



Concept Paper Developing a Green Governance Framework for the Performance Enhancement of the Oil and Gas Industry

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Abstract: Green governance is an emerging concept that has received considerable attention from academics and industry over the last decade. Nevertheless, limited evidence is available on how green governance can affect the overall performance of firms. Accordingly, the study develops a green governance framework and establishes its relationship with the firm performance measured through shareholder value-added. While developing a new framework, this study integrated enterprise risk management, sustainability indicators, and green board committees to provide a holistic view of green governance. A contentious examination of the extant literature indicates the efficacy of these factors in mitigating economic, social, environmental, and governance risks. Firms, coping with these risks through the execution of a green governance framework, ensure shareholders' interest by enhancing their financial returns and stakeholders through promoting sustainability. The study provides theoretical and practical insights to the policymakers, regulators, and practitioners of the oil and gas industry in promoting sustainable and cleaner operations by executing a green governance framework. To the best of the authors' knowledge, this is the first study to propose an integrated green governance framework for the performance enhancement of oil and gas companies.

Keywords: sustainable development goals (SDGs); enterprise risk management (ERM); sustainability practices; shareholder value; environmental management; green performance

1. Introduction

Human civilization has experienced three phases of society such as primitive society, agricultural society, and industrial society [1]. In each phase of society, humans are closely related to nature. With the revolution of industry 4.0 in the 21st century, human activities have been exposed to having detrimental effects on the environment and society [2,3]. For instance, the notable spillover of British Petroleum led to severe environmental, economic, and social losses [4]. On the contrary, the world also witnessed a rise in plan actions to tackle the threat of sustainability-related challenges [5]. Currently, one of the best examples is the introduction of the United Nation's Sustainable Development Goals, which is considered the most dominant plan of action for tackling economic, environmental, and social issues [6]. The United Nation's sustainable development goals advocate for strong participation from the public and private sectors, furthering the pressure from various stakeholders to promote sustainability [7]. Consequently, the majority of the corporations satisfy different stakeholder groups by endorsing clean and green practices. To encourage such practices, firms tend to strengthen their corporate governance structures because it is considered one of the dominant mechanisms in aligning the interests of all stakeholders and drives firms towards sustainability [5]. To date, several corporate governance frameworks have been developed to enhance a firm's performance, but limited attention has been given to the concept of green governance in promoting firm performance.

Green governance is an emerging concept that incorporates the notion of sustainability due to which organizations remain accountable for the long-term economic, social, and



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Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). environmental effects. This, in turn, fulfills internal stakeholders' needs through high financial returns, while the external stakeholders are satisfied by protecting the society and environment. Consequently, embedding the idea of sustainability into the governance framework will help mitigate ESG risks and shape the firm's overall performance. In this esteem, the presence of green board committees in the governance framework will ensure the efficient implementation of sustainability practices. Besides, enterprise risk management is another dominant tool, which is executed to detect certain risks affecting the economic, social, and environmental practices while preserving the community and environment [8]. The implementation of risk management ensures a coordinated and integrated response to various risks that may tarnish the firm's reputation and financial performance [9]. Pertaining to the aforementioned discussion, the incorporation of sustainability and enterprise risk management in a green governance framework will provide a diversified value creation mechanism for corporations, particularly for the oil and gas industry.

Prior research shows that the oil and gas industry is vulnerable to various types of risks [10]; therefore, executing a green governance framework becomes essential. Any mishap due to lack of green governance would lead to financial loss vis-a-vis social and environmental catastrophes. For instance, the Deepwater Horizon incident in the Gulf of Mexico led to a financial loss of USD 20 billion, 11 deaths, and several injuries, and it affected over 16,000 miles of coastline [4]. Similarly, the Malaysian National Oil Company Petroleum Nasional Berhad (PETRONAS) had borne a loss of USD 800 million (RM 2.4 billion) due to the pullback from investment in an ambitious project in Canada for social and environmental incompliance [11]. In a recent scandal in Pakistan, the Hascol company faced a financial loss of Rs 8 billion [12] due to the absence of a rigorous governance framework. The oil and gas industry is among the most emissions-intensive with the production and use of oil and gas accounting for over half of global greenhouse gas emissions associated with energy consumption [10]. Additionally, the risks associated with this industry are ahead of economic risks such as ecological, social, and governance risks that impede a region's social environment and ecological environment. Thus, it affects the sustainability of the oil and gas industry and consequently the global sustainable development agenda. Accordingly, the study aimed to develop a green governance framework for the oil and gas industry to mitigate various risks related to sustainability and might provide basic provisions to the concept of sustainable development. In parallel to the oil and gas industry, other sectors might also be exposed to non-financial and financial losses due to a lack of governance practices. Hence, the execution of a green governance framework is crucial for every sector because it provides a cushion to society, the economy, and the environment.

In the green governance literature, different notions have been investigated, such as governance composition [13], green innovation [14], comprehensive green innovation [15], an environmental management system [16], green board committees [17], board characteristics [18], open innovation [19], environmental regulation [20], and the nexus of green governance with financial constraint [21]. The literature lacks a holistic view of a green governance framework that covers the board room's environment; management of ecological, social, and governance-related risks; and the organization's proactive approach towards sustainable development. Nevertheless, a lack of green governance can lead to environmental, social, and economic losses, further paving the way to jeopardizing sustainable development. This research intends to develop a green governance framework to overcome emerging issues in line with the gap highlighted in the literature and associated problems. Accordingly, this study sets the following objectives to address the key issues and fill the current information gap. The study's first objective was: To develop a green governance framework with the inclusion of enterprise risk management, social-environmental sustainability practices, and green board committees for Malaysia's oil and gas industry. The literature indicates that sustainability practices significantly improve a firm's performance and bestow an enterprise with a competitive advantage. This study combines sustainability practices, green board committees, and enterprise risk management practices to investigate their role in the performance enhancement of Malaysian oil and gas companies. The second

objective of the study is: to explain the connection between aspects of green governance and firm performance. The achievement of these objectives would highlight the critical function of green governance in fostering sustainability and the financial performance of the oil and gas industry. The completion of this study will provide valuable insights to firms in becoming proactive in their operations, which will bestow the firms with a competitive advantage and drive them towards sustainable development.

The current study is distinguished from others and contributes to the body of literature in several aspects of green governance practices. First, this study presents a novel contribution by proposing a holistic view of the green governance framework, which incorporates the board room environment, enterprise risk management, and sustainability practices. Past research has focused on solo-based green governance in terms of its dimensions and framework. Second, an interesting contribution of the study is the development of the methodological framework for the computation of environmental, social, and governance risks by using the guidelines and dimensions provided by (COSO and WBCSD 2018). Finally, this study provides vital insights to policymakers of the oil and gas industry to execute the proposed green governance framework in their strategies and policies to enhance firm performance and deal with global sustainability challenges.

The remaining part of the study has proceeded in the following sections. Section 2 briefly reviews prior literature, discusses the theoretical framework, presents the conceptual framework, and develops the proposition. Section 3 presents the research methodology. Discussion, theoretical implications, practical implications, and policy recommendations are explained in Section 4, and finally, Section 5 concludes this article along with the limitation and future directions.

2. Literature Review

This section starts with the discussions on the green governance framework and its associated variables, followed by the theoretical background, the conceptual framework of the study, and the development of research propositions.

2.1. Green Governance

It is axiomatic that green governance plays a pivotal role in the sustainable development of firms [17]. Despite its high importance and being a global concern subject, little attention has been paid to the concept by academics. Since the blasting of sustainable development goals, it is becoming an emerging research area [19].

Digging the notion of "green", it is a rhetorical word that has evolved from the concept of colors and transitioned into a development concept of "green plus", for example, green economy, green governance, and green finance [22]. Searching for the term "green" in various dictionaries, the authors did find that it is a color of life, which carries multiple meanings such as growth, renewal, harmony, hope, peace, and safety. It is a symbol associated with the organizations' prosperity, freshness, and progress. The recent Malaysian Code of Corporate Governance (MCCG) issued on 28 April 2021 highlights the essence of green governance in a firm. It clarifies that the boards should take a holistic view of business and proactive and effective measures to address environmental, social, and governance (ESG) issues and opportunities [23]. Moreover, the concept of green governance is much clarified in the 12th Malaysian plan of making a country "*prosperous, inclusive, and sustainable.*"

Green governance is a vast concept; therefore, researchers have not agreed on a single definition that covers all the aspects of green governance. For instance, Dieng and Pesqueux [24] described the concept of green governance as enterprise actions that reduce sustainability issues and become a base of sustainable development. Post et al. [13] declared economic, social, and environmental sustainability practices as green governance. Similarly, Lin et al. [20] incorporated the concept of sustainability under the term green governance. According to Li et al. [19], green governance is the organizations' actions that mitigate the conflict between humans and nature. Kuo et al. [25] stated that green governance

is a life cycle that assists companies in driving towards sustainable development. Thus, it can be argued that *green governance is an umbrella term that is comprised of corporations' practices overlapping with the conceptions of business–governance, business–environment, and business–society relations for the good of wider stakeholders.*

In today's interconnected world, stakeholders have realized the importance of green governance in attaining a firm's performance and sustainability. Various aspects of green governance have been investigated by previous studies (see Table 1). Prior research pointed out that broad stakeholder groups are pressurizing corporations to ensure their adherence to green governance to cope with the 3 Ps, i.e., profit, people, and the planet. Moreover, the theory of accountability also supports the notion of the triple bottom line to reflect the firm's responsibility towards stakeholders [26]. Accordingly, companies need to incorporate various economic and value-based tools into green governance to ease its way towards sustainable development [25]. This study attempts to develop a green governance framework by integrating three intriguing aspects: green board committees, enterprise risk management, and sustainability practices to give a holistic view. Each of the above three aspects is briefly explained in the subsequent sections.

Table 1. Review of literature on green governance.

Reference	Explanatory Variables	Dependent Variable	Methodology	Theory	Country/Region
Shah et al. [17]	Green board committees	Shareholder value-added	Content analysis	Agency and stakeholder theory	Malaysia
Li et al. [21]	Green governance structure, ownership characteristics	Financial constraints	Content analysis	Signaling theory	China
Li et al. [22]	Family ownership	Green governance	Content analysis	Theory of social-emotional wealth	China
Shad et al. [27]	Sustainability practices	Cost of capital	Content analysis	Signaling theory	Malaysia
Abdul Manab et al. [8]	Corporate governance compliance, sustainable risk management	Firm survival	Questionnaire survey-structural equation model	Risk management and compliance theory	Malaysia
Shad et al. [28]	Enterprise risk management, sustainability practices	Economic value added	Content analysis	Modern portfolio and stakeholder theory	Malaysia
Lin et al. [20]	Environmental regulations, foreign direct investment policies	Business strategies	Content analysis	Resource-based view theory	China
Mahmood and Orazalin [18]	Board independence, the board size, board committees, board diversity	Sustainability reporting	Content analysis	Stakeholder and resource dependency theory	Kazakhstan
Shahbaz et al. [29]	Board independence, CSR committee, gender diversity, board diligence	CSR Performance, Tobin's Q, Return of assets	Content and ratio analysis	Agency and stakeholder theory	Global energy sector
Li et al. [19]	Open innovation	Sustainability performance	Qualitative techniques	Innovation, governance, and resource scarcity theory.	China
Ahmad and Abdullah [30]	A green governance accountability system	Sustainability performance	Qualitative techniques	Accountability theory	Malaysia
Kuo et al. [25]	Environmental management, green innovation, greenhouse, and carbon emission	Climate change	Coding and content analysis	Signaling and stakeholder theory	China
Khan et al. [14]	ISO 56002-2019, green innovation	Sustainable development	Content analysis	Disclosure, legitimacy, institutional and stakeholder theory	Malaysia
Toha et al. [16]	Eco-innovation	Social performance	Content analysis	Resource-based view theory	Malaysia

2.1.1. Enterprise Risk Management

The Global Risk Report (2021) recently published by the World Economic Forum linked the top risks to the environment and society that may affect any business [31]. The report further elaborates the interconnections between non-financial and financial risks, which hinder the firm performance. It is also indicated that risks related to the environment and society are highly expected to damage the economies in the next ten years. Consequently, the execution of enterprise risk management becomes of utmost importance for corporate boards to mitigate the environmental, social, and governance (ESG) risks. As such, the company's engagement in business activities may expose it to the myriad of ESG-related risks [28]. Failure to manage the risks would have dramatic ramifications on firms' profitability [32–36]. With its far-reaching impacts on the firm's operations, the adoption of enterprise risk management (ERM) is crucial to cope with any emerging risks.

ERM is an organizational tool that assists firms in formulating effective and sustainable business strategies [37]. In a similar vein, Abdul Manab et al. [8] described ERM as a process of detecting risks and preserving communities and the environment. It is anticipated that ERM identifies, analyses, and evaluates the projected and unprojected risks associated with business operations [38]. Implementation of ERM gives a coordinated and integrated response to ESG risks that tarnish an organization's reputation and financial performance [9]. To date, distinct ERM frameworks have been developed by international organizations that enterprises frequently adopt to deal with emerging risks. Some of the eminent ERM frameworks are shown in Table 2. COSO's ERM framework is considered the most widespread framework employed by organizations for risk management (Saltz and Lahiri 2020). Prior literature indicates that implementing the COSO ERM framework improves firm performance by reducing the cost of capital and earnings volatility and enhancing company efficiency [39]. According to Abdul Manab et al. [8], ERM is an integral part of corporate governance, which mitigates internal risks along with external and reputational risks. It assists corporate executives in preventing firms from any uncertainties and generates a high firm value [40]. It can be argued that integrating ERM into corporate strategies will enhance the financial returns by minimizing operational costs. As this study focuses on developing a holistic green governance framework, the incorporation of ERM is the most appropriate tool for mitigating the ESG risk and a wide range of emerging risks.

S. No	Enterprise Risk Management Frameworks	Sustainability Frameworks
1	ISO31000: 2009–2018 Risk Management-Principles and Guidelines on Implementation of Enterprise Risk Management	Global Reporting Initiative (GRI)
2	Federation of European Risk Management Associations (FERMA). A Risk Management Standard	Task Force on Climate-related Financial Disclosures (TCFD)
3	COSO 2004: Enterprise Risk Management Integrated Framework	Sustainability Accounting Standards Board (SASB)
4	COSO 2018: Enterprise Risk Management for Environmental-, Social-, and Governance-related Risks.	Global Real Estate Sustainability Benchmark (GRESB)
5	RMM—Risk Maturity Model	Dow Jones Sustainability Indexes (DJSI)
6	AS/NZS 4360 (2009)	The Framework for Policy Coherence for Sustainable Development (OECD-PCSD)
7	ISO 31000: 2018	ISO 26000

Table 2. Renowned ERM and Sustainability Frameworks.

2.1.2. Sustainability Practices

Kantabutra and Ketprapakorn [26] define sustainability as "the leadership and management approach that a corporation adopts so that it can profitably grow and at the same time deliver social, environmental and economic outputs." Based on this definition, they presented corporate sustainability theory. Business activities' influence on society and the environment makes sustainability vital for various organizations. Therefore, organizations are directed to adopt a business model that focuses on financial, social, and environmental goals. To achieve sustainability, organizations need to implement social and environment-friendly policies [28]. Enterprises are suggested to adopt social and environmental sustainability practices (SESP) to minimize the business's negative impacts on the environment and society. Sustainability investment raises moral capital, resulting in various forms of relational capital among wider stakeholders [41]. Such investment further mitigates multiple risks such as reputation, investor recognition, the uncertainty of future cash flows, and therefore the firm's overall risk [41]. Several sustainability frameworks have been developed to promote SDGs. Some of the frequently adopted sustainability frameworks are conferred in Table 2.

Sustainable development is based on three main layers, i.e., economic, social, and environmental practices [18]. Corporations implement the SESP for the welfare of the natural environment, employees, citizens, and society. The execution of these two aspects in the business strategies provides a competitive advantage [42]. Organizations implement SESP to diffuse the stakeholder's pressures and ease their way towards sustainable development. SESP has become an integral tool for investors because it inevitably contributes to shareholders' value and drives its value creation process. The disclosure of reports on SESP reflects the firm's accountability to various stakeholders, which builds a good reputation and improves the firm's performance [43]. The pursuit of sustainability practices is to bring transparency to the company's operations and create stakeholder's value by fostering social growth and respecting the environment. Firms tend to adopt environmental sustainability practices to improve the quality of the environment by mitigating the risk of global warming, climate change, pollution, and depletion of natural resources that have a detrimental impact on the ecosystem. In the same way, a firm's social sustainability practices enhance social systems like labor practices, charity, employment opportunities, human rights, and its relationship with communities in which they operate [44]. According to Qiu et al. [45], SESP improves firm performance by reducing regulatory and reputational costs. Similarly, Clarkson et al. [46] support the integration of proactive environmental practices in the business strategy to get financial benefits. Likewise, Velte [47] encourages the adoption of pro-active SESP to get higher financial performance. Hence, the study considers SESP a dimension of the integrated green governance framework.

2.1.3. Green Board Committees

Corporate board committees (GBC) have been acknowledged as a predominant governance tool that supports board room decision-making and enhances corporate performance. A change in the perception of risks has motivated organizations to establish specific board committees that could cope with emerging issues of sustainability and ethics. The growing pressure from stakeholders also paves the way for forming such a committee that could manage and oversee the demands of stakeholders [48]. The formation of GBC becomes pivotal for organizations since the green board committee assists the board of directors in functions and decisions regarding the firm's sustainability. GBC has been indicated with distinct titles or names, but its function and aims are the same, embedding sustainability across the firm [49]. It is argued that GBC ensures the firm's sustainability by performing four vital roles: oversight of management, strategy making, sustainability reporting, and risk management function [17].

Prior research has observed a significant growing presence of GBC in organizations [50]. Being an integral part of governance, GBC contributes to the firm's vision and strategy and improves its transparency and accountability. Its appearance onboard signals to stakeholders that the firm is curious about environmental, societal, and governance issues. GBC reports the board of directors periodically regarding sustainability risks [51]. GBC is also responsible for disclosing social and environmental performance to stakeholders [52]. The authors believe that GBC engagement in sustainability practices might assist firms in pursuing SDGs very closely. Its scrupulous attention would improve the management of social and ecological issues [29]. GBC not only increases a firm's awareness of how social and ecological risks are impacting its competitive advantage but also executes action plans to overcome those risks [17]. Its existence signifies a reputational role on emerging issues at the top-level [53]. It presents the real commitment of the board to better firm performance [54] (Shaukat et al., 2016). Its role in maintaining a firm's sustainability is inevitable. Besides, Biswas et al. quote that the "sustainability committee assists the board with overseeing strategies designed to manage social and environmental risks, overseeing management processes and standards and achieving compliance with social and environmental responsibilities and commitments" [52] (p. 7). Such engagement perhaps alleviates the risks and improves firm performance. Therefore, GBC as a vital governance attribute is incorporated in the green governance framework. Its inclusion would strengthen the governance framework and assist firms in achieving sustainability.

2.2. Conceptualisation of Firm Performance

Business performance is widely investigated in management research and is more often used as a dependent variable. Given that continuous business performance in the contemporary world is the companies' main objective, such performance is computed using different techniques. In this regard, Wach et al. [55] encourage using various performance techniques to overcome the flow of wrong information. The measurement of business performance conveys significant information to top management on an enterprise's value creation.

Firm performance can be financial or non-financial [7,56]. The proxies representing financial performance include return on sales, return on assets, return of equity, return on invested capital, net sales, net operating profit, earning per share, sales, market share, economic value-added, and shareholder value-added. Non-financial proxies comprise green growth, a company's reputation, customer satisfaction, product-service quality, and customer retention, among others. This study focuses on the financial performance of firms. Given that most of the financial and accounting measures are criticized by researchers because of giving misleading information to investors and managers on a company's progress and innovation [57]. However, based on the economic theories, shareholder valueadded (SVA) as financial performance has highly drawn the attention of researchers and industry practitioners [58]. Fernandez [59] has also supported SVA as business performance. This study proposes SVA as a business performance indicator for Malaysian oil and gas companies. Alfred Rappaport developed SVA in 1986 [60]. It is defined as the excess amount of income that the firms earn after deducting funding costs. The rationale of using this measure is its reflection of deducting the weighted average cost of capital from the operation efficiency of firms. Largani et al. [58] measured SVA as follows:

$$SVA = NOPAT - WACC$$
 (1)

where SVA represents the shareholder value-added, NOPAT is the operational efficiency, net operating profit after tax. The WACC is the weighted average cost of capital that includes the cost of debt and the cost of equity.

2.3. Theoretical Framework

This study adopted the postulations of signaling and stakeholder theories to develop a green governance framework, which is discussed below.

Green Governance and Firm Performance: Signaling Theory and Stakeholder Theory

The signaling theory has been extensively applied by prior studies in assessing the effect of green governance on a firm's performance. The notion of signaling theory was proposed by Nobel laureate Andrew Michael Spence, in 1973, for the assessment of knowledge gaps between organizations and potential employees [61]. The theory was formulated for the job-market signaling model, but its instinctive nature was adopted in other areas, too, such as management and financial markets [62]. This theory is based on the information

asymmetry between the firms' agents and a wide group of stakeholders because agents usually have more information about the company. Generally, it focuses on disclosing a company's information to investors. It depends on agents to, whether or not, provide the firms' information to stakeholders to mitigate the information gap. The disclosure of information regarding the firms' operations satisfies various stakeholders and the business' impact on society and the environment is handled responsibly. Similarly, Kantabutra and Ketprapakorn [26] advocate that the firms show their accountability to wider stakeholders via reporting the company's information. In this regard, the execution of green governance practices would improve the firm's reputation by reducing the information asymmetry between firms and stakeholder groups. In this viewpoint, the current study adopts the perspective of signaling theory to support the development of a green governance framework. While developing the framework, this study incorporated green board committees, enterprise risk management, and social and environmental sustainability practices to signal that the business's impact on society and the environment is handled responsibly.

The presence of GBC in the framework would strengthen the top tone by rigorous monitoring of management to improve the transparency in the firm's operations. Its appearance might satisfy stakeholders regarding the ignorance of society and the environment by the management. Implementation of ERM practices would encourage the stakeholders and investors that the firm has mitigation plans and operational capacity to tackle the ESG issues. ERM disclosure is essential for decision-making [63] and beneficial for investors since it carries out risk analysis for a firm's profitability [64]. The adoption of SESP would educate the concerned stakeholders on the organization's efforts for the welfare of society and the environment. Its early dissemination by the organization is crucial because it reduces the cost of capital, and a firm gains high profit when its cost of capital is low. The disclosure of information about the company activates to increase the stakeholders' trust, which increases the firm's financial performance [65]. Santis et al. [66] argue that business models can no longer rely just on the traditional bottom line (profitability) but also on the modern bottom lines (society and natural environment), which ensure the stakeholders' concern.

Stakeholder theory is another vital justification for corporations to provide information on sustainability. Stakeholder theory states that corporations' fundamental purpose is to create and maximize stakeholders' value [67]. The essence of stakeholder theory is that the stakeholders are often seen as an asset of an organization, and the management must please them. All stakeholders expect the corporations, even if they cannot directly play a positive role in the corporation's existence, to disclose their actions and obtain information on how organizational activities will impact them. Multiple stakeholders' satisfaction enhances a corporate's goodwill. Corporations can retain their position and reputation in society, eventually enhancing their worth. The execution of a green governance framework determines that the organizations fulfill their contractual obligation and that the actions correspond to economic, social, and environmental value systems. In stakeholder theory, it is established that implementing a green governance framework ensures various stakeholders that the business impact on the society, environment, and economy is handled responsibly. This, in effect, will enhance the performance and economic value of the companies.

2.4. Conceptual Framework

The conceptual framework is the graphical representation of the supposed relationship between variables to be studied. The acceleration of social, environmental, and governance issues highlights the essence of a holistic green governance framework. Green governance has become an essential mechanism in achieving the SDGs. Literature shows that the role of green governance in enhancing firm performance is the least investigated area of research, which calls for the development of new frameworks to promote green practices. Besides, the oil and gas industry needs to contribute to the global sustainability programs by developing a green governance framework to mitigate the ESG risk. This study intended to produce a green governance framework by blending governance and management aspects to better deal with emerging sustainability issues. The framework is formulated to visualize its associations with firm performance. The proposed research framework is based on two types of variables: the dependent variable and the explanatory variables. The dependent variable is the firms' financial performance proxied by shareholder valueadded. Green governance is accounted as the explanatory variable, which is further split into three aspects: green board committees, enterprise risk management, and social and environmental sustainability practices, as shown in Figure 1. In the above theoretical framework, the study assumed that green governance might positively influence firm performance. An empirical investigation of the proposed green governance framework would cement the belief and increase understanding of how green governance affects firm performance.





2.5. Development of Propositions

Sustainability is a topical issue around the globe. Organizations face high pressure from various stakeholders to be proactive in coping with emerging issues and be transparent in triple bottom line practices. The consistency of organizations in the ESG operations appease stakeholders and improves the economic growth of a firm. This work developed a green governance framework that may holistically respond to ESG issues and increase the stakeholders' value along with the firms' profit maximization. This study expected a positive relationship between green governance practices and firm performance. Prior studies have demonstrated a positive nexus between the aspects of green governance and firm performance. The documented evidence of the impact of an integrated green governance framework on firms' financial performance is limited. Therefore, the current study extended the theoretical understanding by assuming a positive nexus between green governance aspects and financial performance in the perspective of the aforementioned theories and past empirical research.

2.5.1. Green Board Committees and Firm Performance

The significance of GBCs has increased due to emerging sustainability issues. The presence of such committees in the board room sends signals to stakeholders about the focus of organizations on sustainable development [68]. It is argued that organizations

having GBCs do adopt better sustainability practices and disclose more information as compared to firms without having GBCs [69]. Shahbaz et al. [29] declared GBCs as an internal risk management factor because of their role in alleviating sustainability risks. It is considered a vital governance tool that increases the firms' opportunities for sustainable development [51]

In prior studies, it has been observed that the presence of GBC in the boardroom makes a firm perform brilliantly in managing sustainability and minimizing stakeholders' conflicts. Committees help the board of directors in the company's adherence to the corporate code of conduct, which enhances the performance of firms. In this context, Shahbaz et al. [29] disclosed a positive association between the GBCs and ESG performance. Equally, Chen et al. [70] showed the direct impact of GBCs on green performance and an indirect effect on financial performance. The authors argued that financial performance is a direct result of green performance. Noja et al. [71] concluded a significant impact of GBC on the firm's financial performance. Orazalin [72] revealed that GBC improves social and environmental performance and enhances CSR strategies. In another study, Biswas et al. [52] concluded that GBC enhances the firm's non-financial performance. In contrast, Baalouch et al. [73] explored an insignificant relationship between GBC and firm performance. Based on the above arguments and theoretical underpinning of the aforementioned theories, this study postulates the proposition as:

P1: Green board committees have a significant positive impact on the firm performance measured through shareholder value-added.

2.5.2. Enterprise Risk Management and Firm Performance

Enterprise risk management significantly drives a firm towards sustainable development by overcoming environmental-, social-, and governance-related risks. Avoiding ESG risks can lead an organization to both financial and non-financial losses. This realizes the importance of enterprise risk management, which increases an organization's capacity to cope with ESG related risks and demonstrates good governance, essential to sustainable growth. ERM is a governance mechanism due to its constrain and coordinating function related to managers' behavior [74]. Its implementation signals a strong internal control of the market. ERM more often helps in the identification of risks and opportunities that improve shareholders' value [75]. It contributes to maximizing shareholders' value by reducing the costs arising from market imperfections such as external capital costs [76], taxes [77], and agency costs [78]. The literature review reflects a growing interest among researchers in the relationship between ERM and firm performance. This relationship remains a subject under research due to mix statistical evidence. Some empirical investigations failed in bridging any significant nexus between ERM and firm performance [79]. However, some studies favor that the ERM implementation positively affects business performance [75]. Saeidi et al. [80] identified a positive relationship between ERM and firm performance in a related study. ERM implementation assists in resource allocation, mitigation of operational risks, and development of the internal and external environment, which uplifts profitability [81]. In a similar vein, Lai et al. [82] developed an ERM framework by theorizing the intertwined relationship between ERM and shareholder value-added. They challenged neoclassical finance theory and posited that enterprise risk management improves business performance and reduces the cost of capital. This study incorporates ERM practices in the green governance framework and expects a positive relationship with firm performance and, thereby, proposes that:

P2: Enterprise risk management has a significant positive impact on the firm performance measured through shareholder value-added.

2.5.3. Social and Environmental Sustainability Practices and Firm Performance

Social and environmental sustainability practices have gained popularity and have attracted the attention of researchers due to rapid technology growth, high stakeholder pressures, and globalization. Its implementation is a growing trend among organizations [83]

because firms are urged to adopt such policies that cause no harm to the environment and society [84]. SESP is crucial for enterprises to deal with uncertainties, mitigate future challenges, and comply with regulations [27]. This assists businesses in performing sustainable operations and results in high firm performance [85]. Sustainability is the least investigated area of research [86]. Therefore, it becomes vital to identify its role in influencing the firm performance. In an empirical investigation, Murray et al. [87] found that social and environmental practices are significantly related to market returns. They argued that a higher level of social and environmental sustainability practices results in higher returns. Besides, Qiu et al. [45] revealed a significant positive association between social sustainability practices and profitability but failed to demonstrate a link between environmental sustainability practices and profitability. Bouslah et al. [41] investigated the nexus of social sustainability and firms' risk of non-financial US firms covering the post-crisis and pre-crisis periods. They revealed a significantly different relationship in the pre-crisis period compared to the crisis period. However, Clarkson et al. [46], assessing environmental sustainability practices, evidenced a significant impact of environmental practices on a firm's market value. Similarly, Benlemlih et al. [88] suggest that social and environmental sustainability practices improve firms' reputation and trust with stakeholders and mitigate the operational risk of an enterprise. A study on German firms indicates a significant positive impact of social and environmental sustainability practices on return on assets and Tobin's Q [47]. Breuer et al. [89] found a significant decrease in the cost of equity and argue that it is only possible through the proper implementation of social-environmental sustainability practices. Consistent with the above discussion and theoretical support, this study proposes that:

P3: Social and environmental sustainability practices have a significant positive impact on the firm performance measured through shareholder value-added.

3. Methodology

This section discusses the sampling technique, estimation models, and computation of the variables.

3.1. Sampling and Proposed Estimating Models

This study alludes to a green governance framework for the target population of overall oil and gas (O&G) companies. By employing the census sampling technique, the listed O&G firms on Bursa Malaysia are considered a focused sample of the study because they adhere to the green governance practices. Such a sampling method is assumed because it provides the highest accuracy of information about O&G firms. This study suggests data collection for seven years, i.e., for 2015–2021. This period is essential because of the transitioning of financial risks into environmental and societal risks, as exposed in the global risk report (2021). Besides, the launching of SDGs by the United Nations also paves the way to implement green governance. More information on the elements of the green governance framework might be obtained from the companies' embedded reports. The type of data is panel data because of the blending of cross-section companies into time series. The study suggests ordinary least squares (OLS) regression for the preliminary results. Besides, Hausman [90] test is crucial to choose the appropriateness between fixed effect and random effect models [91,92]. Research shows that data analysis can easily be exposed to various econometric issues [93], such as heteroskedasticity and endogeneity. Therefore, the study recommends two stages of least squares (2SLS) and the generalized system method of moments (GMM) to overcome these issues.

3.2. Measurement of Variables

The current study consists of dependent and independent variables. The dependent variable is the firm performance proxied by shareholder value-added and reflected as SVA. The independent variable is the green governance comprised of three aspects, i.e., green board committee, which is represented by GBC; enterprise risk management (ERM); and

social and environmental sustainability practices that are symbolized by SESP. GBC can be measured using the proposed index of Shah et al. (2021) [17]. SESP can be operationalized using the guidelines and toolkit presented by Bursa Malaysia [94]. A novel contribution in the development of a green governance framework is the introduction of the "ERM measurement index for ESG risks" (See Appendix A, Table A1). To the best of the authors' knowledge, there has been no study on the development of an ERM index specific for ESG risks. This index is designed by using the guidelines and dimensions provided by COSO and WBCSD [9]. The prettiness of this index is that it is validated by the experts of both the industry and academics. One industry and one academic expert from the USA, three industry and two academic experts from Malaysia, and one academic expert from Bangladesh and Pakistan have reviewed and validated the proposed ERM index for ESG risks. This can be used to measure ERM, one of the aspects of the proposed green governance framework. Financial data are suggested to be obtained from the Thomson Reuters DataStream, whereas the non-financial data would be sourced from sustainability reports, annual reports, and companies' websites. This study suggests a weighted content analysis for the collection of sustainability-related data. A weighted content analysis using the dummy codes of 0, 1, 2 is the most appropriate method because its degree of verifying information is higher than the unweighted content analysis [5]. For instance, Hamad et al. [43] suggested the weighted content analysis using three dummies for the data collection on sustainability practices. The subsequent section discusses the study.

4. Discussion

The growing concerns on environmental degradation and societal inequality have drawn the attention of corporations towards the implementation of green governance practices. Past research has disclosed that green governance practices are limited [21]. In parallel, various factors in green governance frameworks are also inadequate [25]. This invites the development of a new green governance framework combined with different mechanisms that positively affect the firm performance. This research intends to develop a new framework by blending green board committees, enterprise risk management, and social and environmental sustainability practices to provide a holistic view of the green governance framework. The adoption of such a green governance framework would satisfy the concerned stakeholders and overcome the emerging sustainability issues that might jeopardize the reputation of organizations and shareholder value.

GBC has been utilized as a green governance indicator, which periodically reports the internal and external issues to the board of directors and assists in a firm's sustainability. GBC monitors the management and provides ample guidance in strategy and policymaking. Additionally, this study incorporated enterprise risk management in the green governance framework due to a hike in ESG risks [9]. ERM integration would increase the capacity of the firm in diminishing the ESG risks. The implementation of ERM provides a complete picture of the company's position in risk-taking, risk appetite, and risk profile. This, in turn, increases the confidence of investors and stakeholders. Moreover, it reduces the cost of capital [81] and increases shareholder value [95]. Following the future directions of Lin et al. [20], social and environmental sustainability practices have been considered as the third main aspect of the proposed green governance framework. It is a stakeholder management tool that significantly mitigates information asymmetry and substantially fosters the firm's financial performance. Nevertheless, it is believed that investment in social and ecological protection practices is resource-consuming, but it also contributes to financial performance when various sources of endogeneity related to the nexus of socialenvironmental sustainability and financial performance are overcome [96]. Consequently, the study integrates the three constructs to develop a holistic green governance framework to mitigate ESG risks and enhance the financial return of the firm.

4.1. Theoretical Implication

The suggested framework would contribute to the current understanding of green governance from the oil and gas industry's point of view. In establishing a new framework for the Malaysian oil and gas companies, this study utilized the concept of signaling and stakeholder theories as a foundation for the framework. The current research claims novelty by introducing the notion of enterprise risk management in the governance framework and combining it with the green board committees and social and environmental sustainability practices within the proposed green governance framework. Further, this study established the connection between green governance and firm performance by establishing the nexus of ERM, SESP, and GBC with the shareholder value-added, using the postulation of the aforementioned theories.

The suggested green governance framework is designed to address the operational and sustainability practices gap to make corporate governance efforts more transparent. The early implementation of green governance will give companies long-term investment possibilities and competitive advantage. Moreover, the implementation of green governance may enhance the company's performance towards sustainable development goals since the research focuses on the improvement of corporate's triple bottom line practices.

4.2. Practical Implication

This research demonstrates that the firms' participation in green governance practices such as the execution of GBC, ERM, and SESP may help firms gain competitive advantages and increase their performance. For example, the suggested integrated green governance framework has considerable practical significance for the oil and gas industry. Integrating sustainability practices, ERM, and green board committees in the governance model addresses the concerns about environment, society, and accountability vis-a-vis compliance with the guidelines from regulatory authorities. This behavior of the organization mitigates the risk of emerging challenges and thereby increases the goodwill of oil and gas companies. This ensures that potential investors and other interested parties do not suffer future environmental fines. Consequently, the financial performance of oil and gas companies will not be influenced, and companies will eventually gain from their capacity to attract reasonable investors. This growing interest in sustainable investment will directly assist economic growth and sustainable development.

4.3. Policy Implications

Given the global sustainability issues such as global warming, increasing poverty, gender inequality, child labor, and economic inequality, several policies have been created and implemented by companies worldwide. This research provides insights to the oil and gas industry policymakers to explore and include the principles of green governance, a new framework for tackling the global sustainability problems. Furthermore, this study aims to bring attention to the structure of the board committees in handling sustainability challenges. The execution of the proposed green governance framework will provide an opportunity for the oil and gas industry to solve environmental, social, and governance-related issues. This would enhance the competitive advantage of oil and gas companies and enable policymakers to realize their aim to alleviate sustainability worries. In addition, this research calls upon the policymakers of Bursa Malaysia and the Security Commission of Malaysia to consider the inclusion of ERM and green board committees into their governance standards. They can contribute to achieving true and robust durability that directly contributes to sustainable development.

5. Conclusions

The purpose of this study was to develop a green governance framework and conceptualize it with the financial performance of the firms. The blended green governance framework is produced by incorporating enterprise risk management for ESG risks, socialenvironmental sustainability practices, and green board committees. This research used signaling and stakeholder theories to establish the nexus of green governance with the firm performance measured through shareholder value-added. Firms focus not only on the financial but also on the non-financial operations, showing various stakeholders that the effect of business on society and the environment is adequately handled. The inclusion of ERM, GBC, and SESP into the green governance framework helps the oil and gas companies in enhancing their efficiency by building long-term relations with stakeholder groups. This, in effect, reduces social costs and environmental hazards and maximizes the financial returns of shareholders and investors. In addition, this study shows the crucial implications of green governance in enhancing the oil and gas industry's overall performance. The establishment of a green governance framework ensures various groups of stakeholders that the firms are obliged to act according to the rigorous constraints imposed by influential institutions. In sum, this research provides an understanding of the function of green governance practices to enhance environmental-compliant activities, reduce the waste of resources, reinforce accountability, and protect the interest of various stakeholders. The proposed framework may benefit financial analysts, regulators, investors, and academics by setting out a new and vital approach to look at the performance of Malaysian oil and gas companies.

Limitations and Future Directions

This research work is susceptible to several limitations that future research might withstand. Firstly, this study establishes the linkage between green governance and firm performance in theory. Secondly, the study just adopted the features of board committees and did not focus on the structure of board mechanisms. Future research can test and identify the suggested conceptual framework empirically. The authors aim to analyze the proposed framework from several aspects to determine the applicability and adequacy of the suggested models in different industries and various countries. Future research can contribute to the proposed model and provide some insight into the impact of green governance on firm performance. The statistical findings will help determine which green governance variable enhances an organization's performance and is most appropriate for sustainable development.

Authors Contribution

S.Q.A.S.: Idea, conceptualization, writing—original draft and review and editing. F.-W.L.: Idea, conceptualization, validation and supervision. M.K.S.: Validation, supervision, writing—review and editing. A.A.J.: Writing—review and editing. All authors have read and agreed to the published version of the manuscript.

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Appendix A

Table A1. Enterprise Risk Management for ESG related Risks.

Dimensions (D)	S. no	Proxy Elements	
	1	A charter of the board for ESG-related risks	
_	2	Board's approval on integrating ESG risks into the organization's mission and vision	
– Governance and Culture	3	Board's training and educational programs on ESG-related risks	
for ESG-Related Risks (D1)	4	Formation of board committee for ESG related risks	
_	5	Communication of board committees on ESG-related risks	
_	6	Knowledge and awareness sessions to management on ESG risks	
_	7	Board's report on ESG-related risks	

 Table A1. Cont.

Dimensions (D)	S. no	Proxy Elements		
	8	The business model for ESG-related risks		
- Strategy and	9	SWOT analysis of ESG-related risks		
Objective-Setting for	10	Mitigation plan for ESG-related risks		
ESG-Related Risks (D2)	11	Organization's risk appetite for ESG-related risks		
-	12	Linking ESG-related risks to shareholder value creation		
		Performance for ESG-Related Risks (D3)		
	13	Identification of CO ₂ emissions risk		
-	14	Identification of product carbon footprint risk		
-	15	Identification of biodiversity risk		
-	16	Identification of water risk		
-	17	Identification of toxic emissions and waste		
-	18	Identification of health and safety risks		
-	19	Identification of reputational risk		
	20	Identification of product quality risk		
Event identification	21	Identification of fraudulent governance risk		
-	22	Identification of compliance risk		
-	23	Identification of litigation risk		
-	24	Identification of credit risk		
-	25	Identification of liquidity risk		
	26	Identification of market risk		
	27	Identification of operational risk		
	28	Identification of data security risks		
	29	Identification of IT risks		
	30	Appropriate assessment of CO ₂ emissions risk		
	31	Appropriate assessment of product carbon footprint risk		
_	32	Appropriate assessment of biodiversity risk		
_	33	Appropriate assessment of water risk		
_	34	Appropriate assessment of toxic emissions and waste		
_	35	Appropriate assessment of health and safety risk		
_	36	Appropriate assessment of reputational risk		
Accessing risk	37	Appropriate assessment of product quality risk		
Assessing lisk	38	Appropriate assessment of fraudulent governance risk		
_	39	Appropriate assessment of compliance risk		
_	40	Appropriate assessment of litigation risk		
_	41	Appropriate assessment of credit risk		
_	42	Appropriate assessment of liquidity risk		
-	43	Appropriate assessment of market risk		
_	44	Appropriate assessment of operational risk		
_	45	Appropriate assessment of data security risks		
	46	Appropriate assessment of IT risks		
	47	Actions to mitigate CO ₂ emissions risk		
-	48	Actions to mitigate product carbon footprint risk		
Implement Risk	49	Actions to mitigate biodiversity risk		
Responses	50	Actions to mitigate water risk		
-	51	Actions to mitigate toxic emissions and waste		
	52	Actions to mitigate health and safety risk		

Dimensions (D)	S. no	Proxy Elements		
	53	Actions to mitigate reputational risk		
-	54	Actions to mitigate product quality risk		
-	55	Actions to mitigate governance fraudulent risk		
	56	Actions to mitigate compliance risk		
	57	Actions to mitigate litigation risk		
	58	Actions to mitigate credit risk		
	59	Actions to mitigate liquidity risk		
	60	Actions to mitigate market risk		
	61	Actions to mitigate operational risk		
	62	Actions to mitigate data security risks		
	63	Actions to mitigate IT risks		
	64	Monitoring changes to the internal and external environment affecting organization's risk profile		
Review and Revision for	65	Revision of strategies related to ESG risks		
ESG-Related Risks (D4)	66	Due diligence of ESG-related risk management process		
-	67	Revision of ERM processes and capabilities to enhance the management of ESG-related risks		
	68	Reporting information on ESG risk to board of directors and management		
Information, Communication, and	69	Communicating ESG risks to shareholders in annual general meeting		
Reporting for ESG-Related	70	Disclosure of ESG-related risks to all stakeholder groups		
K18K8 (D5)	71	Board's approval in annual reports on data of ESG-related risks.		

Table A1. Cont.

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