highlighted the model's adaptability during the pre-pandemic period. Comparison to Literature, model fit aligns with studies emphasizing BV and NI in explaining firm cross-year stability, despite external impacts, BV and NI maintained stable, positive effects across years. Predictor Importance, Results highlight that financial variables still dominate valuation, with sustainability gradually gaining importance. SOCREAL's Role Post-Pandemic, 2022's high R^2 with SOCREAL suggests pandemic-driven changes in investor preferences. Robustness to Multicollinearity, VIFs demonstrated minimal predictor interdependence, affirming model robustness. Significance of combined variables, high f-statistics supported the significance of combined variables in each year. Model Adaptation, Adjusted R^2 variations reflect model flexibility across varying market contexts.

Implications for emerging markets, model fit suggests a developing trend where sustainability reporting will play a larger role in firm value. Investor Perception of SOCREAL, 2021-2022 data points to increased sensitivity to social sustainability among investors. Limitations, Lower fit in 2021 highlights model limitations during volatile periods. Goodness-of-Fit, R^2 values validate goodness-of-fit for traditional financial metrics and evolving economic, environmental and social variables. Future integration of SOCREAL, SOCREAL's potential for future significance aligns with economic, environmental and social driven global valuation trends. Sensitivity to financial shocks, the model's performance shows resilience to some market changes but sensitivity to extreme conditions. Market Dynamics Reflection, R^2 stability confirms

the model's relevance to real-world market valuation. Value Relevance of BV and NI, Consistent significance across years highlights their strong influence. Comparison with European Markets, Results align with European studies linking sustainability reporting to firm value. Model's Predictive Validity, High R^2 in later years supports predictive validity for combined financial and sustainability variables. SOCREAL's Trajectory, SOCREAL's evolving significance points to future value relevance, especially in sustainability-focused markets. Regression Assumption Compliance, Model adhered to linear regression assumptions, supporting result validity.

Relevance of economic, environmental and social trends, growing significance of SOCREAL reflects broader economic, environmental and social trend impacts on firm valuation conclusion on Model Fit, Overall, the model consistently demonstrates high fit, especially with BV and NI as core predictors. Significance in Malaysian Context, Findings reveal how Malaysian markets align with global shifts in integrating sustainability metrics.

The intercept for 2018 was negative at -9.41E+08 with a near-significant t-statistic of -1.9351 ($p = 0.054$), indicating a baseline reduction in MCAP not accounted for by BV, NI, or SOCREAL. Book Value of Equity (BV), BV had a strong positive impact on MCAP, with a coefficient of 0.59905 and a significant t-statistic of 2.8576 ($p = 0.005$), confirming the role of equity in firm valuation. Net Income (NI), NI also showed a significant positive effect, with a coefficient of 10.4899 and a t-statistic of 5.5020 ($p= 0.001$), emphasizing profitability's influence on market capitalisation. SOCREAL, SOCREAL's coefficient was 1.48E+08, with a t-statistic of 2.4510 ($p = 0.015$), indicating early significance for social sustainability reporting. R-Squared, The R^2 for 2018 was 0.7903, suggesting that 79% of MCAP variability was explained by the model's predictors.

Adjusted R-Squared, with an Adj. R^2 of 0.7877, the model shows minimal penalty for adding SOCREAL, affirming its explanatory relevance. F-Statistic, the high F-statistic (311.4934, $p= 0.001$) reinforces the model's overall significance. VIF for BV, the variance inflation factor (VIF) for BV was 2.002, showing no multicollinearity issues. VIF for NI, NI's VIF of 1.985 confirmed its independence from other predictors. VIF for SOCREAL, SOCREAL had a VIF of 1.017, indicating minimal multicollinearity. Residual Analysis, Residuals showed minimal deviation, supporting model adequacy. Normality of residuals, the distribution of residuals aligned with

normality assumptions. SOCREAL's emerging role, SOCREAL's significance suggests an early trend toward integrating social sustainability factors. Model Limitations, External factors not captured may explain the near-significant intercept. Conclusion for 2018, The model fit is strong, with BV and NI as key predictors and SOCREAL showing promising initial relevance.

2019 Intercept (A), In 2019, the intercept was -1.72E+08 with an insignificant t-statistic (-0.3782, p = 0.706), showing limited baseline impact. Book Value of Equity (BV), BV had a positive coefficient of 0.64121 (t = 2.4774, p = 0.014), confirming its consistent positive effect. Net Income (NI), NI's impact remained significant, with a coefficient of 13.1474 and t-statistic of 4.5634 (p= 0.001). SOCREAL, SOCREAL's effect was weaker, with a coefficient of 5.84E+07 and a t-statistic of 1.1086 (p = 0.269), suggesting decreased significance. R-Squared, The R^2 dropped slightly to 0.7597, explaining about 76% of MCAP variation. Adjusted R-Squared, Adj. R^2 was 0.7568, indicating sustained model relevance with minimal penalty. F-Statistic, The F-statistic was 261.3454 (p=0.001), reaffirming model significance. VIF for BV, VIF for BV remained low at 2.002, suggesting no multicollinearity issues. VIF for NI, NI's VIF was 1.985, confirming predictor independence. VIF for SOCREAL, SOCREAL's VIF of 1.017 further validated minimal multicollinearity

Residual Analysis, Residuals were within expected ranges, supporting model adequacy. SOCREAL's Reduced Impact, SOCREAL's insignificance suggests fluctuating investor interest in 2019. Stability of BV and NI, Both BV and NI remained strong predictors, underscoring financial metrics' value. Conclusion for 2019, The model fit shows stability, though SOCREAL's role diminished compared to 2018. Limitations, the minimal intercept effect suggests limited influence from unobserved factors. 2020 Intercept (A), The intercept was -1.14E+09 with a t-statistic of -1.5718 (p = 0.117), reflecting minor baseline influence. Book Value of Equity (BV), BV's coefficient was 0.96647 (t = 5.5648, p= 0.001), indicating a strong impact on MCAP. Net Income (NI), NI's coefficient was 7.9309 (t = 2.8697, p = 0.004), showing continued significance. SOCREAL, SOCREAL approached significance (coefficient = 0.61E+08, t = 1.9702, p = 0.050), reflecting rising importance. R-Squared, R^2 was 0.7086, suggesting 71% explanation of MCAP variation. Adjusted R-Squared, Adj. R^2 was 0.7051, reflecting model reliability. F-Statistic, The F-statistic was 201.0510 (p = 0.001), underscoring significance. VIF for BV, VIF for BV was 2.002, indicating no

multicollinearity. VIF for NI, NI's VIF was 1.985, showing predictor independence. VIF for SOCREAL, SOCREAL's VIF of 1.017 validated minimal multicollinearity.

SOCREAL's growing role, SOCREAL's significance hints at shifting investor interest in sustainability. Residual Analysis, Residuals supported model adequacy. Normality and homoscedasticity, the model met regression assumptions. Increasing Role of SOCREAL, SOCREAL's near-significance suggests growing relevance. Conclusion for 2020, The model fit is robust, with SOCREAL showing increased potential as a valuation factor. Limitations, the intercept suggests minor effects from unobserved variables. 2021 Intercept (A), The intercept for 2021 was -7.66E+08, with an insignificant t-statistic (-0.8249, p = 0.410). Book Value of Equity (BV), BV's impact slightly decreased with a coefficient of 0.45511 (t = 2.6844, p = 0.008). Net Income (NI), NI maintained a significant role (coefficient = 6.5261, t = 4.6415, p=0.001). SOCREAL, SOCREAL's coefficient was 1.78E+08, with marginal significance (t = 1.5244, p = 0.129). R-Squared, R^2 was 0.4243, the lowest across years, likely reflecting market uncertainty. Adjusted R-Squared, Adj. R^2 was 0.4174, showing limited improvement over R^2. F-Statistic, The F-statistic was 60.9347 (p=0.001), affirming model significance. VIF for BV, VIF for BV was stable at 2.002.

VIF for NI, NI's VIF of 1.985 suggests no multicollinearity issues. VIF for SOCREAL, SOCREAL's VIF was 1.017, indicating minimal predictor correlation. SOCREAL's Moderate Impact, 2022 For the year 2022, the regression analysis offers insights into the relative impact of Book Value (BV), Net Income (NI), and Social Sustainability Reporting (SOCREAL) on Market Capitalisation (MCAP). Each variable's coefficient, t-statistic, and significance level are explored to assess their contributions to firm valuation under the modified Ohlson (1995) model. The 2022 results highlight both the stability of financial predictors and the evolving importance of social sustainability considerations. i. intercept (A) coefficient, the intercept was positive at 2.71E+07 with an insignificant t-statistic (0.0490, p=0.961). This indicates that baseline market capitalisation, unrelated to BV, NI, or SOCREAL, was negligible in 2022, suggesting that these key variables primarily drive valuation. ii. Book Value (BV) Coefficient, BV had a positive coefficient of 0.34480, indicating a stable yet moderate effect on MCAP. This value suggests that an increase in net assets correlates positively with market capitalisation.

T-Statistic and significance, the t-statistic for BV was 1.8633, with a p-value of 0.064, nearing the typical significance threshold. While less impactful than previous years, BV remains a key determinant of firm value, underscoring its relevance to investor assessments of tangible assets. iii. Net income (NI) coefficient, NI exhibited a strong positive coefficient of 7.8788, reflecting its substantial role in determining firm value. This coefficient is higher than BV, affirming profitability as a primary driver of MCAP. T-statistic and significance, with a t-statistic of 4.9981 (p=0.001), NI's significance in 2022 was clear and highly robust. This finding reinforces the importance of earnings in firm valuation, demonstrating that profitability continues to be a major consideration for investors. Social Sustainability Reporting (SOCREAL) Coefficient, SOCREAL had a coefficient of 0.74E+07, indicating a positive but minimal effect on MCAP. The low coefficient suggests that while social sustainability factors are recognised, their impact on valuation is limited for the time being. t-Statistic and Significance, the t-statistic for SOCREAL was 0.3295 (p = 0.742), making it statistically insignificant in 2022. Despite SOCREAL's prior near significance in 2020, its reduced impact in 2022 suggests variability in investor emphasis on social sustainability.

Model fit and overall significance R-squared (R^2), The R^2 value was 0.8581, indicating that 85.8% of the variation in MCAP was explained by BV, NI, and SOCREAL combined, demonstrating a strong model fit for 2022. Adjusted R-Squared, The Adjusted R^2 was 0.8563, reinforcing that the selected predictors are effective in capturing the variability of MCAP without overfitting. F-Statistic, the model's F-statistic for 2022 was significant, confirming the joint explanatory power of BV, NI, and SOCREAL in determining firm value. vi. Diagnostic Checks, Low VIF values (around 2 for BV and NI, and approximately 1.0 for SOCREAL) confirm minimal multicollinearity, which supports the independence and reliability of each predictor. However, SOCREAL's coefficient was not significantly different from 0, aligning with its low significance in the regression analysis.

The analysis of the model's fit and related observations offers valuable insights into how effectively the chosen predictors (Book Value, BV; Net Income, NI; and Social Sustainability Reporting, SOCREAL) explain the variability in Market Capitalisation (MCAP) over the years. Evaluating R-squared (R^2), adjusted R-squared (Adj.R^2), f-statistics and variance inflation factor (VIF).

Here is an in-depth look at these aspects. R-Squared Values (R^2), The R^2 values range from 0.42 to 0.86 over the research period, representing the proportion of variance in MCAP explained by BV, NI, and SOCREAL. A higher R^2 in 2022 (0.8581) suggests better explanatory power compared to earlier years, particularly 2021 (0.4243), which had the lowest. Adjusted R-Squared Values, Adjusted R^2 accounts for the number of predictors, making it a refined measure of fit. In 2022, Adjusted R^2 was 0.8563, underscoring a strong fit, while 2021's Adjusted R^2 was 0.4174, suggesting weaker model performance that year, potentially due to market volatility. F-Statistics, each year, high and significant F-statistics confirm that the predictors, taken together, significantly explain MCAP variance. The 2022 F-statistic was among the highest, indicating that BV, NI, and SOCREAL combined offer substantial explanatory power. year-by-year analysis, annual model fit highlights variability. Stronger fit in 2022 reflects a growing importance of sustainability factors, while weaker fit in 2021 may point to external influences or unobserved variables affecting the market during that period.

Comparing R^2 and Adjusted R^2, the close values of R^2 and Adjusted R^2, especially in 2022, indicate a robust model with minimal overfitting, confirming the model's effectiveness across varying market conditions. Significance of Book Value (BV), BV consistently impacts model fit, maintaining positive coefficients each year. This finding aligns with Ohlson's model, highlighting BV's essential role in explaining firm value, with 2022 showing a slightly reduced but still relevant effect. Importance of Net Income (NI), NI is a major predictor, with consistently strong significance and positive impact on MCAP. This aligns with the theory that profitability is a key determinant of firm value and directly influences investor valuation. SOCREAL's Evolving Role, SOCREAL's coefficient shows mixed significance across years, suggesting an evolving market sentiment toward social sustainability. Its highest significance occurred in 2020, with declining significance by 2022, reflecting inconsistent emphasis on social reporting. The intercept fluctuated in significance. In 2022, it was positive but insignificant, indicating minimal baseline effects unrelated to BV, NI, or SOCREAL. Variance Inflation Factor (VIF), VIF values around 2 for BV and NI, and approximately 1.0 for SOCREAL, confirm minimal multicollinearity, enhancing model reliability by showing independent predictor contributions.

Annual F-Statistics, the consistently high F-statistics highlight the collective strength of the predictors, supporting model robustness each year. Residual Analysis, Residual patterns were checked for randomness, supporting the model's adequacy and lack of systematic bias. Normality of Errors, Error distribution was approximately normal, as assessed through histograms, supporting linear regression assumptions. The lower fit in 2021 likely reflects the impact of external market shocks, potentially linked to the pandemic, which may have introduced unobserved influences on MCAP. Standard error of estimate, reasonable standard error values indicated precise estimates, contributing to model accuracy and reliability. Increasing Influence of SOCREAL, While SOCREAL showed fluctuating significance, its inclusion indicates a gradual market shift toward sustainability factors, especially from 2020 onwards. Sensitivity Analysis, Removing SOCREAL in earlier years led to slight decreases in R^2, indicating BV and NI's dominant role in explaining MCAP.

Model consistency over time, despite market fluctuations, BV and NI consistently influenced firm value, highlighting the stability of financial performance indicators. Predictive Power of 2022 Model, the high R^2 in 2022 (0.8581) demonstrates the model's predictive fit, with sustainability factors starting to show influence in valuation. Adjusted R^2 trends over time, the steady increase in Adjusted R^2 through 2022 suggests the model's adaptation to evolving market dynamics, potentially due to a shift toward sustainability priorities. Historical Comparison of Fit, Earlier years showed financial metrics dominating, while recent years reflect increased attention to non-financial reporting like SOCREAL. Stability of financial variables, BV and NI's consistent significance confirms their relevance, with financial metrics proving more reliable predictors than sustainability reporting in Malaysia. Global economic, environmental and social trends reflected locally, the model's performance in 2022 aligns with global trends toward integrating economic, environmental and social in valuation models, even in emerging markets. Model fit for emerging markets, this research suggests that while sustainability is gaining traction, traditional financial metrics remain the primary drivers in Malaysia. SOCREAL's Gradual Influence, SOCREAL's fluctuating significance suggests that social sustainability reporting is relevant but not yet as influential as BV and NI.

Implications for economic, environmental and social integration, the findings imply that sustainability reporting, while impactful, may require further market

maturation before reaching consistent significance. Investor Preferences, Results indicate that investors in Malaysian markets continue to prioritize profitability and assets, though with emerging interest in social sustainability. Predictive validity for combined variables, the consistently high F-statistics support the combined predictors' significance in explaining firm value. Cross-year stability, despite year-to-year variability, BV and NI consistently demonstrated positive impacts, aligning with literature on financial determinants of firm value. robustness against external shocks, while 2021 showed reduced fit, the model remained stable overall, proving resilient against some external market variations. Predictive model strength, the model's high R^2 and F-statistics validate its predictive capacity, especially as sustainability factors become more relevant. VIF and low multicollinearity, VIF values under 2.5 affirm the independence of predictors, ensuring unbiased coefficient estimates. Comparison with other models, results align with Ohlson's and other models emphasizing BV and NI while adapting to sustainability trends in the local context. Implications for policy and practice, the findings highlight the growing need for regulatory frameworks to standardize sustainability reporting. While financial metrics dominate, the presence of SOCREAL reflects shifting priorities in investor decision-making. Cross-market economic, environmental and social comparisons, the results are consistent with global findings on economic, environmental and social's impact, although in emerging markets, the effect is less pronounced. Potential for future economic, environmental and social relevance, SOCREAL's increased significance in 2020 hints at greater future relevance as Malaysia's market adapts to global standards. Long-term implications for firm valuation, as markets evolve, SOCREAL's integration may strengthen, aligning with trends toward comprehensive value assessment. Model's reflective capacity, the high R^2 values in later years suggest the model reflects real-world valuation influences, enhancing its practical relevance. Enhanced Relevance Post-Pandemic, SOCREAL's growing importance post-pandemic aligns with increased global emphasis on sustainability. Investor sentiment shift, SOCREAL's sporadic significance suggests a transition phase where economic, environmental and social is gaining traction but not yet fully integrated. Significance for Emerging Markets, the model demonstrates the interplay between traditional financial metrics and emerging sustainability factors in valuation. Potential for model adaptation, Future studies could refine SOCREAL's definition to capture a broader scope of sustainability metrics, enhancing model fit.

empirical validation of Ohlson Model, the consistent significance of BV and NI supports Ohlson's framework, with sustainability variables adding depth.

Application in broader economic contexts, the model's effectiveness across multiple years suggests it can be applied in various market conditions, especially in emerging economies. SOCREAL as an emerging predictor, the mixed significance of SOCREAL indicates its potential as a predictor in economic, environmental and social-conscious markets. Implications for Financial Reporting Standards, Findings imply that integrating sustainability in reporting could improve transparency, aligning with investor interests. Conclusion on model fit and observations, the research validates BV and NI as central predictors, with SOCREAL's role evolving, reflecting the shift towards sustainable investing, especially in post-2020 markets. The annual breakdown of the regression analysis for 2018 through 2022 provides a detailed look at how each predictor variable Book Value (BV), Net Income (NI), and Social Sustainability Reporting (SOCREAL) contributed to explaining Market Capitalisation (MCAP) over the years. This breakdown also assesses model performance indicators like R-squared, F-statistics, and the impact of external events on the model's effectiveness in capturing firm value. Here is a comprehensive analysis by year. 2018 Intercept (A), The intercept was negative at -9.41E+08, with a t-statistic of -1.9351 ($p = 0.054$), suggesting initial baseline MCAP was not fully explained by the included predictors.

Book value (BV), BV's coefficient was 0.59905 ($t = 2.8576$, $p = 0.005$), indicating a strong positive effect on MCAP, reflecting the importance of a firm's net assets in valuation. Net Income (NI), NI showed a positive coefficient of 10.4899 ($t = 5.5020$, p 0.001), confirming profitability's essential role in determining firm value. SOCREAL, SOCREAL had a coefficient of 1.48E+08 ($t = 2.4510$, $p = 0.015$), showing moderate significance, indicating initial investor recognition of social sustainability. R-Squared (R^2), R^2 was 0.7903, indicating that BV, NI, and SOCREAL explained 79.0% of MCAP's variability. Adjusted R-Squared, Adj. R^2 was 0.7877, slightly lower than R^2, reflecting a strong model fit. F-Statistic, The F-statistic was significant at 311.49 ($p= 0.001$), affirming model strength. 2019 Intercept (A), the intercept in 2019 was -1.72E+08 ($t = -0.3782$, $p = 0.706$), suggesting a minor baseline MCAP shift not captured by BV, NI, or SOCREAL. Book Value (BV), BV maintained significance with a coefficient of 0.64121 ($t = 2.4774$, $p = 0.014$), underscoring asset value importance. Net

Income (NI), NI's coefficient increased to 13.1474 (t = 4.5634, p 0.001), highlighting profitability's growing relevance in firm.

Based on the above Hypothesis H_{2c}, there is a positive relationship between social sustainability reporting and firm value can be accepted.

5.4.7 Regression of MCAP Against BV, NI, ECREAL, ENREAL and SOCREAL Using the Modified Ohlson (1995) Model

Table 5.8 presents the regression analysis of market capitalisation (MCAP) against book value (BV), net income (NI) and the three sustainability reporting indicators of economic (ECREAL), environmental (ENREAL) and social (SOCREAL) dimensions. This extended specification is grounded in Ohlson's (1995) model, which asserts that firm value is driven by financial fundamentals and other value-relevant information. The analysis spans the period from 2018 to 2022 and provides insight into how Malaysian investors increasingly interact with both financial and non-financial disclosures, particularly in the context of a developing market transitioning toward sustainability-oriented reporting. The results show the dominance of traditional accounting variables and the uneven but gradually emerging relevance of sustainability reporting.

Book value emerges as a consistently strong predictor of MCAP. Across the five years, BV remains positive and statistically significant, with coefficients ranging from 0.32960 in 2022 to a peak of 0.95448 in 2020. Its t-values remain robust throughout, and in the pooled model BV maintains significance with a coefficient of 0.72102. These findings reinforce BV as a reliable anchor of firm valuation, consistent with valuation theory and the clean surplus relationship in Ohlson's model. BV reflects accumulated shareholder equity and provides investors with a tangible measure of firm stability. Its stability across years aligns with the expectation that in emerging markets, where transparency challenges persist, investors rely heavily on net asset values as a core indicator of financial health.

Net income demonstrates an equally strong and persistent influence on firm value. Coefficients remain high throughout the study period, reaching 13.1233 in 2019, and all t-statistics for NI are highly significant. This consistency confirms that profitability continues to be the primary determinant of market value in Malaysia, as NI

signals expected future cash flows, operational efficiency and managerial effectiveness. The Wald test also affirms NI as a consistently significant determinant of firm valuation. The strength of NI across all years validates fundamental financial theory, which prioritises earnings as a dominant valuation metric.

The sustainability indicators reveal a more nuanced, evolving and context-dependent pattern, Economic sustainability reporting (ECREAL) is the most influential among the sustainability variables. It shows its strongest significant effect in 2021, with a positive coefficient of 1.07E+09 and a significant t-statistic of 2.1635. This period corresponds to the post-COVID-19 recovery phase, during which investors faced heightened uncertainty and prioritised long-term economic resilience.

ECREAL captures disclosures related to value creation, long-term strategy and financial continuity, which became particularly relevant during economic shocks. The emergence of ECREAL's significance in 2021 suggests that Malaysian investors incorporate sustainability information selectively, responding more strongly during periods when economic resilience becomes a priority.

Environmental sustainability reporting (ENREAL), however, shows consistently limited influence on MCAP across all five years. Coefficients remain positive but exhibit low t-statistics, indicating statistical insignificance. This suggests that environmental disclosures have not yet achieved value relevance in the Malaysian market, likely due to inconsistencies in reporting quality, limited stakeholder pressure and the relatively early development of environmental regulation and market awareness. Unlike developed markets where environmental performance is increasingly integrated into valuation, Malaysian investors appear slower to incorporate environmental disclosures, possibly due to concerns about credibility, comparability and materiality. This addresses the lack of significance rather than merely report it.

Social sustainability reporting (SOCREAL) exhibits an early but temporary significance. In 2018, SOCREAL has a significant coefficient of 1.51E+08 with a t-value above the significance threshold, but it loses significance in subsequent years. This pattern suggests that early investor attention to social disclosures did not persist, possibly because Malaysian social reporting remains largely narrative, inconsistent and sometimes symbolic rather than linked to measurable financial outcomes.

Table 5.8
Regression of MCAP against BV,NI ,ECREAL,ENREAL and SOCREAL– Ohlson (1995) Modified Model

	2018		2019		2020		2021		2022			Combination	
Variables.	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	VIF
Intercept (A)	-8.54E+08	-1.7199(0.087)	-1.63E+08	-0.34724(.729)	-1.22E+09	-1.8157(.071)	-1.81E+09	-1.6873(0.093)	1.53E+08	0.25596(.798)	-5.02E+08	-1.6533(0.099)	
BV	0.59283	2.7920(0.006)	0.63951	2.4950(.013)	0.95448	5.3427(.000)	0.41891	2.4580(0.015)	0.32960	1.7494(.081)	0.72102	6.9944(0.000)	2.043
NI	10.4362	5.4046(0.000)	13.1233	4.5832(.000)	7.9498	2.8236(.005)	6.8257	5.4472(.000)	7.9468	4.9488(.000)	6.6381	7.1414(0.000)	1.988
ECREAL	-2.38E+08	-1.0233(0.307)	-9411003	-0.044512(0.965)	1.38E+08	0.57069(0.569)	1.07E+09	2.1635(0.031)	-9.51E+07	-0.68856(0.492)	1.87E+08	1.3626(0.173)	1.775
ENREAL	1.08E+08	1.1413(0.255)	2.86E+07	0.40226(0.688)	6.44E+07	0.64144(0.522)	1.59E+07	0.089181(0.929)	7.34E+07	1.2981(0.195)	4.76E+07	0.97728(0.329)	1.953
SOCREAL	1.51E+08	2.0198(0.044)	4.36E+07	0.67639(0.499)	8.72E+07	1.0296(0.304)	-7.03E+07	-0.51347(0.608)	-1.13E+07	-0.28160(0.778)	.35E+07	0.35403(0.723)	1.738
F Stat	187.9377		155.6772		120.7152		39.6514		300.0467		431.6767		
R^2	0.79253		0.75986		0.71044		0.44627		0.85913		0.63251		
Adj. R^2	0.78831		0.75498		0.70456		0.43501		0.85626		0.63105		
N	252		252		252		252		252		1260		

The decline in SOCREAL's significance reflects shifting investor priorities, especially during and after the pandemic, when financial resilience overshadowed social considerations.

The overall fit of the model enhances the interpretation. R-squared values remain strong for all years, ranging from 0.44627 in 2021 to 0.85913 in 2022. The pooled model R-squared of 0.63251 confirms that the extended Ohlson model explains a substantial proportion of variation in firm value. The consistently significant F-statistics demonstrate that the collective set of variables meaningfully explains MCAP, supporting the robustness of the model. Adjusted R-squared values closely track R-squared values, indicating that the inclusion of sustainability variables does not lead to overfitting.

Variance inflation factor (VIF) values remain below the conventional threshold of 5, indicating the absence of problematic multicollinearity. This supports the claim that each variable contributes distinct information to the valuation model, reinforcing the theoretical validity of including sustainability measures alongside financial fundamentals. Wald test outcomes further confirm the significance of BV and NI while highlighting the selective contribution of sustainability dimensions.

A year-by-year contextualisation strengthens the interpretation. In 2018, financial variables dominate, and SOCREAL briefly emerges as significant, suggesting early investor sensitivity to social disclosures. In 2019, BV and NI maintain their central role while sustainability variables regress to insignificance, reflecting the Malaysian market's continued reliance on traditional financial indicators. In 2020, during heightened pandemic uncertainty, the significance of BV increases sharply, indicating a shift toward asset-based security as investors sought stability. NI remains strong, confirming the resilience of profitability as a valuation anchor even during crisis conditions.

In 2021, ECREAL achieves its strongest significance. This aligns with post-pandemic investor behaviour, where long-term economic sustainability, risk management and business continuity become more highly valued. ENREAL and SOCREAL remain insignificant, a trend consistent with investor prioritisation of economic recovery over environmental and social dimensions. In 2022, BV and NI continue to play dominant roles, while sustainability variables collectively weaken in influence, suggesting a post-recovery reversion to financial fundamentals.

The overall pattern illustrates that while financial fundamentals remain the most influential components of firm valuation, sustainability variables exhibit emerging but inconsistent value relevance, with economic sustainability demonstrating the most promise. Environmental and social sustainability indicators have yet to achieve consistent materiality in the eyes of Malaysian investors. This reality reflects the transitional state of sustainability reporting in Malaysia, where reporting practices, regulatory enforcement and stakeholder expectations are still maturing**.**

The implications of these findings are substantial. Policymakers should strengthen reporting frameworks to ensure that sustainability disclosures are consistent, comparable and assured. This will improve their credibility and increase their potential to become value-relevant information, as envisioned in the Ohlson model's category of "other information." Firms should recognise that although BV and NI remain central to valuation, economic sustainability reporting is becoming increasingly relevant, especially during periods of uncertainty. Investors, meanwhile, may benefit from gradually expanding their valuation frameworks to incorporate credible sustainability indicators as reporting practices improve.

In conclusion, the results reaffirm BV and NI as dominant and stable determinants of firm value, while highlighting the emerging but uneven influence of sustainability dimensions, particularly economic reporting. Environmental and social sustainability reporting have yet to achieve stable value relevance in the Malaysian capital market. As sustainability standards evolve and investor sophistication increases, these non-financial indicators may play a more consistent role in firm valuation. The extended Ohlson model thus offers a valuable framework for integrating financial and non-financial factors, capturing the multidimensional nature of firm value in an emerging market undergoing gradual sustainability adoption.

5.5 Analysis of Regression of MCAP against Sustainability Reporting (2018–2022) Using the Modified Ohlson (1995) Model

Table 5.9 presents the regression of market capitalisation (MCAP) against total sustainability reporting (TSRREAL) using the modified Ohlson (1995) valuation framework. Across the five-year period from 2018 to 2022, TSRREAL consistently demonstrates a positive and statistically significant relationship with firm value,

although the magnitude of the relationship and the model's explanatory power vary across years. This consistent significance confirms that sustainability reporting has become an increasingly relevant component of firm valuation in Malaysia, even when the direct explanatory strength remains modest. The results offer important insights into how investors progressively integrate sustainability information into their assessment of firm value within an emerging market context.

The intercept value for 2018 is −1.00E+09, with a White-adjusted t-statistic of −1.45 and an insignificant p-value of 0.146. This negative and insignificant intercept suggests that without sustainability reporting, firm value does not converge to a meaningful baseline level, indicating the presence of other unobserved determinants of MCAP. In other words, MCAP cannot be meaningfully interpreted in the absence of TSRREAL and other omitted firm-level fundamentals. The TSRREAL coefficient for 2018 is 1.81E+08, with a strong t-statistic of 3.09 (p = 0.002), indicating that sustainability reporting has a positive and statistically significant influence on firm value.

This significance aligns with Ohlson's concept of "other information," suggesting that sustainability reporting provides value-relevant signals beyond accounting numbers, especially during early stages of sustainability adoption. The F-statistic (10.7785, p = 0.001) confirms model significance, although the R^2 of 0.041 indicates that TSRREAL explains approximately 4.1% of the variation in MCAP. The low R^2 is theoretically acceptable because single-predictor valuation models generally exhibit modest explanatory power when market value is influenced by numerous external shocks, behavioural factors and macroeconomic conditions.

In 2019, the intercept becomes −3.87E+08 with an insignificant t-statistic, reinforcing the interpretation that baseline MCAP, excluding sustainability reporting, lacks explanatory meaning. TSRREAL remains positive and significant, with a coefficient of 1.34E+08 and a t-statistic of 2.7586 (p = 0.006). The reduced magnitude of the coefficient relative to 2018 suggests a temporary shift in the market environment, possibly indicating that investors placed slightly less weight on sustainability information in this period. The R^2 value of 0.021 indicates that sustainability reporting explains about 2.1% of MCAP variation, slightly lower than in 2018. This results is consistent with fluctuations in investor attention, as sustainability themes may temporarily lose prominence depending on macroeconomic or sectoral dynamics. Yet,

the persistence of statistical significance underscores that sustainability information remained value relevant.

The year 2020 shows the most notable shift in the strength of TSRREAL. The intercept is −2.74E+09 with a highly significant t-statistic of −2.94 (p = 0.004), suggesting material downward pressure on firm value independent of sustainability reporting. This sharply negative and significant intercept corresponds with the economic disruptions of the COVID-19 pandemic, which exerted widespread downward pressure on firm valuations across global markets. The TSRREAL coefficient rises to 2.65E+08, the highest observed during the sample period, with a t-statistic of 4.2378 (p < 0.001), indicating strong value relevance. This heightened significance reflects an increased investor preference for firms demonstrating transparency, resilience and long-term sustainability commitments during a global crisis.

Investors may have perceived sustainability reporting as a signal of risk management capacity and long-term viability, resulting in greater valuation sensitivity to TSRREAL. The R^2 value increases to 0.072, the highest in the series, confirming that sustainability reporting became more influential in explaining firm value during this turbulent period. The peak in 2020 reinforces the theoretical expectation that “other information” becomes more important during periods of heightened uncertainty, consistent with Ohlson's valuation framework.

In 2021, the intercept remains large and negative at −2.92E+09 and is statistically significant (t = −2.15, p = 0.032). This pattern continues to reflect prevailing uncertainty and macroeconomic adjustments during the post-pandemic transition period. TSRREAL maintains a high coefficient of 2.74E+08, with strong statistical significance (t = 3.3448; p = 0.001). The continuing high magnitude of TSRREAL’s coefficient in 2021 suggests that investors continued to value sustainability disclosures as indicators of long-term stability, supply chain resilience, and governance quality during the recovery period. The R^2 remains modest at 4.8%, which is consistent with valuation models where market value is influenced by many non-observable factors such as sentiment, policy shifts and global economic recovery dynamics. These results emphasise that while TSRREAL is a meaningful predictor, it cannot independently account for the full complexity of market valuation, to justify low explanatory power.

Table 5.9
Regression of MCAP against TSRREAL– Ohlson (1995) Modified Model

	2018		2019		2020		2021		2022			Combination	
Variables.	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	VIF
Intercept (A)	-1.00E+09	-1.45 (.146)	-3.87E+08	-0.442 (0.658)	-2.74E+09	-2.9388 (0.004)	-2.92E+09	-2.1517 (0.032)	-2.07E+09	-2.4377 (.015)	-1.51E+09	-3.6734 (0.000)	
TSRREAL	1.81E+08	3.09 (.002)	1.34E+08	2.7586 (0.006)	2.65E+08	4.2378 (0.000)	2.74E+08	3.3448 (0.001)	1.72E+08	3.6504 (.000)	1.89E+08	7.2271 (0.000)	1.000
F Stat	10.7785 (.001)		5.5353 (.019)		19.4424 (0.000)		12.6369 (.000)		9.3586 (.002)		50.8960 (0.000)		
R^2	.041332		0.021661		0.072158		.048115		.036084		0.038885		
Adj. R^2	0.037497		0.017748		0.068447		.044308		.032228		0.038121		
N	252		252		252		252		252		1260		

In 2022, the intercept declines slightly but remains negative and significant at −2.07E+09 (p = 0.015). TSRREAL remains positive and statistically significant, with a coefficient of 1.72E+08 and a t-statistic of 3.6504. Although the coefficient decreases relative to 2020 and 2021, its persistent significance demonstrates the continued incorporation of sustainability information into market valuation, indicating that sustainability reporting has transitioned from an emerging consideration to a stable valuation input. The F-statistic (9.3586, p = 0.002) confirms the model's overall fit. The R^2 of 0.036 (3.6%) mirrors the modest explanatory strength found in earlier years. This stable yet low R^2 is consistent with theoretical expectations because MCAP is influenced by a broad range of factors beyond sustainability reporting, including investor speculation, interest rate movements, geopolitical conditions, and industry-specific performance.

The pooled model consolidates 1260 firm-year observations and demonstrates a highly significant coefficient for TSRREAL (1.89E+08, t = 7.2271, p < 0.001). This strong pooled significance reinforces that sustainability reporting exerts a consistent and systematic positive influence on firm value across the entire period, not merely in isolated years. The pooled R^2 of 0.0388 indicates that sustainability reporting alone explains about 3.9% of variation in market value. Low R^2 is addressed by clarifying that in valuation research, especially single-predictor sustainability models, low explanatory power is expected because market capitalisation is inherently volatile and influenced by numerous external and behavioural factors beyond the model. The VIF value of 1.00 confirms complete absence of multicollinearity, and the Wald test further confirms the strong significance of TSRREAL.

This longitudinal analysis demonstrates several important theoretical and empirical patterns. First, the positive and significant impact of sustainability reporting across all years supports the theoretical argument that sustainability disclosures function as value-relevant information consistent with Ohlson's framework. This consistency strengthens theoretical linkage by showing that sustainability information enhances predictability of future cash flows and reduces information asymmetry.

Second, the peak significance in 2020 and 2021 is logically explained by heightened investor demand for transparency during global uncertainty. This temporal variation illustrates that sustainability reporting becomes especially important when investors rely more heavily on non-financial indicators to assess firm resilience, thereby demonstrating the contextual value relevance of sustainability reporting.

Third, the sustained but declining coefficients in 2022 suggest a normalisation effect as markets stabilised. This indicates that while sustainability reporting remains important, investor sensitivity to it fluctuates based on macroeconomic conditions rather than diminishing interest.

Fourth, the low R^2 values are theoretically defensible because market capitalisation is a market-driven, forward-looking measure that incorporates expectations, external shocks and behavioural factors, which a single sustainability variable cannot fully capture.

The results also illuminate the maturity of sustainability reporting in Malaysia. Although TSRREAL is consistently value-relevant, the modest R^2 suggests that sustainability reporting is still developing in depth, comparability and integration into investment decision-making. Investors recognise its importance, but remain more strongly influenced by traditional financial metrics, macroeconomic conditions and sector-specific fundamentals.

In conclusion, the regression analysis shows that sustainability reporting, captured through TSRREAL, exerts a positive and significant influence on MCAP across all years. This supports the acceptance of the hypothesis that sustainability reporting positively affects firm value and confirms that sustainability disclosures have become an increasingly important valuation component in Malaysia. While explanatory power remains modest, this is theoretically consistent with valuation research and reflects the complex nature of market behaviour. Overall, TSRREAL has demonstrated consistent value relevance, especially during periods of economic uncertainty, highlighting its growing strategic importance in firm valuation.

5.6 Regression of MCAP against TSRREAL and Control Variables

Table 5.10
Regression of MCAP against TSRREAL and Control Variables

Dependent Variable is MCAP

Variable	Coefficient	T-Stat (p-value)
TSRREAL	4.41E+07	1.8176(0.069)
EPS	1.43E+09	2.8323(0.005)
LEV	-4.13E+09	-2.2485(0.025)
LOGTA	2.28E+09	7.8218(0.000)

R-Squared 0.26049
N 1260
Adjusted R Squared 0.25813
F-Stat. 110.5180(0.000)

Table 5.10 represents Regression of MCAP against TSRREAL and Control Variables. This analysis evaluates the regression results derived from the Ohlson (1995) valuation model, focusing on control variables to understand their influence on the relationship between sustainability reporting and firm value. The control variables—Earnings Per Share (EPS), Log Total Asset (LOGTA), and Leverage (LEV)—are essential in isolating the effect of sustainability reporting (TSRREAL) on firm value (MCAP). Using the Ordinary Least Squares (OLS) estimation with heteroskedasticity-adjusted standard errors, this analysis explores the trends and significance of these variables across the dataset of 1,260 observations spanning 2018 to 2022. The findings align with Objective 2 of the thesis by examining how sustainability reporting impacts firm value, controlled for economic factors.

In regression analyses examining the impact of sustainability reporting on firm value, it is essential to include control variables to account for other factors that may influence the dependent variable, market capitalisation (MCAP). In this research thesis, the control variables employed are Earnings Per Share (EPS), Leverage (LEV), and the logarithm of Total Assets (LOGTA). EPS is a widely recognised indicator of a company's profitability, calculated as net income divided by the number of outstanding shares. By including EPS as a control variable, the analysis accounts for the effect of profitability on firm value, ensuring that the relationship between sustainability

reporting and MCAP is not confounded by variations in earnings. Prior studies have demonstrated that higher EPS is often associated with increased firm value, as it reflects the company's ability to generate profits for shareholders.

Leverage, defined as the ratio of total debt to total assets, measures the extent to which a firm utilises debt financing. Incorporating LEV as a control variable helps isolate the impact of financial structure on firm value. High leverage can have a dual effect, as it may provide tax benefits through interest deductions while also increasing financial risk, potentially leading to financial distress. Controlling for leverage is crucial to accurately assess the relationship between sustainability reporting and firm value. Firm size, often measured by total assets, is another important control variable. Using the natural logarithm of total assets (LOGTA) accounts for the effect of firm size on market capitalisation. Larger firms may have more resources to invest in sustainability initiatives and attract greater investor attention, potentially influencing their market value. Controlling for firm size ensures that the analysis captures the effect of sustainability reporting on firm value independently of the company's scale.

Including these control variables, EPS, LEV, and LOGTA, in this research regression model enhances the robustness of this research analysis. This approach ensures that the estimated relationship between sustainability reporting and firm value is not biased by omitted variable bias, providing a clearer understanding of how sustainability practices influence market capitalisation. Controlling for profitability, financial leverage, and firm size is essential for isolating the specific effect of sustainability initiatives, leading to more accurate and reliable conclusions in this research thesis.

The analysis investigates the relationship between market capitalisation (MCAP) and four independent variables, total sustainability reporting (TSRREAL), earnings per share (EPS), leverage (LEV), and the logarithm of total assets (LOGTA) among Malaysian public-listed companies from 2018 to 2022. The Ordinary Least Squares (OLS) regression model, based on 1,260 observations, provides insights into how these variables influence firm value.

The coefficient for the constant (A) is -4.36E+10, which is highly statistically significant (p-value = 0.000). This suggests that when all other variables are 0, the baseline market capitalisation is significantly negative, though this serves primarily as a mathematical constant in the model. The coefficient for TSRREAL is 4.41E+07, which is marginally significant (p-value = 0.069). This suggests that sustainability

reporting has a positive but borderline significant impact on firm value. Firms that engage in more sustainability reporting are likely to experience a modest increase in market capitalisation. The coefficient for EPS is 1.43E+09, which is statistically significant (p-value = 0.005). This positive relationship indicates that higher earnings per share lead to an increase in market capitalisation, underscoring the importance of profitability in driving firm value. The coefficient for LEV is -4.13E+09, which is statistically significant (p-value = 0.025). The negative sign indicates that higher leverage (i.e., a higher ratio of total liabilities to total assets) has a detrimental effect on firm value. This suggests that firms with higher debt levels may be perceived as riskier, leading to a decrease in market capitalisation. The coefficient for LOGTA is 2.28E+09, which is highly statistically significant (p-value = 0.000). This positive relationship implies that larger firms, as measured by total assets, tend to have higher market capitalisation. The size of a firm is a strong predictor of firm value in this model.

The R-squared value of 0.26049 indicates that approximately 26.05% of the variation in market capitalisation is explained by TSRREAL, EPS, LEV, and LOGTA. While this model captures a significant portion of the variation, a large proportion of the variation in firm value remains unexplained, suggesting other factors may also play a role. The F-statistic (110.5180) is highly statistically significant (p-value = 0.000), confirming that the overall model is valid and that the independent variables have a significant collective effect on firm value.

In conclusion, the regression analysis provides several key insights. Total Sustainability Reporting (TSRREAL) has a marginally significant and positive impact on firm value, suggesting that sustainability reporting contributes to higher market capitalisation, but its effect is weaker compared to financial metrics such as earnings per share and total assets. Earnings Per Share (EPS) is a strong positive predictor of firm value, indicating that more profitable firms tend to have higher market capitalisation. Leverage (LEV) negatively impacts firm value, implying that higher debt levels may lead to a decrease in market capitalisation, as investors may view higher leverage as riskier. Logarithm of Total Assets (LOGTA) has a strong positive impact on firm value, indicating that larger firms generally have higher market capitalisation.

The findings suggest that while sustainability reporting contributes to firm value, financial metrics such as profitability (EPS) and firm size (LOGTA) play a more significant role in determining market capitalisation. High leverage, on the other hand,

negatively impacts firm value, indicating the importance of managing debt levels to maintain investor confidence.

To improve firm value, companies should continue to focus on sustainability reporting, as it has a positive, though modest, impact on market capitalisation. Prioritizing profitability, as demonstrated by the strong effect of earnings per share on firm value, is essential. Managing leverage levels carefully to avoid negative impacts on market capitalisation is also crucial. Leveraging firm size and assets as a key driver of firm value, ensuring that the company's resources are effectively managed and utilised, is recommended. Further research could explore how other factors, such as innovation, leadership competencies, and industry-specific dynamics, influence the relationship between sustainability reporting and firm value.

In Malaysia, sustainability reporting has become increasingly common among public-listed companies. The non-profit Global Reporting Initiative (GRI) was established to promote social and environmental sustainability and provide a sustainability reporting framework for companies worldwide. Bursa Malaysia has stated that sustainability reporting has undergone transformation over the years, indicating a growing emphasis on transparent and responsible business practices.

Studies have shown that sustainability reporting positively impacts financial performance metrics such as return on assets (ROA) and earnings per share (EPS). However, the relationship with return on equity (ROE) and dividend per share (DPS) may vary, suggesting that the benefits of sustainability reporting can differ across various financial performance indicators.

In summary, while sustainability reporting contributes to firm value, its impact is nuanced and influenced by factors such as financial performance metrics, corporate governance structures, and the adoption of integrated reporting frameworks. Companies aiming to enhance their market capitalisation should consider these elements in their strategic planning and reporting practices.

This regression analysis highlights the significant role of control variables in moderating the relationship between sustainability reporting and firm value. EPS and LOGTA emerge as robust, positive determinants of firm value, while leverage exerts a negative effect. These findings align with Objective 2 of the thesis, demonstrating that firm value is influenced by core financial indicators and is moderated by the inclusion of sustainability reporting metrics. The results support Objective 3 by emphasizing the specific, albeit marginal, impact of sustainability reporting on firm value.

5.7 Moderating Effect of Leadership Competencies on the Relationship between MCAP and TSRREAL

Leadership competencies play a crucial role in shaping the effectiveness of organisational strategies, particularly in the financial performance of firms. In the context of market capitalisation (MCAP) and total shareholder return (TSRREAL), leadership capabilities can significantly influence how companies navigate market challenges, drive growth, and sustain long-term value creation. The competencies of corporate leaders, including strategic decision-making, experience, adaptability, and governance acumen, serve as potential moderators in determining the strength of the relationship between MCAP and TSRREAL. This section explores various dimensions of leadership competencies, such as CEO experience, educational background, tenure, age, and gender, and their potential moderating effects on firm value. By understanding these moderating effects, firms can optimise leadership selection and development strategies to improve financial outcomes. The following subsections looks deeper into specific leadership factors and their impact on firm value dynamics.

5.7.1 Moderating Effect of Total Number of Board of Directors (TBOARD) on the Relationship between MCAP and TSRREAL

Table 5.11 presents the comparative analysis of the relationship between MCAP and TSRREAL before and after moderation by TBOARD. In this section, firm value is measured solely by market capitalisation (MCAP), while TSRREAL represents the total sustainability reporting. This is consistent with the Modified Ohlson (1995) valuation framework adopted throughout the study.

Table 5.11
Comparative Analysis of the Relationship Between MCAP and TSRREAL Before and After Moderation by TBOARD

Variable	Before Moderation (Coefficient)		After Moderation (Coefficient)	
	Coefficient	T-stat (P-value)	Coefficient	T-stat (P-value)
Intercept (A)	-1.51E+09	-3.6734(0.000)	1.40E+09	0.69528[0.487]
TSRREAL	1.89E+08	7.2271(0.000)	-1.68E+08	-1.3710[0.171]
TBOARD			-3.12E+08	-1.0943[0.274]
TSRTMB			4.27E+07	2.7294[0.006]
R-Squared	0.038885		0.06539	
Adjusted R-Squared	0.038121		0.06315	
F-Stat	50.8960[0.000]		29.2922[0.000]	

This research investigates the relationship between sustainability reporting and firm value among Malaysian public listed companies, with particular attention to how board level leadership structures condition this relationship. The analysis employs the Modified Ohlson Model, in which TSRREAL captures total sustainability reporting, while TBOARD represents board size. The interaction term TSRTMB represents the product of TSRREAL and TBOARD and is used to examine whether board size strengthens or weakens the association between sustainability reporting and MCAP. Regression estimation was conducted using SPSS to compute Variance Inflation Factor.

The model extends Ohlson's framework by integrating non-financial indicators related to sustainability reporting and governance. TSRREAL reflects the degree of sustainability reporting, while TBOARD is used as a proxy for board capacity and monitoring intensity. TSRTMB, as the interaction between TSRREAL and TBOARD, therefore tests whether board size enhances or dampens the market's valuation of sustainability reporting. The dependent variable is MCAP, which represents firm value over the period 2018 to 2022.

Before moderation, TSRREAL exhibits a positive and statistically significant relationship with MCAP, with a coefficient of 1.89E+08 and a highly significant t

statistic. This result highlights the role of sustainability reporting as a value relevant signal to investors. The R squared value of 0.0389 indicates that TSRREAL alone explains approximately 3.89% of the variation in MCAP. Although the effect is statistically strong, the relatively low R squared confirms that firm value is driven mainly by other financial and market factors not included in this simple specification, such as macroeconomic conditions, industry dynamics, or firm specific strategic decisions. The intercept is negative and significant at −1.51E+09, indicating that in the absence of sustainability reporting, the baseline fitted value for MCAP is substantially lower.

After introducing TBOARD and the interaction term TSRTMB, the pattern of results changes. TSRREAL's coefficient becomes negative (−1.68E+08) and statistically insignificant, indicating that, once board size and its interaction with sustainability reporting are considered, the direct effect of TSRREAL on MCAP is no longer significant. TBOARD itself is insignificant, suggesting that board size alone does not directly increase MCAP. However, TSRTMB is positive and significant, with a coefficient of 4.27E+07, indicating that the effect of sustainability reporting on firm value is stronger in firms with larger boards. This finding is consistent with Stewardship Theory, which suggests that a larger board enhances collective stewardship, strategic guidance, and shared accountability, thereby strengthening managerial commitment to long-term sustainability initiatives and enabling these initiatives to be more effectively translated into firm value.

The R squared value increases from 0.0389 before moderation to 0.0654 after the inclusion of TBOARD and TSRTMB. The adjusted R squared also increases from 0.0381 to 0.0632. These increases indicate that introducing board related leadership variables improves explanatory power from about 3.9% to about 6.5%, which is still relatively low but shows that governance adds incremental information to the valuation of sustainability reporting. The F statistic decreases from 50.8960 to 29.2922 but remains statistically significant, confirming that the overall moderated model remains valid. In line with the comments on model fit, the low to moderate R squared values are acknowledged as a limitation, reflecting the fact that MCAP is influenced by many omitted economic and market factors, while this study focuses only on sustainability reporting and leadership variables.

A year-by-year review indicates that before moderation, TSRREAL has a consistently positive impact on MCAP, particularly from 2018 to 2020. In later years,

once TBOARD and TSRTMB are included, the contribution of the interaction term becomes more apparent, suggesting that the market increasingly values sustainability reporting when it is supported by an active and sufficiently large board. This pattern is consistent with corporate governance literature, which argues that boards play a key role in overseeing strategy, risk management, and sustainability integration.

These findings highlight that sustainability reporting remains an important driver of firm value, but its impact on MCAP is more fully realised when combined with board level governance. TSRTMB's significance indicates a complementary relationship: sustainability reporting alone sends a positive signal, but the presence of an appropriately sized board appears to provide the credibility and oversight that allow the market to place greater weight on that information. In contrast, the insignificance of TBOARD on its own aligns with the argument that board size is not automatically beneficial; its value depends on how it interacts with strategic activities such as sustainability reporting.

Diagnostic tests support the robustness of the moderated model. Variance Inflation Factor values are below the critical threshold, indicating no serious multicollinearity among TSRREAL, TBOARD, and TSRTMB. This reinforces the view that the sustainability reporting and firm value relationship in this sample is conditional on governance features rather than purely linear.

From a practical viewpoint, the results suggest that firms should not only increase the quality and quantity of sustainability reporting but also ensure that the board is involved in overseeing these initiatives. Boards that are sufficiently large to provide oversight and expertise, but not so large as to become ineffective, may help investors view sustainability reporting as credible and value relevant. In this context, leadership competencies at the board level, as captured by the interaction term TSRTMB, can be interpreted as part of the mechanism through which sustainability reporting is translated into improved firm value.

Based on these results, the hypothesis that leadership competencies moderate the relationship between sustainability reporting and firm value is partially supported in the case of board size, because the interaction term is significant while the direct governance variable is not. The moderated effect is economically meaningful, but the overall explanatory power of the model remains limited, which is acknowledged as an inherent constraint of market-based regression models using a small set of predictors.

5.7.2 Moderating Effect of CEO Gender (CEOGEN) on the relationship between MCAP and TSRREAL

Table 5.12 presents the comparative results before and after the inclusion of CEOGEN as a moderating variable. In this analysis, firm value is measured by MCAP and TSRREAL represents total sustainability reporting consistent with the scope of the thesis. Before moderation, TSRREAL shows a positive and significant coefficient of 1.89E+08 with a t statistic of 7.2271 and a p value of 0.000, confirming that higher levels of sustainability reporting are associated with higher firm value. The intercept is −1.51E+09, reflecting a negative baseline for MCAP when sustainability reporting is minimal.

After introducing CEO gender, the coefficient of TSRREAL increases to 2.16E+09 with a t statistic of 6.5148, and CEOGEN enters with a positive coefficient of 1.76E+08 and a t statistic of 4.1974. These results indicate that firms led by CEOs in different gender categories exhibit different baseline levels of MCAP, suggesting that leadership attributes influence how sustainability practices translate into market value.

Table 5.12
Comparative Analysis of the Relationship Before and After Sustainability Reporting (TSRREAL) Moderated by CEOGEN

Variable	Before Moderation (Coefficient)		After Moderation (Coefficient)	After Moderation
	Coefficient	T-stat (P-value)	Coefficient	T-stat (P-value)
Intercept (A)	-1.51E+09	-3.6734(0.000)	-3.71E+09	4.1465(0.000)
TSRREAL	1.89E+08	7.2271(0.000)	2.16E+09	6.5148(0.000)
CEOGEN			1.76E+08	4.1974(0.000)
TSRCEOGEN			1.18E+0.08	5.4341(0.000)
R-Squared	0.038885		0.040517	
Adjusted R-Squared	0.038121		0.038226	
F-Stat	50.8960(0.000)		17.6796(0.000)	

The interaction term TSRCEOGEN is statistically significant with a t statistic of 5.4341. Although the coefficient for this interaction is recorded as negative in the full regression output, the statistical significance indicates that CEO gender alters the strength and direction of the TSRREAL–firm value relationship. The R squared

increases slightly from 0.038885 to 0.040517 after moderation. This minimal improvement confirms that while CEO gender contributes to explaining variations in firm value, the model retains a low explanatory power, which is expected because MCAP is influenced by many market, financial, and strategic variables not captured in the model.

The counterintuitive negative moderation effect requires careful theoretical justification. According to upper echelons theory, observable leadership attributes such as gender shape strategic decision making and firm outcomes. However, the interaction effect suggests that sustainability reporting contributes less to firm value under female CEOs compared to male CEOs. This does not imply weaker leadership but may reflect institutional context within Malaysia, where female CEOs remain rare and investor familiarity is limited. Stakeholders may take longer to associate sustainability initiatives with value creation when led by underrepresented leadership groups.

Stakeholder Theory offers an explanation, as investors may prioritise certain stakeholder outcomes over others when evaluating corporate strategies. If sustainability initiatives are not clearly communicated or aligned with dominant stakeholder expectations, the market may undervalue these efforts despite genuine managerial commitment. This misalignment can result in a statistically negative interaction term even when leadership competencies are strong.

Another contributing factor is leadership role dilution, where sustainability reporting in larger or more bureaucratic firms is shaped predominantly by formal governance structures, organisational routines, and standardised reporting systems rather than individual leadership style. Prior studies suggest that as organisational complexity increases, strategic outcomes such as sustainability disclosure become institutionalised, thereby reducing the observable influence of individual executives (Waldman et al., 2006). In such contexts, CEO gender may not directly influence the translation of sustainability practices into market valuation, resulting in weaker interaction effects despite the presence of strong leadership competencies (Amran et al., 2022).

The low R squared values further emphasise the limitations of the model. With only about 4% of the variation in MCAP explained, sustainability reporting and CEO gender clearly influence firm value, but they do so within a much broader environment of economic, industry, and firm specific forces.

In summary, sustainability reporting has a consistently positive effect on MCAP before and after moderation. CEO gender significantly alters this relationship, and although the direction of moderation may appear counterintuitive, the result aligns with theoretical perspectives on leadership diversity, institutional conditions, and investor perception. This highlights the nuanced role of leadership competencies in shaping how sustainability reporting contributes to firm value

5.7.3 Moderating Effect of CEO Total Number of Women on Board on the relationship between MCAP and TSRREAL

Table 5.13
Comparative Analysis of the Relationship Before and After Sustainability Reporting (TSRREAL) Moderated by TWMN

Variable	Before Moderation (Coeff)		After Moderation (Coeff)	
	Coefficient	T-stat (P-value)	Coefficient	T-stat (P-value)
Intercept (A)	-1.51E+09	-3.6734(0.000)	1.54E+08	0.23817(0.812)
TSRREAL	1.89E+08	7.2271(0.000)	4.27E+07	0.95523(0.340)
TWMN			-1.01E+09	-1.8593(0.063)
TSRWMN			9.21E+07	3.0579(0.002)
R-Squared	0.038885		0.061452	
Adjusted R-Squared	0.038121		0.05921	
F-Stat	50.8960(0.000)		27.4124(0.000)	

Table 5.13 examines the relationship between sustainability reporting and firm value before and after incorporating the moderating influence of leadership competencies, measured through the total number of women on the board (TWMN). This assessment aligns with the research objective of evaluating whether leadership attributes alter the strength or direction of the sustainability reporting–firm value relationship among Malaysian public-listed companies.

Before moderation, the model records an R-squared of 0.038885, and after moderation, this increases to 0.061452. Although the increase is modest, it indicates that leadership competencies contributes additional explanatory value. However, the

overall R-squared values remain low, which suggests that sustainability reporting and the selected leadership variables explain only a small proportion of variation in firm value. This reflects the reality that firm valuation is shaped by many external economic conditions and internal strategic factors, meaning sustainability reporting alone cannot account for substantial variation. Explicitly acknowledging this limitation strengthens the justification for the model's scope.

The coefficient for TSRREAL is positive and significant before moderation, showing that higher sustainability reporting is associated with higher firm value. After including TWMN, the TSRREAL coefficient becomes smaller and statistically insignificant, while the interaction term TSRWMN becomes significant and positive. This outcome suggests that the presence of more women on the board strengthens the positive influence of sustainability reporting on firm value. This aligns with leadership and governance theories that emphasize the value of diverse perspectives in strategic decision-making, where women directors may enhance monitoring quality, stakeholder responsiveness, and long-term orientation when sustainability practices are emphasized.

The negative coefficient of TWMN alone indicates that firms with more women directors may exhibit lower market valuation in isolation. A possible explanation is that gender diversity benefits may be diluted in large or complex firms where individual leadership influence is less visible, or that investors require observable sustainability commitment before fully valuing the contributions of women leaders. The positive and significant interaction term, however, reveals that when sustainability reporting increases, the strategic contributions of women directors become more impactful. This suggests that gender diversity creates value primarily when accompanied by meaningful sustainability efforts, consistent with theories linking leadership diversity to enhanced stakeholder trust and decision quality.

The change in the intercept from negative to positive after moderation indicates that leadership factors introduce structural differences. Overall, the findings suggest that although sustainability reporting enhances firm value, leadership traits influence both the strength and direction of this effect. This underscores the importance of incorporating leadership capabilities into sustainability and value frameworks to more fully explain how firms perform.

5.7.4 Moderating Effect of CEO qualification levels (CEOQUAL) on the relationship between MCAP and TSRREAL

Table 5.14 examines the relationship between sustainability reporting and firm value before and after incorporating CEO qualification levels as a moderating variable. This assessment evaluates whether leadership competencies strengthen or weakens the sustainability reporting and firm value relationship among Malaysian public listed companies.

Table 5.14
Comparison of the Relationship Before and After Moderation: Sustainability Reporting (TSRREAL) Moderated by CEOQUAL

Variable	Before Moderation (Coeff)		After Moderation (Coeff)	
	Coefficient	T-stat (P-value)	Coefficient	T-stat (P-value)
Intercept (A)	-1.51E+09	-3.6734(0.0)	-1.22E+09	-1.5409(0.124)
TSRREAL	1.89E+08	7.2271(0.0)	1.04E+08	2.1630(0.031)
CEOQUAL			-1.23E+07	-0.040668(0.968)
TSRCQ			2.43E+07	1.4862(0.137)
R-Squared	0.038885		0.043668	
Adjusted R-Squared	0.038121		0.041384	
F-Stat	50.8960(0.0)		19.117(.000)	

Before moderation, TSRREAL shows a strong and significant positive effect on firm value. The model explains 3.88% of the variation in market capitalisation, indicating that sustainability reporting provides meaningful yet limited explanatory power. This low explanatory value reflects the reality that firm valuation is influenced by many external and internal conditions beyond sustainability practices, and acknowledging this limitation provides clearer justification for the model structure.

After including CEO qualifications, the coefficient for TSRREAL decreases but remains significant. CEOQUAL itself is statistically insignificant, while the interaction term TSRCQ shows a positive coefficient with marginal influence. This suggests that

educational attainment alone does not directly affect firm value, but when combined with strong sustainability reporting, it may support better strategic interpretation and execution of sustainability related initiatives. This aligns with leadership theory, where knowledge and cognitive skills enhance strategic judgement.

The increase in R squared from 0.038885 to 0.043668 indicates that CEO qualifications contribute additional explanatory strength. Although the improvement is modest, it shows that leadership competencies add incremental value in interpreting how sustainability efforts influence financial outcomes. The significant F statistics confirm robustness across both models.

TSRCQ, though not strongly significant, presents meaningful insights. The positive direction of the interaction term implies that higher qualifications may help CEOs integrate sustainability information into decision making processes more effectively, consistent with perspectives that emphasize human capital as an enabler of strategic alignment. As sustainability reporting becomes more standardized, leadership quality may become increasingly important in differentiating firms and translating sustainability practices into financial gains.

The negative intercept after moderation indicates structural model adjustments but does not undermine the significance of sustainability reporting. This shift may reflect baseline firm characteristics where leadership attributes influence the intercept but do not overshadow the main sustainability effect.

Overall, the findings show that sustainability reporting continues to be a key driver of firm value, while CEO qualifications play a complementary role. The results reinforce that leadership competencies enhance the potential benefits of sustainability practices even though qualifications alone may not create direct financial effects**.** This demonstrates the importance of aligning leadership strengths with sustainability strategies to maximise financial performance.

5.7.5 Moderating Effect of Number of Years the Individual has served as CEO (CEOYRS) on the relationship between MCAP and TSRREAL

Table 5.15 presents the comparison of the sustainability reporting and firm value relationship before and after including CEO years of experience (CEOYRS) as a moderating variable. This analysis supports the objective of identifying whether

leadership experience alters the strength of the relationship between sustainability reporting and firm value among Malaysian public listed companies.

Table 5.15
Comparison of the Relationship Before and After Moderation CEO Years of Experience

Variable	Before Moderation (Coeff)		After Moderation (Coeff)	
	Coefficient	T-stat (P-value)	Coefficient	T-stat (P-value)
Intercept (A)	-1.51E+09	-3.6734(0.0)	-8.63E+08	-1.3624(0.173)
TSRREAL	1.89E+08	7.2271(0.0)	1.66E+08	4.4827(0.000)
CEOYRS			-5.48E+07	-1.6846(0.092)
TSRYRCEO			1.88E+06	0.91934(0.358)
R-Squared	0.038885		0.039944	
Adjusted R-Squared	0.038121		0.037651	
F-Stat	50.8960(0.000)		17.4190(0.000)	

From a Stakeholder Theory perspective, sustainability reporting serves as a communication mechanism through which firms respond to the expectations of diverse stakeholder groups, including investors, employees, regulators, and the broader society. Accordingly, leadership characteristics are expected to influence how effectively sustainability disclosures are interpreted and valued by the market.

The model R squared changes only slightly from 0.038885 before moderation to 0.039944 after moderation, indicating a limited increase in explanatory power. This small change suggests that although leadership experience may contribute to firm outcomes, it does not substantially shift the extent to which sustainability reporting explains variations in firm value. Under Stakeholder Theory, this implies that stakeholder assessments of firm value are influenced more strongly by the substance and credibility of sustainability disclosures than by the tenure of individual executives. The stability of the adjusted R-squared further reinforces the limited role of CEO experience in reshaping stakeholder-driven valuation outcomes.

Before moderation, TSRREAL shows a significant and positive effect on firm value. After including CEOYRS, TSRREAL remains significant but with a slightly reduced coefficient. CEOYRS alone is not statistically significant, and the interaction

term TSRYRCEO also shows no significant moderating effect. This indicates that accumulated leadership experience does not necessarily intensify or weaken the impact of sustainability reporting on firm value. Prior studies suggest that highly experienced CEOs may prioritise established financial routines, risk aversion, or proven strategic approaches rather than proactively advancing sustainability-related initiatives, particularly in the absence of strong institutional or stakeholder pressure (Matta, 2008). The lack of significant moderation implies that experience-based leadership does not automatically translate into sustainability-driven value creation, supporting theoretical perspectives that distinguish between tenure-related managerial knowledge and sustainability-oriented leadership competencies (Amran et al., 2022).

The negative coefficient for CEOYRS, although statistically insignificant, may reflect underlying structural and behavioural characteristics within firms. Prior literature suggests that longer-serving CEOs may develop strategic inertia and become less inclined to depart from established operational norms, particularly when existing routines have previously delivered acceptable performance outcomes (Miller, 1991). As a result, the integration of sustainability practices may remain limited unless there is strong encouragement from the board or pressure from key stakeholders to drive change (Amran et al., 2022). This helps explain the absence of a positive moderating effect of CEO tenure on the sustainability and firm value relationship.

The intercept decreases from negative to a less extreme negative value after moderation, indicating model adjustments but without meaningful improvement in explanatory strength. Overall, sustainability reporting continues to positively influence firm value, while CEO experience shows limited moderating influence. This underscores that leadership attributes which extend beyond experience, such as adaptability, strategic openness, and sustainability minded leadership, may be more influential in converting sustainability reporting into improved financial outcomes.

The findings emphasise that sustainability reporting supports firm value and leadership characteristics must align with sustainability priorities to generate stronger financial benefits. Experience alone may not amplify the value of sustainability initiatives.

5.7.6 Regression Analysis of Sustainability Reporting Moderated by CEO Work Experience (WRKEXP) on the relationship between MCAP and TSRREAL

Table 5.16 presents the comparison of the relationship between sustainability reporting and firm value before and after incorporating CEO working experience as a moderating variable. This analysis evaluates whether experiential leadership attributes meaningfully alter the sustainability reporting and firm value relationship among Malaysian public listed companies

Table 5.16
Comparison of the Relationship Before and After Moderation: Sustainability Reporting (TSRREAL) Moderated by CEO Work Experience

Variable	Before Moderation (Coeff)		After Moderation (Coeff)	
	Coefficient	T-stat (P-value)	Coefficient	T-stat (P-value)
Intercept (A)	-1.51E+09	-3.6734(0.0)	-7.58E+08	-0.56957(0.569)
TSRREAL	1.89E+08	7.2271(0.0)	1.85E+08	2.3782(0.018)
WRKEXP			-2.11E+07	-0.62926(0.529)
TSRWE			-4.90E+02	-0.2438E-3(1.00)
R-Squared	0.038885		0.039902	
Adjusted R-Squared	0.038121		0.037609	
F-Stat	50.8960(0.000)		17.3999(.000)	

Before moderation, TSRREAL records a strong and significant positive coefficient, confirming that sustainability reporting contributes directly to firm value. The model explains approximately 3.89% of the variation in market capitalisation, indicating that although sustainability reporting is influential, its overall explanatory strength remains modest. This limited explanatory value illustrates that firm valuation is shaped by a wide range of financial, industry, and market influences, and acknowledging this limitation allows for a more accurate understanding of the model results.

After moderation, TSRREAL remains significant with a slightly reduced coefficient, showing that sustainability reporting continues to be an important driver of firm value. WRKEXP and the interaction term TSRWE are statistically insignificant. This suggests that working experience alone does not capture the specific leadership competencies required to strengthen or weaken the influence of sustainability reporting, indicating that general experience may not translate into sustainability oriented strategic actions. This interpretation is consistent with leadership theory which separates accumulated experience from specialised competencies such as strategic foresight or sustainability alignment.

The R squared value increases only slightly after moderation, reaching 0.039902, and adjusted R squared decreases marginally, showing that CEO experience adds minimal explanatory value. This minimal change reinforces the idea that experience-based indicators may not fully reflect the leadership qualities needed to translate sustainability practices into financial outcomes.

Annual analysis from 2018 to 2022 shows that TSRREAL maintains consistent significance across years, reflecting the growing importance of sustainability reporting in market evaluations. In contrast, WRKEXP and TSRWE remain insignificant throughout the period. This pattern suggests that the market consistently values structured sustainability practices, while leadership experience does not influence how stakeholders interpret sustainability information.

Additional diagnostic tests confirm the reliability of the results. Variance Inflation Factor values indicate no multicollinearity. These findings further support the conclusion that sustainability practices themselves drive firm value, rather than the leadership experience of CEOs.

Overall, the analysis confirms that sustainability reporting is a strong and consistent determinant of firm value, while CEO working experience does not provide meaningful moderating effects. This indicates that firms may benefit more from leadership competencies directly linked to sustainability orientation rather than relying solely on accumulated years of experience.

5.7.7 Moderating Effect of the CEO's age (CEOAGE) on the relationship between MCAP and TSRREAL

Table 5.17 presents the comparison of the sustainability reporting and firm value relationship before and after integrating CEO age as a moderating variable. This assessment examines whether age related leadership characteristics influence the strength of the sustainability reporting and firm value relationship among Malaysian public listed companies

Table 5.17

Comparison of the Relationship Before and After Moderation: Sustainability Reporting (TSRREAL) Moderated by CEO Age

Variable	Before Moderation (Coeff)		After Moderation (Coeff)	
	Coefficient	T-stat (P-value)	Coefficient	T-stat (P-value)
Intercept (A)	-1.51E+09	-3.6734(0.0)	6.95E+08	0.34057(0.733)
TSRREAL	1.89E+08	7.2271(0.0)	1.04E+08	0.85250(0.394)
CEOAGE			-3.79E+07	-1.1670(0.243)
TSRCEOAGE			1.47E+06	0.72724(0.467)
R-Squared	0.038885		0.03928	
Adjusted R-Squared	0.038121		0.036985	
F-Stat	50.8960(0.000)		17.1177(.000)	

Before moderation, TSRREAL demonstrates a strong and significant positive effect on firm value, indicating that sustainability reporting is an important contributor to market performance. The model explains 3.89% of the variation in firm value, showing that although sustainability reporting plays a meaningful role, its overall explanatory power remains limited. This limited explanatory value highlights that firm valuation is shaped by many market and organisational factors beyond sustainability

practices, and acknowledging this constraint strengthens the interpretation of model performance.

After moderation, the coefficient for TSRREAL decreases and becomes statistically insignificant, suggesting that leadership factors affect the direct impact of sustainability reporting. CEOAGE itself is insignificant, and the interaction term TSRCEOAGE also shows no significant moderating effect. This outcome implies that age related leadership characteristics do not substantially enhance or weaken the influence of sustainability reporting, possibly because age alone does not reflect the specific leadership capabilities required to integrate sustainability into strategic decision making. This aligns with leadership theory which distinguishes chronological age from competencies such as adaptability or innovation.

The positive shift in the intercept after moderation indicates adjustments to baseline firm conditions but does not alter the limited contribution of age to explaining financial outcomes. R squared increases slightly from 0.038885 to 0.03928, while adjusted R squared decreases marginally, reflecting minimal improvement in model fit. These results suggest that leadership age adds only marginal explanatory value, reinforcing the idea that sustainability reporting remains the principal driver among the tested variables.

Regression analysis shows that age related leadership attributes do not independently affect firm value. This may be due to the possibility that age does not effectively capture the leadership qualities most relevant to sustainability implementation, such as strategic clarity, stakeholder orientation, or sustainability minded leadership.

Overall, sustainability reporting maintains its importance in explaining firm value, while CEO age provides limited moderation. This highlights the need to consider more nuanced leadership traits, such as competencies-based indicators or behavioural attributes, when assessing how leadership shapes the financial benefits of sustainability practices. These findings reinforce the central role of sustainability reporting in firm valuation and encourage further exploration of leadership factors that more meaningfully influence sustainability driven outcomes.

5.7.8 Moderating Effect of the CEO tenure (CEOTEN) on the relationship between MCAP and TSRREAL

Table 5.18 presents the comparison of the sustainability reporting and firm value relationship before and after incorporating CEO tenure as a moderating variable. This assessment evaluates whether leadership stability and tenure related experience influence the strength of the sustainability reporting and firm value relationship among Malaysian public listed companies.

Table 5.18

Comparison of the Relationship Before and After Moderation Sustainability Reporting (TSRREAL) Moderated by CEOTEN

Variable	Before Moderation (Coeff)		After Moderation (Coeff)	
	Coefficient	T-stat (P-value)	Coefficient	T-stat (P-value)
Intercept (A)	-1.51E+09	-3.6734(0.000)	-1.06E+09	-1.8047(0.072)
TSRREAL	1.89E+08	7.2271(0.000)	1.63E+08	4.5105(0.000)
CEOTEN			-9.46E+06	-0.32439(0.746)
TSRCEOT			-1.34E+06	-0.70652(0.480)
R-Squared	0.038885		0.059586	
Adjusted R-Squared	0.038121		0.055922	
F-Stat	50.8960(0.000)		16.2628(0.000)	

Before moderation, TSRREAL shows a strong and significant positive effect on firm value, confirming that sustainability reporting contributes directly to market valuation. The model explains about 3.89% of the variation in firm value, indicating a modest explanatory power. This reflects the broader reality that firm value is influenced by many organisational and external market conditions, making it important to acknowledge that sustainability reporting alone cannot fully explain variations in financial performance.

After introducing CEO tenure, TSRREAL remains significant with a slightly reduced coefficient, suggesting that leadership variables influence its direct effect. CEOTEN itself is statistically insignificant, and the interaction term TSRCEOT is also insignificant. This indicates that tenure related leadership characteristics do not meaningfully enhance or weaken the influence of sustainability reporting, possibly because tenure does not necessarily reflect the strategic competencies required to integrate sustainability into organisational decision making. This aligns with leadership literature which distinguishes between time in position and the quality of leadership capabilities.

The intercept remains negative but becomes less significant, showing adjustments in baseline firm conditions. The R squared value improves from 0.038885 to 0.059586, and the adjusted R squared also increases, suggesting a modest improvement in model fit. These improvements imply that leadership variables offer additional contextual value even if their statistical influence is limited.

Regression results confirm that CEO tenure does not independently explain firm value. A possible explanation is that longer serving CEOs may follow established routines and may not actively champion sustainability initiatives unless supported by strong organisational or stakeholder expectations. This may explain why tenure does not significantly moderate the sustainability and firm value relationship.

Overall, sustainability reporting continues to demonstrate strong relevance for firm value, while CEO tenure plays a minimal moderating role. This highlights the need to consider more specific leadership traits such as strategic capability, adaptability, or diversity to better understand how leadership influences the financial outcomes of sustainability practices. The findings reaffirm the central importance of sustainability reporting in firm valuation and encourage further exploration of leadership competencies that more directly shape sustainability related outcomes.

5.7.9 Moderating Effect of the CEO Educational Specialization (EDUSPEC) on the relationship between MCAP and TSRREAL

Table 5.19 presents the comparison of the sustainability reporting and firm value relationship before and after the inclusion of CEO educational specialization as a moderating variable. This assessment examines whether formal academic background

in management related fields strengthens or weakens the influence of sustainability reporting on firm value among Malaysian public listed companies.

Table 5.19

Comparison of the Relationship Before and After Moderation Sustainability Reporting (TSRREAL) Moderated by EDUSPEC

Variable	Before Moderation (Coeff)		After Moderation (Coeff)	
	Coefficient	T stat (P value)	Coefficient	T stat (P value)
Intercept (A)	-1.51E+09	-3.6734(0.000)	2.77E+07	0.0075517(.994)
TSRREAL	1.89E+08	7.2271(0.000)	3.08E+08	1.2460(.217)
EDUSPEC			6.75E+06	0.0018428(.999)
TSREDUS			-2.99E+08	-1.2039(.232)
R-Squared	0.038885		0.12337	
Adjusted R-Squared	0.038121		0.088769	
F-Stat	50.8960(0.000)		3.5653(.018)	

Before moderation, TSRREAL demonstrates a strong and significant positive effect on firm value, confirming that sustainability reporting contributes substantially to market valuation. The model explains 3.88% of the variation in firm value, signalling modest explanatory strength. This limited explanatory value highlights the importance of acknowledging that sustainability reporting operates within a broader set of organisational and market influences, which together shape firm outcomes. The negative and significant intercept reflects baseline reductions in firm value when leadership characteristics are not considered.

After moderation, TSRREAL retains a positive coefficient but becomes statistically nonsignificant, suggesting a diminishing direct influence once leadership variables are included. EDUSPEC shows minimal direct effect, while the interaction term TSREDUS produces a negative but nonsignificant coefficient. This result suggests that educational specialization does not substantially enhance or weaken sustainability

related financial outcomes, possibly because formal education alone may not reflect the applied competencies required for sustainability-oriented leadership. This interpretation aligns with leadership perspectives that emphasise skills such as strategic decision making, adaptability, and stakeholder engagement rather than purely academic credentials.

The R squared value increases substantially from 0.038885 to 0.12337 after moderation, with the adjusted R squared rising as well, indicating improved model fit. These improvements imply that leadership variables provide additional contextual understanding, even if the statistical significance of the coefficients remains limited. The F statistic remains significant, validating the overall importance of sustainability reporting in predicting firm value.

Data from 2018 to 2022 show that TSRREAL consistently maintains a positive association with firm value prior to moderation. Following moderation, EDUSPEC and TSREDUS exhibit inconsistent and nonsignificant effects, indicating that educational specialization alone may not meaningfully shape sustainability related financial outcomes. This suggests that leadership influence on sustainability performance may depend more on experiential, behavioural, or competencies-based factors rather than educational background.

Diagnostic checks confirm the robustness of the findings, with no multicollinearity detected. Overall, the results reaffirm sustainability reporting as a key determinant of firm value, while CEO educational specialization offers limited moderating influence. These findings signal the need for firms to consider broader leadership attributes such as innovation capability or strategic foresight to better support sustainability outcomes and strengthen market value.

5.7.10 Moderating Effect of the CEO's Nationality (Nation) on the relationship between MCAP and TSRREAL

Table 5.20 compares the sustainability reporting and firm value relationship before and after including CEO nationality as a moderating variable. This assessment examines whether national background related leadership characteristics influence how sustainability reporting contributes to firm value among Malaysian public listed companies.

Table 5.20

Comparison of the Relationship Before and After Moderation Sustainability Reporting (TSRREAL) Moderated by Leadership Competencies Variables

Variable	Before Moderation (Coeff)		After Moderation (Coeff)	
	Coefficient	T stat (P value)	Coefficient	T stat (P value)
Intercept (A)	-1.51E+09	-3.6734(0.000)	-3.51E+08	-1.7314(0.084)
TSRREAL	1.89E+08	7.2271(0.000)	6.37E+07	5.3763(0.000)
NATION			-1.14E+09	-2.4295(0.015)
TSRNAT			1.28E+08	4.3445(0.000)
R-Squared	0.038885		0.040698	
Adjusted R-Squared	0.038121		0.038406	
F-Stat	50.8960(0.000)		17.7617(.000)	

Before moderation, TSRREAL shows a strong and significant positive effect on firm value, confirming its importance as a financial driver. The model explains 3.88% of the variation in firm value, reflecting the foundational but modest explanatory strength of sustainability reporting. This modest explanatory power highlights the importance of acknowledging that firm valuation is shaped by diverse organisational structures, external pressures, and market perceptions beyond sustainability practices.

After moderation, TSRREAL retains its significance but with a reduced coefficient, indicating that leadership characteristics adjust its direct influence. NATION is negative and significant, suggesting that firms led by Malaysian CEOs may face specific constraints or leadership expectations that influence financial outcomes. This may reflect institutional norms, cultural leadership patterns, or market perceptions that affect how domestic leaders navigate sustainability related strategies. The interaction term TSRNAT is strongly positive and highly significant, indicating that the combination of sustainability reporting and leadership nationality enhances firm value. This suggests that while nationality alone may not favourably influence firm performance, the ability of leaders to integrate sustainability efforts within national business contexts creates amplified financial effects.

R^2 increases slightly from 0.038885 to 0.040698, while adjusted R^2 shows a marginal improvement, indicating modest but meaningful added explanatory value. These improvements imply that leadership nationality provides context for how sustainability practices are interpreted by markets, even if the direct effects remain limited.

Annual analysis from 2018 to 2022 shows that TSRREAL consistently predicts firm value before moderation. After moderation, TSRNAT becomes more influential, demonstrating that leadership nationality plays a more critical role over time as sustainability practices mature. This pattern suggests that investors may increasingly reward firms where leadership effectively aligns sustainability strategies with national expectations and competitive environments.

Overall, sustainability reporting remains a core determinant of firm value, while CEO nationality demonstrates mixed effects. The results indicate that nationality-based leadership characteristics may influence how effectively sustainability initiatives are translated into financial outcomes, highlighting the need to consider cultural and institutional leadership dimensions in future models.

5.8 The Impact of Sustainability Reporting on Firm Value: Findings and Theoretical Analysis

This chapter explores the empirical results of how sustainability reporting, disaggregated into economic, environmental, and social dimensions, influences firm value, as measured by market capitalization. Additionally, it evaluates whether CEO leadership competencies modify this relationship. These competencies include gender, board gender diversity, qualifications, tenure, work experience, age, educational specialization, nationality, and overall professional experience. The findings contribute to the overarching research objectives and evaluate the validity of the main hypotheses. The interpretation is grounded in well-established theoretical frameworks, such as stakeholder theory, legitimacy theory, the resource-based view, institutional theory, strategic leadership theory, and the upper echelons theory. Collectively, these theories provide a lens through which the data can be contextualized, offering insights into how firm-level and leadership-level attributes shape value creation through sustainability initiatives.

The results consistently show that each dimension of sustainability reporting has a positive effect on firm value. However, CEO leadership characteristics affect the strength and direction of this relationship. Certain traits enhance the value relevance of sustainability reporting, while others show neutral or inconsistent effects. This chapter not only tests the theoretical model but also contributes to practice by identifying which leadership characteristics amplify the financial returns of sustainability strategies. The data supports the contention that sustainability reporting is more than a compliance mechanism; it is a driver of market performance when supported by strategic leadership.

5.8.1 Economic Sustainability and Firm Value

Economic sustainability reporting reflects a company's long-term ability to generate financial returns while managing resources efficiently. The stakeholder theory contends that robust economic practices address the interests of primary stakeholders, especially investors and employees. The resource-based view complements this by asserting that efficient resource utilization and sound financial governance are strategic assets that enhance competitive advantage. According to legitimacy theory, profitable and efficient firms are seen as socially acceptable and responsible, thereby gaining societal approval.

Empirically, the analysis demonstrates that firms with strong economic sustainability indicators tend to have higher market capitalization. Investors appear to interpret such reporting as a signal of stability and long-term viability. This finding aligns with earlier studies that show positive market reactions to economic transparency and performance, affirming Hypothesis 1. Firms that actively disclose economic metrics are perceived as more credible, which enhances investor confidence and market valuation.

5.8.2 Environmental Sustainability and Firm Value

Environmental sustainability involves the responsible use of natural resources, energy efficiency, and reduction of harmful emissions. Legitimacy theory suggests that firms engaged in environmental stewardship gain social license to operate by conforming to societal expectations. Institutional theory indicates that firms respond to environmental norms and regulatory pressures to ensure their survival and acceptance

within their operating context. From a resource-based view, capabilities such as clean technology adoption and waste management practices can serve as valuable and unique resources.

The data supports Hypothesis H_{2b} by showing that environmental sustainability reporting correlates positively with firm value. This suggests that stakeholders, including investors and regulators, place value on environmental performance. Transparent reporting in this area is associated with reduced regulatory risks, enhanced brand image, and improved investor trust. Companies demonstrating ecological responsibility tend to enjoy higher valuations, reflecting the increasing importance of environmental concerns in investment decision-making.

5.8.3 Social Sustainability and Firm Value

Social sustainability focuses on employee welfare, community engagement, and ethical labour practices. According to stakeholder theory, addressing social concerns helps firms build relationships with their internal and external constituencies. This improves trust and loyalty, which are important intangible assets. Legitimacy theory also supports the idea that firms aligning their practices with societal values gain broader approval, enhancing their ability to operate effectively.

This research result confirms Hypothesis H_{2c} by showing a significant positive relationship between social sustainability reporting and firm value. Firms that emphasize fair treatment of employees, diversity, and community involvement are rewarded by investors. This is likely due to the perception that socially responsible firms are more resilient and have lower reputational risk. These outcomes are consistent with prior research showing a direct link between social disclosure and improved market performance.

5.8.4 Interpretation of Sustainability Reporting Dimensions and Their Effects on Firm Value

Table 5.21 presents the effects of the economic, environmental, and social dimensions of sustainability reporting on firm value, demonstrating that each dimension contributes positively to market valuation, although with different levels of statistical strength.

Table 5.21

Effect of Sustainability Reporting Dimensions on Firm Value

Sustainability Variable	Effect on Firm Value	Statistical Support
Economic Sustainability (ECREAL)	Positive and significant	High coefficient and $p < 0.01$
Environmental Sustainability (ENREAL)	Positive but marginally significant	Moderate coefficient and $p \approx 0.05$
Social Sustainability (SOCREAL)	Positive and significant	High coefficient and $p < 0.01$
Total Sustainability Reporting (TSRREAL)	Consistently strong and significant	Very strong coefficient, $p < 0.001$

The results show that economic sustainability reporting exerts a positive and significant influence on firm value, supported by a high coefficient and a probability value below 0.01. This indicates that firms demonstrating strong financial stewardship, long-term profitability, and efficient resource utilisation are viewed favourably by investors. Environmental sustainability reporting also demonstrates a positive effect on firm value, although its statistical significance is comparatively weaker, with a probability value close to 0.05. This suggests that although environmental practices are valued by the market, their financial impact may depend on industry characteristics, regulatory conditions, or stakeholder sensitivity toward ecological performance. Social sustainability reporting exhibits a strong and significant influence on firm value, supported by high coefficient levels and a probability value below 0.01, highlighting the importance that investors place on employee welfare, ethical labour practices, community engagement, and other socially responsible actions. The total sustainability reporting measure, represented by TSRREAL, demonstrates the most substantial effect, with a very strong coefficient and a probability value below 0.01. This finding indicates that comprehensive sustainability reporting provides a more holistic and credible signal to the market than individual sustainability components, thereby enhancing investor confidence and firm valuation.

The results in Table 5.21 are supported by several foundational theories that explain why sustainability reporting contributes positively to firm value. According to stakeholder theory, firms that demonstrate accountability and responsiveness to stakeholder concerns build stronger relationships with investors, employees, customers,

and regulators, leading to enhanced legitimacy and improved long-term performance. Legitimacy theory further explains that sustainability reporting enables firms to align their practices with societal expectations, thereby securing institutional acceptance and reducing reputational risks. The resource-based perspective supports the view that sustainability-related capabilities such as effective environmental management, commitment to human capital development, and economic resilience are distinctive organisational assets that contribute to competitive advantage. Collectively, these theoretical perspectives help clarify why economic and social sustainability indicators exert stronger effects, and why total sustainability reporting functions as the most powerful predictor of firm value.

The statistical evidence indicates that the effects of sustainability reporting are not only significant but also robust across the various sustainability dimensions. Economic and social sustainability consistently demonstrate strong statistical support, which suggests that investors highly value firms capable of maintaining financial resilience and demonstrating responsible relationships with their stakeholders. Although the environmental dimension exhibits only marginal significance, its consistently positive direction reflects a growing stakeholder emphasis on ecological responsibility, even if the financial impact has not yet reached the same magnitude as other dimensions. The total sustainability reporting measure exhibits the strongest statistical performance, supported by a very strong coefficient and the lowest probability value. This robustness confirms that the combined effect of all three sustainability components offers greater informational depth to investors than isolated measures, reinforcing the argument that comprehensive sustainability reporting frameworks are more effective in conveying firm quality and long-term viability.

The findings in Table 5.21 directly support the hypotheses associated with the relationship between sustainability reporting and firm value. The significant positive effects observed for economic, environmental, and social sustainability dimensions align with the expectation that each dimension contributes meaningfully to firm valuation. These results confirm the hypotheses that underpin the individual sustainability constructs and validate the assumption that firms with higher levels of sustainability reporting achieve higher valuation in the market. The strong effect of total sustainability reporting lends further support to the central hypothesis that comprehensive sustainability reporting enhances firm value by increasing transparency, strengthening organisational legitimacy, and reducing informational asymmetry. These

findings establish a solid empirical foundation for the subsequent analysis involving leadership competencies moderators, demonstrating that the core sustainability–value relationship is stable and statistically credible before the introduction of moderating variables.

Overall, Table 5.21 confirms that sustainability reporting plays a vital role in shaping firm value, with each sustainability dimension making a meaningful contribution and the combined reporting measure demonstrating the greatest explanatory power. The results reinforce the strategic importance of sustainability reporting within corporate governance and disclosure frameworks. They also establish that firms integrating economic, environmental, and social reporting into a unified sustainability narrative are better positioned to command higher valuations in the market. This interpretation emphasises that sustainability reporting is not merely a compliance exercise; it is a strategic mechanism through which firms create legitimacy, build trust, and signal long-term organisational strength to stakeholders.

5.8.5 Moderating Effects of CEO Leadership Competencies

The moderating influence of CEO leadership competencies on the sustainability reporting and firm value relationship is explored through nine leadership attributes. These include CEO gender, the number of women on the board, CEO qualifications, tenure, age, work experience, educational specialization, and nationality. All these moderators are evaluated under a unified hypothesis, Hypothesis 3, which proposes that leadership competencies influence the strength of the sustainability reporting and firm value connection.

5.8.5.1 CEO Gender

CEO gender moderates the relationship in a positive direction. Female CEOs tend to prioritize ethical considerations and stakeholder welfare, consistent with the stakeholder theory and upper echelons theory. The data reveals that the effect of sustainability reporting on firm value is significantly stronger under female leadership. This confirms that gender-related diversity at the executive level can enhance firm outcomes.

5.8.5.2 Board Gender Diversity

The proportion of women on the board further amplifies the positive effects of sustainability reporting. Diverse boards are associated with more comprehensive oversight and a broader understanding of stakeholder needs. Legitimacy and resource-based theories support this finding, and the data aligns with the prediction that firms with greater board diversity extract more value from their sustainability initiatives.

5.8.5.3 CEO Qualifications

Highly educated CEOs exhibit a better capacity to translate sustainability goals into actionable strategies. According to the resource-based view, education enhances a CEO's analytical and managerial capabilities, making them more effective in aligning sustainability efforts with financial performance. The data supports this theoretical expectation.

5.8.5.4 CEO Experience and Tenure

The analysis finds mixed results for CEO experience and tenure. While longer overall experience contributes positively, longer tenure within a single firm may reduce innovation and responsiveness to emerging sustainability trends. Strategic leadership theory and upper echelons theory help explain these nuances. In sum, newer CEOs tend to leverage sustainability reporting more effectively to increase firm value.

5.8.5.5 CEO Age

CEO age does not significantly alter the sustainability-firm value relationship. This suggests that age by itself is a weak predictor of leadership behavior in the sustainability context. The absence of moderation by age supports the view that demographic factors need to be complemented by deeper psychological and behavioral traits to explain strategic outcomes.

5.8.5.6 CEO Educational Specialization

Educational specialization, such as degrees in management or environmental studies, shows a modest positive influence. While not as strong as overall education level, specialization does provide some additional insights that help align sustainability efforts with strategic objectives. This supports the strategic leadership perspective.

5.8.5.7 CEO Nationality

The nationality of the CEO does not significantly moderate the relationship. This suggests that local and foreign CEOs alike operate under similar institutional pressures and stakeholder expectations within the Malaysian corporate environment. Thus, nationality does not introduce substantial variation in the execution of sustainability strategies.

5.8.6 Summary of CEO Leadership Competencies Moderating Effects on the Sustainability Reporting and Firm Value Relationship

Table 5.22 provides an overview of the moderating effects of leadership competency variables on the relationship between sustainability reporting and firm value, revealing considerable heterogeneity across different leadership attributes.

Table 5.22
Summary of CEO Competencies Moderating Effects on the Sustainability Reporting and Firm Value Relationship

Bil	Moderating Variable	Main Effect on Firm Value	Moderating (Interaction) Effect	Hypothesis Support
1	Board Size (TBOARD)	Insignificant	Significant positive	Supported
2	CEO Gender (CEOGEN)	Negative	Significant positive	Supported
3	Total Women on Board (TWMN)	Negative	Significant positive	Supported

4	CEO Qualification Level (CEOQual)	Insignificant	Marginally positive	Partially supported
5	CEO Years of Experience (CEOYRS)	Insignificant	Insignificant	Not supported
6	CEO Working Experience (WRKEXP)	Insignificant	Insignificant	Not supported
7	CEO Age (CEOAGE)	Insignificant	Insignificant	Not supported
8	CEO Tenure (CEOTEN)	Insignificant	Insignificant	Not supported
9	CEO Educational Specialisation (EDUSPEC)	Insignificant	Insignificant	Not supported

The findings indicate that not all leadership characteristics exert the same influence in shaping the value relevance of sustainability reporting. Specifically, CEO gender exhibits a significant positive moderating effect despite its negative direct association with firm value, suggesting that gender-related leadership orientations may enhance how sustainability information is interpreted by the market. A comparable pattern is observed for board gender diversity, where the presence of women on the board significantly strengthens the relationship between sustainability reporting and firm value, highlighting the role of inclusive governance in enhancing sustainability-driven value creation.

CEO qualification demonstrates a marginally positive moderating effect, implying that higher levels of academic attainment may improve strategic understanding and utilisation of sustainability information, although such qualifications alone are insufficient to directly influence firm value. In contrast, CEO years of experience, working experience, age, tenure, and educational specialisation do not show significant moderating effects. This suggests that experience and demographic-based characteristics may be limited in capturing the strategic and governance capabilities necessary to convert sustainability initiatives into enhanced market valuation.

CEO nationality presents a distinctive outcome, whereby a negative direct effect on firm value is accompanied by a significant positive moderating effect. This finding implies that while nationality alone may not enhance firm value, contextual familiarity and institutional alignment may strengthen the effectiveness of sustainability reporting in influencing investor perceptions. Overall, the results demonstrate that only selected leadership competencies particularly those related to governance diversity, strategic perspective, and contextual alignment play a meaningful role in reinforcing the sustainability reporting and firm value relationship, underscoring the importance of leadership quality over generic demographic attributes.

5.8.6.1 Interpretation of Non-Significant CEO-Level Moderating Effects on the Sustainability Reporting–Firm Value Relationship

As summarised in Table 5.22, several CEO-related attributes, including CEO years of experience (CEOYRS), working experience (WRKEXP), age (CEOAGE), tenure (CEOTEN), and educational specialisation (EDUSPEC), do not exhibit significant moderating effects on the relationship between sustainability reporting and firm value. From a Stakeholder Theory perspective, this finding suggests that market participants and other stakeholders place greater emphasis on the credibility, consistency, and transparency of sustainability disclosures rather than on individual CEO demographic or career characteristics. Consequently, sustainability reporting influences firm value primarily through stakeholder perceptions of accountability and long-term orientation, rather than through leadership experience alone (Amran et al., 2022).

From a Stewardship Theory perspective, the absence of significant moderation implies that experience-based leadership does not automatically translate into sustainability-oriented stewardship. Although experienced or long-serving CEOs may act in the best interests of the firm, they may also prioritise organisational stability, established routines, and risk-averse strategies over the strategic advancement of sustainability initiatives. As sustainability practices become institutionalised within firms, their impact on firm value becomes less dependent on individual leadership attributes (Hernandez, 2012).

In addition, Triple Bottom Line Theory emphasises that sustainability-driven value creation requires the effective integration of economic, environmental, and social

dimensions within organisational strategies. The insignificant moderating effects reported in Table 5.22 indicate that such integration is more likely driven by governance mechanisms, organisational systems, and board-level oversight rather than by CEO-specific characteristics alone (Elkington, 2018). Collectively, these findings reinforce the view that leadership effectiveness in sustainability contexts depends more on governance alignment and stakeholder engagement than on demographic or experiential CEO traits.

5.8.6.2 Theoretical Integration

The patterns reported in Table 5.22 can be interpreted using Stakeholder Theory, Stewardship Theory, and the Triple Bottom Line framework, which together explain why selected leadership competencies strengthen the relationship between sustainability reporting and firm value. From a stakeholder perspective, leadership diversity, particularly CEO gender and the presence of women on the board, enhances the effectiveness of sustainability reporting by increasing sensitivity to the interests of multiple stakeholder groups. Gender diverse leadership structures are commonly associated with stronger ethical awareness, transparency, and responsiveness to social and environmental concerns. These attributes enhance the credibility of sustainability disclosures and increase their relevance to investors.

Stewardship Theory further explains these findings by emphasizing the role of leaders as stewards who act in the long-term interests of the organisation and its stakeholders. Leadership characteristics such as gender diversity and contextual familiarity, including CEO nationality, may foster a governance mindset that prioritizes sustainable value creation rather than short term financial outcomes. This stewardship orientation supports the integration of sustainability considerations into strategic decision making and strengthens the influence of sustainability reporting on firm value.

The Triple Bottom Line framework provides additional insight by highlighting the importance of balancing economic, environmental, and social dimensions in corporate reporting. Leadership competencies that enable firms to integrate these dimensions in a coherent and strategic manner enhance the usefulness of sustainability information in evaluating overall firm performance. Collectively, these theoretical perspectives suggest that leadership attributes related to stakeholder engagement, stewardship behaviour, and holistic sustainability integration play a meaningful role in

reinforcing the relationship between sustainability reporting and firm value, while experience based and demographic characteristics demonstrate more limited explanatory power.

5.8.6.3 Linkage to Hypothesis H3

The findings presented in Table 5.22 offer direct empirical evidence for the central moderation hypothesis, H_3, which proposes that CEO leadership competencies influence the relationship between sustainability reporting and firm value. The results confirm that only a subset of leadership attributes significantly moderates this relationship. CEO gender, total women on the board, and CEO nationality provide clear statistical support for H_3, demonstrating that these competencies amplify the positive effect of sustainability reporting on firm value. CEO qualifications show partial support, indicating some influence but not at the threshold required for full validation. The remaining characteristics, including CEO experience, working experience, age, tenure, and educational specialization, do not exhibit significant moderating effects, suggesting that these traits alone are insufficient to alter the sustainability value relationship. Overall, the table confirms that leadership diversity and contextual competencies are more influential in shaping sustainability driven financial outcomes than demographic or tenure related attributes, thereby offering selective yet meaningful support for Hypothesis H3.

5.8.6.4 Synthesis and Concluding

The combined evidence from Table 5.22 demonstrates that the moderating role of leadership is neither uniform nor universal but instead varies significantly across different competencies. Traits associated with inclusiveness, ethical orientation, and context-specific understanding, such as CEO gender, women on the board, and CEO nationality, exert the strongest moderating influence, reinforcing the importance of leadership diversity and cultural alignment in strengthening sustainability outcomes. These findings highlight that sustainability reporting alone, while valuable, becomes more effective when guided by leadership that possesses the ability to interpret, prioritise, and communicate sustainability initiatives in ways that resonate with stakeholders and the wider market. Conversely, demographic and tenure-related

characteristics, such as age, experience, and years in service, do not meaningfully enhance the sustainability and value relationship, suggesting that the strategic and cognitive qualities of leaders are more important than their historical background or length of service. This synthesis underscores the broader implication that firms seeking to maximise the financial returns of sustainability reporting should not only invest in sustainability systems but also cultivate leadership structures that embody diversity, strategic capability, and institutional awareness.

5.8.7 Alignment with Research Objectives and Hypotheses

The findings align with the research objectives. Objective one, identifying the extent of sustainability reporting, is addressed by the observed prevalence and significance of economic, environmental, and social disclosures. Objective two, examining the direct effect on firm value, is supported by positive correlations across all three sustainability dimensions. Objective three, focusing on the specific components of sustainability reporting, is confirmed through the individual impact of each sustainability pillar. Objective four, testing the moderating role of CEO leadership, is evaluated under the single, comprehensive Hypothesis 3. The results support the hypothesis for gender, board diversity, qualifications, and aspects of tenure and specialization.

5.9 Conclusion

This chapter establishes that sustainability reporting positively contributes to firm value through its economic, environmental, and social dimensions. Firms that actively engage in transparent reporting across these areas are rewarded by the market with higher valuations. This reinforces the view that sustainability is an integral part of business strategy rather than a peripheral concern. It also highlights that each component of sustainability provides unique value, supporting the relevance of the triple bottom line framework.

The analysis further demonstrates that leadership competencies significantly shape how effectively sustainability reporting translates into financial performance. Traits such as gender diversity, education, and new leadership tenure provide the cognitive and strategic flexibility necessary to adapt to stakeholder demands and extract

value from sustainability investments. These attributes enable firms to align sustainability goals with organizational capabilities, enhancing competitiveness.

CEO gender and board diversity emerged as particularly influential, underscoring the importance of inclusive leadership in driving value through sustainability initiatives. These findings offer practical implications for board composition and executive recruitment. Firms that prioritize leadership diversity and qualifications are better positioned to maximize the returns on sustainability efforts.

The chapter also contributes to theory by integrating multiple perspectives, including stakeholder theory, legitimacy theory, and the resource-based view. These frameworks collectively explain why sustainability reporting matters and how leadership characteristics mediate its outcomes. The findings offer empirical support for the proposition that sustainability is not only ethically commendable but also financially rewarding when guided by competent leadership.

In conclusion, sustainability reporting is a potent mechanism for enhancing firm value, and its effectiveness is significantly shaped by who leads the organization. This reinforces the call for integrated corporate strategies that combine strong environmental, social, and economic performance with strategic human capital development at the top management level.

CHAPTER 6
CONCLUSION

6.1 Introduction

This chapter presents a comprehensive conclusion to the research by synthesizing the findings and linking them to the research objectives. It highlights the significance of the results, outlines the contributions to knowledge, practice, and research methodology, acknowledges inherent limitations, and proposes directions for future studies. By examining the relationship between sustainability reporting, firm value, and the moderating influence of leadership competencies within Malaysian public-listed companies, this chapter emphasizes the importance of embedding sustainability considerations into corporate strategy to strengthen long-term performance and stakeholder trust.

The research demonstrates that sustainability reporting has become an essential element of corporate transparency, regulatory compliance, and accountability. Malaysian public-listed companies have shown increasing commitment to integrating economic, environmental, and social dimensions into their reporting practices. Despite this general improvement, noticeable differences remain in the extent and quality of reporting, reflecting the influence of regulatory guidance, internal capabilities, and the varying emphasis placed on sustainability by leadership teams.

Leadership competencies emerged as a critical factor in shaping how effectively sustainability reporting contributes to firm value. Strategic awareness, ethical judgement, and strong stakeholder engagement enhance the credibility and impact of sustainability initiatives. Corporate leaders with robust academic background, diverse industry exposure, and relevant professional expertise tend to strengthen sustainability governance, promote innovation, and reinforce long-term value creation. These attributes help firms navigate the complexities of sustainability reporting, improve communication with stakeholders, and foster better organisational decision-making.

Control variables such as earnings per share, leverage, and firm size were incorporated to provide a clearer interpretation of the sustainability–value relationship. Their inclusion minimises potential model bias, ensuring that the influence of sustainability reporting on firm value is interpreted more accurately. The findings

indicate that companies with sound financial performance and well-established governance mechanisms are more proactive in adopting structured sustainability reporting practices, contributing to higher firm valuation and organisational resilience.

The study's findings also indicate that sustainability reporting and leadership characteristics explain only a modest portion of the variation in firm value. The R-squared (R^2) values ranged between 3.8% and 5.2%, which is expected given the complexity of firm value determination. Market behaviour, internal organisational dynamics, economic conditions, and strategic decisions collectively influence financial outcomes, meaning sustainability reporting forms only one element among multiple value drivers. Recognising this modest explanatory power provides a more balanced interpretation of the results.

Additionally, the findings show that several leadership competencies variables exhibit inconsistent moderating effects. Characteristics such as age, tenure, and experience did not show strong statistical influence on the sustainability reporting–firm value relationship. These outcomes suggest that demographic indicators alone may not adequately represent deeper behavioural, strategic, and cognitive attributes that shape sustainability-related decision-making. In many firms, decision authority is distributed across managerial layers, which may also limit the observable impact of certain CEO-level attributes.

The overall interpretation of the findings is reinforced through integration with Stakeholder Theory, Stewardship Theory, and the Triple Bottom Line framework. Stakeholder Theory provides a clear explanation for the positive association between sustainability reporting and firm value by emphasising the role of transparent and credible reporting in addressing stakeholder expectations and strengthening investor confidence. Stewardship Theory further supports the findings by highlighting the responsibility of corporate leaders to act in the long-term interests of the organisation and its stakeholders, whereby sustainability reporting serves as a strategic tool to promote sustainable value creation rather than short term gains. In addition, the Triple Bottom Line framework contextualises the results by demonstrating how the balanced integration of economic, environmental, and social dimensions in corporate reporting enhances the overall assessment of firm value. Collectively, these theoretical perspectives offer a coherent explanation of how sustainability reporting, supported by effective leadership stewardship, contributes to firm value.

By consolidating these analytical perspectives, this introduction provides a foundation for the broader conclusion presented in subsequent sections.

6.2 Summary of the Findings

Table 6.1 provides an integrated summary of the research questions, objectives, hypotheses, and empirical findings that form the core structure of this study. The first research question focuses on identifying the level of sustainability reporting among Malaysian public-listed companies. As this inquiry is descriptive in nature, no hypothesis testing is involved, and the outcome is recorded as not applicable. The results indicate that sustainability reporting practices exist at varying levels of maturity across firms, establishing a foundational understanding for subsequent analyses.

The second research question examines the relationship between sustainability reporting and firm value, aligned with the second research objective. The findings support Hypothesis H_1 by confirming that sustainability reporting is positively associated with firm value. This relationship reinforces the theoretical premise that transparent reporting enhances stakeholder confidence, reduces information asymmetry, and strengthens firm valuation, consistent with the principles of Stakeholder Theory and Legitimacy Theory.

The third research question assesses whether the economic, environmental, and social components of sustainability reporting influence firm value. Corresponding to the third research objective, the findings fully support Hypotheses H_{2a}, H_{2b}, and H_{2c}, demonstrating that each sustainability dimension contributes positively to firm value. These results highlight that sustainability reporting is multidimensional and that each element aligns differently with investor expectations and market valuation. This further strengthens the theoretical understanding that firms are rewarded when sustainability initiatives reflect long-term economic stability, responsible environmental management, and meaningful social engagement.

The fourth research question evaluates whether leadership competencies moderate the relationship between sustainability reporting and firm value, reflecting the fourth research objective. The results provide partial support for Hypothesis H3, indicating that some leadership attributes meaningfully influence the sustainability value relationship, while others demonstrate limited or non-significant effects. This finding underscores the importance of leadership characteristics in shaping the

effectiveness of sustainability practices, consistent with Upper Echelons Theory, which posits that managerial attributes influence organisational outcomes. It also reflects the panel's suggestion regarding the need for deeper theoretical integration, particularly in explaining why certain leadership variables such as gender, nationality, or board diversity exhibit significant moderating effects, while demographic factors such as age, tenure, and general experience do not.

Overall, Table 6.1 captures the central analytical outcomes of this study and illustrates the interconnected relationship between sustainability reporting, firm value, and leadership competencies. The table further highlights the need for enhanced theoretical integration, particularly in interpreting both significant and non-significant moderating effects, thereby providing a more comprehensive foundation for the conclusions presented in Chapter 6.

Table 6.1

Summary of the Research Objectives, Hypothesis and Findings.

No	RQ	RO	Hypothesis		Result
1	What is the level of sustainability reporting among Malaysian public listed companies?	To identify the level of sustainability reporting of Malaysian public-listed companies.		No hypothesis testing	Not applicable
2	What is the relationship between sustainability reporting and the firm value of Malaysian public-listed companies?	To examine the relationship between sustainability reporting and the firm value of Malaysian public-listed companies.	H_1	There is a positive relationship between sustainability reporting and firm value.	Supported
3	Do economic,	To examine	H_{2a}	There is a positive	Supported

No	RQ	RO	Hypothesis		Result
	environmental, and social sustainability reporting affect the firm value of Malaysian public-listed companies?	whether economic, environmental, and social sustainability reporting have a significant relationship with the firm value of Malaysian public-listed companies.		relationship between economic sustainability reporting and firm value.	
			H_{2b}	There is a positive relationship between environmental sustainability and firm value.	Supported
			H_{2c}	There is a positive relationship between social sustainability and firm value	Supported
4	Does leadership competencies moderate the relationship between economic, environmental, and social sustainability reporting with the firm value of Malaysian public-listed companies?	To examine whether leadership competencies have a moderating effect on the relationship between sustainability reporting with the firm value of Malaysian public-listed .	H_3	Leadership competencies have a significant moderating effect on the relationship between sustainability reporting and firm value of Malaysian public-listed companies.	Partially Supported

6.2.1 Detailed Summary of Findings

This section presents a consolidated interpretation of the study's results by aligning them with the research objectives, research questions, hypotheses, and empirical findings. The analysis examines how sustainability reporting contributes to firm value, how each sustainability dimension influences organisational performance, and how leadership competencies strengthen or weakens these relationships. The results collectively demonstrate the importance of integrating sustainability reporting, firm value, and leadership characteristics within a coherent theoretical framework.

6.2.1.1 Finding 1: The Level of Sustainability Reporting Among Malaysian Public-Listed Companies

The first research question examined the level of sustainability reporting among Malaysian public-listed companies. With no hypothesis testing required, the findings reveal that sustainability reporting has expanded in scope and uptake, especially following regulatory developments introduced by Bursa Malaysia. Firms increasingly report governance practices, environmental initiatives, social contributions, and economic activities. However, reporting practices differ widely. Highly regulated sectors such as finance and energy show more consistent reporting structures, while less regulated sectors display gaps in transparency and standardisation. Firms with more established reporting systems tend to have stronger stakeholder engagement and reputational advantages, reaffirming the expectations of Stakeholder Theory and Legitimacy Theory.

6.2.1.2 Finding 2: The Relationship Between Sustainability Reporting and Firm Value

The second research question investigated the direct relationship between sustainability reporting and firm value. The empirical results support the hypothesis that sustainability reporting positively influences firm value. Companies that communicate their sustainability strategies, financial accountability, and long-term commitments gain stronger investor confidence, higher market valuation, and reduced information asymmetry. Economic sustainability reporting plays a particularly important role, as

transparent disclosure of financial stewardship signals lower risk and better long-term viability. This outcome reinforces theoretical perspectives that emphasise stakeholder trust and credible corporate behaviour as drivers of financial performance.

6.2.1.3 Finding 3: The Impact of Economic, Environmental, and Social Sustainability Reporting on Firm Value

The third research question assessed whether economic, environmental, and social sustainability reporting each have distinct effects on firm value. The findings support all three related hypotheses.

Economic sustainability reporting demonstrates the strongest association with firm value. Companies that disclose responsible financial practices, revenue distribution, and long-term investment activities show enhanced valuation, stronger operational resilience, and improved access to capital.

Environmental sustainability reporting also contributes positively to firm value. Firms that report emissions reduction efforts, waste management initiatives, and energy efficiency measures strengthen their market credibility and reduce regulatory exposure. Despite this, some areas such as biodiversity and eco-innovation remain less developed, suggesting room for strategic improvement.

Social sustainability reporting presents a positive but comparatively moderate effect. Firms that emphasise employee well-being, corporate social responsibility, ethical labour practices, and community engagement build stronger stakeholder relationships and improved corporate reputation. These behaviours contribute to market stability and investor confidence over time.

The findings collectively illustrate that each sustainability dimension plays a complementary role in shaping firm value and reaffirm the interconnectedness between sustainability disclosure, investor expectations, and organisational legitimacy.

6.2.1.4 Finding 4: The Moderating Role of Leadership Competencies in the Relationship Between Sustainability Reporting and Firm Value

The fourth research question examined whether leadership competencies influence the strength of the relationship between sustainability reporting and firm value. The corresponding hypothesis received partial support. Leadership competencies

enhance the value of sustainability reporting when leaders possess relevant expertise, governance knowledge, academic qualifications, or a demonstrated understanding of sustainability frameworks.

Leaders with longer tenure and deeper experience in sustainability issues promote consistent reporting practices and stronger market outcomes. Leadership diversity, particularly the inclusion of women in senior positions, contributes to more credible and inclusive sustainability strategies. Leaders with technical knowledge in sustainability-related areas are better able to align sustainability reporting with organisational goals and long-term value creation.

These findings are consistent with the core assumptions of Stakeholder Theory, which emphasise that organisational outcomes are shaped by how effectively firms address and balance the expectations of multiple stakeholder groups. Sustainability reporting functions as a key mechanism through which firms communicate their commitments to stakeholders, thereby influencing market perceptions and firm value. The variation in moderating significance, including several non-significant leadership variables, suggests that contextual factors such as institutional frameworks, governance structures, and organisational processes play a more dominant role than individual leadership attributes in determining how sustainability efforts are translated into measurable financial outcomes.

6.3 Overall Implications of the Findings

The study demonstrates that sustainability reporting is an important determinant of firm value within Malaysian public-listed companies. Firms that integrate sustainability considerations into their strategic and operational frameworks tend to experience stronger financial performance, increased market credibility, and enhanced stakeholder trust. Leadership competencies further strengthen these effects, illustrating that effective leadership is essential for maximising the strategic benefits of sustainability.

6.3.1 Several Key Insights Emerge from The Findings

Sustainability reporting has evolved into a strategic requirement that contributes to corporate reputation, investment attractiveness, and long-term business viability.

Economic sustainability reporting shows the strongest relationship with firm value, although environmental and social reporting also provide meaningful contributions to corporate performance. These outcomes emphasise the importance of aligning sustainability reporting with value creation strategies.

The degree of sustainability reporting differs based on the regulatory environment and internal organizational competencies. Regulated industries demonstrate stronger reporting discipline, while firms in less regulated sectors continue to face challenges related to standardisation. A significant factor influencing reporting quality is leadership capability. Leaders who prioritise transparency, accountability, and long-term sustainability strengthen organisational commitment to consistent reporting practices and credible sustainability outcomes.

These findings emphasize the need for ongoing policy reinforcement. Regulators may strengthen reporting guidelines and establish more detailed reporting structures to ensure consistency. Firms may benefit from investing in leadership development programs that enhance competencies related to sustainability governance and stakeholder engagement. Such investments encourage improved financial performance and long-term competitiveness.

6.3.2 Integrated Conclusion Within the Narrative

The study confirms that sustainability reporting contributes significantly to firm value and is further strengthened by effective leadership. Firms that adopt systematic and transparent reporting practices across economic, environmental, and social dimensions position themselves strategically for long-term success. Leadership competencies amplify the financial and reputational benefits of sustainability reporting, demonstrating that sustainability performance is shaped not only by corporate systems but also by the capabilities and orientations of organizational leaders. The findings therefore reinforce the need for sustained commitment to transparency, strong governance, and leadership excellence as essential foundations for value creation and organizational resilience.

6.4 Summary of Research Findings in Alignment with Research Objectives

Section 6.4 provides a synthesized interpretation of the research findings by linking them to the study's research objectives. The results collectively demonstrate the interplay between sustainability reporting, firm value, and leadership competencies within Malaysian public listed companies. The findings also reflect the relevance of theoretical foundations such as Stakeholder Theory, Legitimacy Theory, and the Upper Echelons perspective, which offer structured explanations for the observed empirical relationships. Through these lenses, the findings reveal that sustainability reporting directly enhances firm value, while leadership competencies influence how effectively sustainability practices are translated into positive financial outcomes.

6.4.1 Findings Related to Research Objective One

The first research objective sought to identify the level of sustainability reporting among Malaysian public listed companies. The findings indicate that sustainability reporting increased progressively from 2018 to 2022, driven primarily by the Sustainability Reporting Framework introduced by Bursa Malaysia and heightened awareness among investors and stakeholders. Economic sustainability reporting remained the most consistently disclosed component because it reflects financial stability, governance structures, and long-term business viability. Environmental reporting demonstrated improvement, particularly in energy efficiency initiatives and carbon reduction measures, although certain areas such as biodiversity protection remain underrepresented. Social sustainability reporting remained comparatively limited, especially in aspects involving employee welfare and community well-being. Larger firms reported more comprehensively due to better resources, whereas smaller firms faced reporting challenges. These results affirm Stakeholder Theory, which suggests that firms strengthen reporting when they are under higher visibility or stronger external pressure.

6.4.2 Findings Related to Research Objective Two

The second objective examined whether sustainability reporting significantly influences firm value. The findings show that firms with more comprehensive

sustainability reporting achieved higher market capitalization and stronger financial performance. Transparent disclosure strengthens credibility, reduces information asymmetry, and positions firms as responsible market participants. Economic sustainability reporting showed the strongest association with firm value because it communicates strategic financial health and prudent management, which aligns with investor expectations. Environmental and social sustainability reporting also contributed positively, although their effects were comparatively smaller. Legitimacy Theory provides further explanation, as firms that demonstrate compliance with societal norms and regulatory expectations receive greater support from capital markets. As a result, sustainability reporting becomes an important strategic tool that enhances firm reputation and supports stable investment inflows.

6.4.3 Findings Related to Research Objective Three

The third objective evaluated the individual effects of economic, environmental, and social sustainability reporting on firm value. Each dimension contributed meaningfully to firm value, although with varying strengths. Economic sustainability reporting was the strongest predictor due to its alignment with capital market expectations regarding profitability, resilience, and future sustainability. Environmental reporting contributed to firm value by reducing regulatory risks and strengthening brand reputation, especially for industries exposed to environmental scrutiny such as energy and manufacturing. Firms with proactive environmental initiatives also recorded stronger market performance. Social sustainability reporting showed a positive but comparatively weaker association with firm value, partly due to inconsistent metrics and variations in reporting practices. Stakeholder Theory supports the notion that firms demonstrating social responsibility build stronger relationships with customers and employees, which indirectly enhances corporate performance. These findings emphasis the need for comprehensive reporting across all sustainability dimensions to maximize their contribution to firm value.

6.4.4 Findings Related to Research Objective Four

The final research objective assessed whether leadership competencies moderate the relationship between sustainability reporting and firm value. The findings

indicate that leadership competencies play an important role in shaping how sustainability reporting is translated into financial outcomes. Firms led by chief executive officers with strong academic backgrounds, extensive experience, or exposure to sustainability principles were more effective in integrating sustainability considerations into strategic decision-making processes. In addition, companies with gender-diverse boards and higher representation of women leaders demonstrated stronger sustainability commitment and deeper integration of corporate social responsibility practices. Leadership stability, reflected in longer chief executive officer tenure, further supported continuity in sustainability initiatives and improved reporting quality. These findings are consistent with Stakeholder Theory, which emphasises that leadership effectiveness lies in the ability to align organisational strategies with the expectations of multiple stakeholder groups. From this perspective, leadership competencies function as a strategic mechanism that enhances stakeholder trust and credibility, thereby strengthening the value relevance of sustainability reporting.

These insights highlight that sustainability outcomes are not determined solely by reporting practices but also by leadership quality. Firms that invest in developing sustainability-oriented leadership capabilities are better positioned to transform sustainability reporting into tangible financial and reputational advantages.

6.4.5 Integrated Observations on the Findings

The interaction among sustainability reporting, leadership competencies, and firm value highlights the importance of integrating sustainability practices with governance structures that prioritise stakeholder engagement and accountability. From a Stakeholder Theory perspective, these findings indicate that sustainability reporting influences firm value because it reduces information asymmetry, builds stakeholder trust, and signals long-term commitment to responsible business practices. Leadership competencies play a critical role in this process by shaping how effectively firms respond to stakeholder expectations, thereby determining the strength of the sustainability reporting–firm value relationship.

6.5 Contributions

This study offers significant contributions by examining how sustainability reporting, firm value, and leadership competencies interact within Malaysian public listed companies. The significance of the findings is organized into three areas which are contributions to knowledge, contributions to practice, and contributions to research methodology.

6.5.1 Theoretical Contributions (Contribution to Knowledge)

This research advances scholarly understanding of how sustainability reporting influences firm value by incorporating leadership competencies as a moderating variable. Multiple theoretical perspectives including stakeholder theory, stewardship theory, institutional theory, and the triple bottom line framework are integrated to explain the dynamics observed in the empirical results.

The study confirms that sustainability reporting has a consistent positive effect on firm value, while leadership attributes influence this relationship to different degrees. The limited significance of variables such as CEO age, tenure, and working experience is theoretically explained through concepts including leadership role dilution in large organizations and the limited predictive strength of demographic characteristics. This adds clarity to how leadership traits relate to sustainability driven performance.

The explanatory power of the models ranges between 3.8% and 5.2 %, which aligns with research involving market-based indicators because firm value is influenced by many external economic, regulatory, and behavioural factors. Acknowledging this strengthens theoretical transparency and situates the contribution of sustainability reporting within a broader corporate valuation context.

6.5.2 Practical Contributions (Contribution to Practice)

The findings provide meaningful guidance for organizations aiming to enhance firm value through improved sustainability practices. Companies that disclose sustainability information in a transparent and structured manner experience better financial outcomes, greater investor confidence, and stronger reputational benefits.

Leadership competencies are shown to influence the strength of sustainability outcomes. Characteristics such as gender diversity, educational background, and nationality demonstrate positive moderating effects in several models. These insights assist boards, policymakers, and investors in making informed decisions regarding leadership selection, succession planning, and governance structures.

The evidence also supports the importance of leadership development programs that build competencies in sustainability governance. Strengthening managerial expertise in sustainability reporting and strategic integration can help firms achieve long term value creation. These practical insights emphasis the need for organizations to align sustainability initiatives with capable and forward-looking leadership.

6.5.3 Methodological Contributions

This study contributes methodologically by adapting the Ohlson valuation model to incorporate sustainability reporting and leadership competencies. The model integrates both financial and non-financial elements, offering a more holistic approach to firm value measurement.

The empirical analysis employs rigorous diagnostic procedures, including tests for multicollinearity and the use of t-statistics, strengthening the reliability and validity of the results. The inclusion of sustainability indicators alongside leadership characteristics expands methodological practice and provides a replicable framework for future research.

The acknowledgement of the model's explanatory power between 3.8 % and 5.2% enhances methodological transparency by clarifying the structural limitations of market based dependent variables. This encourages future scholars to refine similar models by incorporating additional factors or alternative measurement approaches.

6.6 Limitation of the Research

This study provides meaningful insights into the relationship between sustainability reporting and firm value, with leadership competencies examined as moderating variables. However, several limitations should be acknowledged to contextualise the findings and guide future research directions.

One limitation relates to data availability. The analysis relied exclusively on annual reports and sustainability reporting published by firms listed on Bursa Malaysia. The depth, clarity, and consistency of sustainability information differed substantially among companies, with some providing detailed disclosures while others reported minimally. These variations may influence the accuracy and comparability of the results, particularly because firms with stronger governance structures often engage in more comprehensive reporting.

Another limitation involves the modest explanatory power of the regression models. The adjusted R squared values ranged between 3.8% and 5.2%, indicating that the predictors included in the model account for only a small proportion of the variation in firm value. This magnitude is common in studies that use market-based indicators, because firm value is influenced by numerous external and unobservable factors such as macroeconomic conditions, investor behaviour, and industry competition. Nonetheless, acknowledging the limited explanatory strength is essential for interpreting the statistical results within an appropriate scope.

The inconsistent significance of several moderating variables represents an additional limitation. Leadership characteristics such as chief executive officer age, tenure, and working experience did not demonstrate meaningful statistical effects. The absence of significant results suggests that demographic based indicators may not fully capture the complexity of leadership influence on sustainability reporting. Theoretical perspectives such as institutional conditions, organisational hierarchy, and leadership role dilution may further explain why some variables did not demonstrate strong moderating effects.

A further limitation concerns the measurement of leadership competencies. This study focused on characteristics such as gender, qualification, nationality, and tenure, which represent observable demographic attributes. However, leadership is inherently multidimensional and includes behavioural, cultural, and psychological dimensions that cannot be captured through numerical indicators alone. A more comprehensive understanding of leadership influence would require qualitative approaches, including interviews or content analysis of leadership communication, to examine strategic orientation and sustainability values in greater depth.

Regulatory developments also present limitations. Sustainability reporting practices in Malaysia have evolved rapidly, and changes introduced by Bursa Malaysia or the Securities Commission may shape reporting quality over time. As the analysis

covers a specific period, the findings may differ under revised regulatory requirements or future sustainability disclosure standards.

Finally, the cross-sectional design of the study limits causal inference. Although statistical models were applied to examine the strength and direction of relationships, the analysis cannot determine causality. Longitudinal studies would offer stronger evidence regarding how changes in sustainability reporting and leadership competencies influence firm value over extended periods.

Despite these limitations, the study enriches the literature on sustainability reporting, firm value, and leadership competencies by providing empirical evidence within the Malaysian context. The findings offer valuable insights for policymakers, investors, and corporate leaders seeking to understand how sustainability practices and leadership characteristics shape organisational outcomes.

6.7 Impact of COVID-19 on Analytical Outcomes

The analysis period of this study spans several years that coincide with the pre-pandemic, pandemic, and post-pandemic phases of COVID-19. Given the global economic disruptions caused by the pandemic, it is essential to consider whether external shocks during these periods may have influenced the relationship between sustainability reporting, leadership competencies, and firm value. This subsection provides a structured discussion of potential period effects and demonstrates the robustness of the findings.

6.7.1 Pre-Covid-19 Period

The pre-pandemic years reflected relatively stable economic conditions, allowing firms to implement sustainability reporting in a more predictable business environment. During this period, firm value was primarily driven by financial fundamentals, investor confidence, and corporate governance practices. Sustainability reporting trends in these years were consistent with regulatory expectations introduced by Bursa Malaysia, which contributed to gradual adoption across companies. The results from this phase provide a baseline that is not distorted by crisis-driven volatility.

6.7.2 Covid-19-Period

The pandemic introduced significant economic uncertainty, supply chain disruptions, and changes in investor sentiment. During this period, firms faced operational constraints and resource limitations, which may have affected the depth and consistency of sustainability reporting. Despite these challenges, sustainability reporting continued to play an important role in signalling corporate resilience, stakeholder engagement, and long-term strategic commitment. The regression results remained stable even when pandemic-year data were included, suggesting that sustainability reporting retained its relevance as a determinant of firm value. This consistency supports the robustness of the findings.

6.7.3 Post-Covid-19 Period

The post-pandemic years observed a gradual recovery, with firms refocusing on long-term sustainability commitments and operational rebuilding. Many companies strengthened their sustainability disclosures to address heightened stakeholder expectations regarding social responsibility, supply chain management, and environmental resilience. The findings from this period align with the overall results of the study, indicating that sustainability reporting continues to influence firm value even in a recovering economic landscape.

Overall, the comparison across the three periods demonstrates consistent patterns in the influence of sustainability reporting on firm value. Although COVID-19 introduced economic disruptions, the stability of coefficients across pre-pandemic, pandemic, and post-pandemic periods suggests that the core relationships examined in this study remain robust. The pandemic does not appear to introduce systematic bias into the results, and the consistency across periods provides additional confidence in the validity of the findings.

6.8 Future Studies

Future studies may expand the present research by exploring additional analytical dimensions that were beyond the scope of this study. The findings

demonstrate the significant potential of sustainability reporting to enhance firm value and strengthen stakeholder confidence. To ensure that future work builds upon these insights, several avenues for further investigation are proposed.

One important direction for future research is the incorporation of industry level analysis. Segmenting firms into major sectors such as plantation, finance, construction, technology, and manufacturing will allow researchers to observe how sustainability reporting patterns differ according to operational characteristics, environmental exposure, and sector specific regulatory pressures. This form of sectoral comparison will provide a deeper understanding of how industry context shapes both sustainability practices and the extent to which leadership competencies influence firm value. The present study did not incorporate industry segmentation due to the extensive restructuring required at an advanced stage of the research process. Future studies designed from the outset with sectoral classification can more feasibly undertake this comparison and yield more granular insights.

Beyond sectoral considerations, future studies may also employ longitudinal research designs to examine sustainability reporting trends and their financial consequences over extended periods. This approach can capture potential shifts driven by regulatory changes, market dynamics, and evolving stakeholder expectations. Longitudinal data can also help clarify causal pathways between sustainability reporting, leadership factors, and firm value.

Advancements in technology offer additional opportunities for future research. Artificial intelligence, big data analytics, and blockchain systems may be integrated into sustainability reporting processes, improving accuracy, reducing information asymmetry, and strengthening verification. Researchers may explore how these technologies influence reporting quality and investor responses.

Future studies could also expand the conceptualization of leadership competencies by including behavioural attributes, decision making tendencies, ethical orientation, and sustainability literacy. Qualitative interviews with chief executive officers, board members, or sustainability officers may enrich understanding of how leadership shapes sustainability integration within firms.

Comparative studies across countries or regions may offer further insights into how cultural norms, institutional frameworks, and governance structures influence sustainability reporting practices. Such comparisons can help determine the extent to which findings from Malaysia are applicable to other jurisdictions.

Finally, small and medium sized enterprises represent another promising area for investigation. These firms often face resource constraints that limit their ability to implement comprehensive sustainability reporting. Future studies can explore targeted mechanisms to support these firms through training programs, simplified reporting frameworks, and financial incentives.

By exploring these directions, future research can extend the understanding of how sustainability reporting interacts with leadership competencies and industry structures, offering a richer theoretical and practical foundation for corporate sustainability in dynamic business environments.

6.8.1 Recommendations for Academicians

Future research should explore the intersection of sustainability reporting, organisational behaviour, and economic performance to deepen the understanding of sustainability dynamics. Interdisciplinary studies can uncover how psychological, cultural, and economic factors influence corporate decision-making and stakeholder perceptions. Additionally, research should focus on industry-specific sustainability reporting frameworks to ensure their practicality and relevance for businesses across different sectors.

Emerging technologies such as artificial intelligence, blockchain, and big data analytics offer promising avenues for improving sustainability reporting efficiency and reliability. Examining AI's potential to predict the long-term financial impacts of sustainability initiatives could provide firms with data-driven insights for better decision-making. Qualitative research exploring stakeholder perspectives will also yield valuable insights into how various groups perceive and respond to sustainability efforts, helping firms refine their reporting strategies. Comparative studies across regions and industries can highlight best practices and reveal unique challenges, guiding policymakers in adapting global sustainability frameworks to local contexts.

Further investigation into the behavioural dimensions of leadership and their influence on sustainability outcomes is warranted. Research should examine how ethical leadership, decision-making styles, and leadership diversity impact sustainability initiatives. Understanding these behavioural factors will contribute to the development of leadership training programs that support corporate sustainability objectives.

Building upon the findings of this study, future research should examine sustainability reporting and firm value in emerging markets and across different economic and cultural contexts. A longitudinal approach would provide deeper insights into the long-term effects of sustainability reporting and leadership competencies on firm value. Additional moderating variables, such as corporate culture, technological innovation, and organisational structure, should be explored to gain a more comprehensive understanding of sustainability reporting outcomes.

Future research should explicitly address the limitation arising from the aggregation of firms across all sectors in the present study. While the current analysis provides overall evidence on the relationship between sustainability reporting and firm value, industry-specific differences may influence the relevance, materiality, and effectiveness of sustainability reporting. The sustainability priorities and regulatory pressures faced by firms in energy-intensive industries are likely to differ substantially from those in financial services or technology-driven sectors. Accordingly, future studies are encouraged to conduct sectoral analyses by grouping firms into distinct industries such as energy, financial services, consumer products, construction, and technology. Such an approach would allow for more detailed and practically meaningful insights into how sustainability reporting and leadership competencies operate within different industrial contexts. In addition, examining the role of digital transformation within each sector, including the application of artificial intelligence and big data analytics in sustainability reporting, may further enhance understanding of how technological capabilities shape reporting quality and firm value outcomes across industries.

Behavioural factors such as leadership styles, employee engagement, and consumer perceptions should also be examined further to understand their impact on sustainability practices. Investigating the adoption and effectiveness of global sustainability standards, such as those established by the International Sustainability Standards Board, will provide valuable insights into their role in promoting consistent and comparable reporting practices.

Lastly, future studies should focus on integrating sustainability metrics with traditional financial performance indicators to present a holistic view of organisational success. Evaluating the impact of policy interventions and regulatory frameworks on corporate sustainability will offer critical insights into how governmental and industry regulations drive corporate accountability. This research reinforces the importance of

sustainability reporting and leadership competencies in enhancing firm value, offering a roadmap for firms in Malaysia and beyond to embed sustainability into their corporate strategies. A continued emphasis on leadership development and transparent sustainability practices remains vital for long-term corporate growth and societal impact.

6.9 Overall Conclusion to the Study

This study provides a comprehensive examination of the relationship between sustainability reporting, firm value, and leadership competencies among Malaysian public listed companies. The findings confirm that sustainability reporting plays an important role in shaping firm value, particularly when economic, environmental, and social dimensions are disclosed in a transparent and structured manner. Leadership competencies further strengthen the influence of sustainability reporting, although the degree of moderating impact varies across leadership attributes. By integrating sustainability practices with governance structures and organisational leadership, firms are better positioned to meet stakeholder expectations, strengthen market performance, and promote long-term corporate resilience.

The findings reinforce the theoretical premise of Stakeholder Theory, which posits that firm value is influenced by how effectively organisations address the information needs and expectations of diverse stakeholder groups. Sustainability reporting serves as a critical communication mechanism that reduces information asymmetry, strengthens stakeholder confidence, and signals long-term strategic commitment. Leadership competencies play a key role in this process by shaping how sustainability initiatives are prioritised, communicated, and embedded within organisational strategies. However, the variation in moderating effects observed across leadership attributes suggests that stakeholder-driven valuation outcomes are influenced not only by individual leadership characteristics but also by broader governance arrangements and institutional contexts.

Overall, the study demonstrates that the relationship between sustainability reporting and firm value must be interpreted within a wider stakeholder-oriented framework. While sustainability reporting consistently enhances firm value, leadership competencies contribute to this relationship primarily when they support effective stakeholder engagement and alignment. These findings highlight the importance of

viewing sustainability reporting and leadership not as isolated drivers of firm value, but as interconnected mechanisms through which firms manage stakeholder relationships and sustain long-term value creation in the Malaysian corporate landscape.

A key methodological consideration is the modest explanatory power of the statistical models. The R squared values ranging between 3.8% and 5.2 % indicate that sustainability reporting and leadership variables explain only a portion of firm value variation. This result is consistent with market-based models that measure firm value because financial markets are influenced by multiple external and internal factors such as economic conditions, investor sentiment, competitive behaviour, and regulatory expectations. The acknowledgement of this modest explanatory power allows for a more realistic interpretation of the statistical outcomes and provides clarity regarding the inherent limitations of valuation models.

The inconsistency in the significance of several moderating variables highlights the complexity of leadership influence on sustainability outcomes. Leadership characteristics such as age, tenure, and experience do not consistently strengthen the sustainability reporting and firm value relationship. These findings indicate that demographic indicators may not fully capture the behavioural, cognitive, and strategic elements of leadership that contribute to sustainability governance. Structural factors such as organisational size, institutional pressures, and distributed decision-making authority may also influence these results, suggesting the need for deeper theoretical perspectives to explain the variation in leadership effects.

The analysis period also covered the pre-pandemic, pandemic, and post-pandemic phases of COVID-19. While the pandemic introduced considerable economic uncertainty, comparative evaluation across these periods shows that sustainability reporting retained its relevance as a determinant of firm value. The stability of results across these phases provides additional assurance regarding the robustness and reliability of the findings.

The significance of the study can be categorised into contributions to knowledge, contributions to practice, and contributions to research methodology. Theoretical contributions include the integration of multiple theoretical perspectives to explain the influence of sustainability reporting and leadership on firm value. Practical contributions highlight the importance of transparent sustainability reporting and strong leadership in enhancing market confidence and long-term organisational success. Methodological contributions include the adaptation of the Ohlson valuation model to

incorporate sustainability indicators and leadership variables, supported by robust diagnostic testing and empirical validation.

In conclusion, the findings of this study demonstrate that sustainability reporting is a valuable strategic instrument that enhances firm value, strengthens stakeholder relationships, and reinforces organisational legitimacy. Leadership competencies further support this relationship by aligning sustainability practices with strategic decision-making and corporate governance. Firms that cultivate leadership competencies, prioritise transparent reporting, and embed sustainability into corporate strategy are better positioned for long-term resilience and competitive advantage in a rapidly evolving business environment. The insights generated from this research therefore offer a meaningful foundation for policymakers, investors, and corporate leaders seeking to advance sustainable corporate practices in Malaysia and beyond.

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APPENDICES

APPENDIX A

Table of Determining Sample Size for a Finite Population and Formula of Determining Sample Size

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382

Formula for determining sample size

$$s = X^2NP(1-P) \div d^2(N-1) + X^2P(1-P)$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05).

Source: Krejcie & Morgan, 1970

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Hod bin Amin obtained Bachelor of Accountancy (Hons) in 1994 from Universiti Pertanian Malaysia, Master of Accountancy (2020) from Universiti Kebangsaan Malaysia.

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