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Unboxing the Quadruple Bottom Line of Corporate Sustainability: Index Development and Validation

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Abstract

To date, research has focused on the Triple Bottom Line (TBL) of corporate sustainability, yet it has paid limited attention to the religious rituals that contribute to sustainability. Accordingly, this research seeks to develop and validate a multidimensional index for measuring corporate sustainability performance. This research introduced the religious aspect and its indicators. Consequently, it integrated it with the TBL of corporate sustainability, which advanced the idea of 'Quadruple Bottom Line' (QBL or 4BL). This research followed the index development procedures suggested by prior research. The study tested the validity and reliability of the measurement index using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The results confirmed four dimensions: economic sustainability, social sustainability, environmental sustainability, and religious sustainability, comprising 31 indicators. Furthermore, the study assessed nomological validity by statistically testing the four dimensions of corporate sustainability. The newly established index may be highly relevant to scholars and practitioners exploring the factors and outcomes of corporate sustainability. This is the first index to make corporate sustainability performance measurable and accessible to concerned stakeholders. This research offers practical implications for policymakers, corporate boards, top management, customers, and relevant authorities in assessing a corporation's contributions to achieving the SDGs. This research will serve as a springboard for developing a multidimensional tool to measure corporate sustainability performance.

1. Introduction

Global efforts aimed at achieving development that is sustainable from environmental, economic, and social perspectives through the formation and execution of corporate sustainability strategies have been intensified in the last several years (Jan, Lai, and Tahir 2021; Adu, Al-Najjar, and Sitthipongpanich 2022; Nguyen et al. 2021; Liute and De Giacomo 2021; Khan, Johl, and Johl 2021; Cancela, Santos, and Coelho 2026). The growing awareness and concerns about environmental degradation, coupled with socio-economic issues, are driving a surge in investigating how corporations develop long-term strategies that address these prevailing global concerns (Emerton and Jones 2019; Alessi, Ossola, and Panzica 2021). This has heightened the debate over the need for an environmental agenda in business strategies. As a consequence, governments and multinational organizations are exhibiting increasing concern by establishing a variety of sustainability measures (Jan et al. 2022a). For instance, the United Nations (UN) has outlined the Sustainable Development Goals (SDGs) as a "Plan of Action" for achieving global sustainability. The extent of achieving sustainability entails strong cooperation and engagement between various actors such as governments, citizens, and corporations (Khan et al. 2022; Faheem et al. 2026).

Corporations play a crucial role in promoting long-term sustainability through contributions across various areas, including job creation, expanding existing ones, growing intellectual capital, and introducing new goods and services (Jan et al. 2022a; Ali et al., 2024; Shah et al., 2026). Corporations may also embrace sustainability by developing a new framework that is financially, ecologically, socially,

and religiously sustainable and, crucially, extendable (van Zanten & van Tulder, 2021). Although the first three are important and well established in corporate sustainability research, little is known about the proposed fourth paradigm, which permits further investigation.

The quest for the fourth paradigm – religiosity – is gaining momentum because the achievement of sustainability requires socially responsible behavior directly influenced by religiosity and spirituality (Agudelo and Cortes-Gómez 2021). By introducing the "religious aspect" and integrating it with environmental, economic, and social aspects, this study established the "Quadruple Bottom Line" (QBL or 4BL) approach to measuring corporate sustainability. Given that religious practices are linked with the ethical behavior of businesses (Callen and Fang 2015) and the business's interest in socially and ecologically responsible policies (Harjoto and Rossi 2019; Jan et al. 2022a). With this viewpoint, the religious aspect of corporate sustainability could be defined as "*meeting the needs of businesses and society's stakeholders without compromising the social norms, moral standards, and ethical behavior of businesses and society's stakeholders".* Social norms refer to the established codes of conduct held by a group and serve as a significant motivator and driving force for individuals (Festre 2010). Individuals are compelled to abandon their selfish interests for the good of the group when they are subjected to the feelings of guilt and shame that come from adhering to established norms (Festre 2010). Observing norms and peers' expectations is linked to support and approval from the community. Social approval or disapproval is seen as a tool that enhances the acquisition of accepted attitudes and acknowledges compliance as a moral obligation (Chantziaras et al. 2020). Ethics in the workplace deals with moral obligations, and ethical behavior confirms codes of conduct and standards (Nguyen et al. 2026). In this view, religious norms matter because they strongly shape individual and business attitudes. Hence, religious norms and their reporting practices should remain central to contemporary business ethics.

Two schools of thought exist on religiosity and spirituality. On the one hand, critics or a wave of modernists believe that religion has become outdated, has no impact, and is expected to disappear in a few decades (Emerson and Hartman 2006). On the other hand, the current practice and impact of religiosity and spirituality have been recognized as a positive predictor of social wellbeing (Villani et al. 2019). Therefore, a question arises: how can we measure and report religiosity in achieving corporate sustainability? To address this, this research aims to introduce religiosity as the fourth dimension of corporate sustainability, leading to the development and validation of a four-dimensional index, the QBL or 4BL.

As specified in Agenda 21, the "Commission on Sustainable Development" commenced developing a set of sustainability indicators to evaluate progress toward sustainability and report the achievements (Spangenberg, 2002). As a result, a group of sample countries worldwide selected and assessed a set of indicators and their measurements for effectiveness and practical relevance. Although the authors do not treat it as a separate fourth dimension of corporate sustainability, they conclude that the religious dimension and associated indicators should be introduced as another pillar of corporate sustainability. Numerous important socio-economic aspects could only be addressed in this manner. Although introducing the religious dimension is a significant contribution in itself, the proposed religious

indicators raise concerns about whether they properly reflect the religious aspect of corporate sustainability. Rather than a purely technical or scientific exercise, indicator development should be an open debate and policymaking process. Indicative indicators appropriate in this sense must be simple and directionally clear: (a) to be *simple*, "the number of indicators must be limited and the method of calculating them transparent;" (b) *directionally clear* means that "they should indicate items and trends obviously relevant in terms of importance for sustainability, and that they are sensitive, i.e., able to signal progress or the absence of it" (Valentin & Spangenberg, 2000).

The second most pressing question is how to use religious sustainability indicators in corporate decision-making. It is difficult to answer this question in detail because the lack of measurement tools hinders the assessment and reporting of religious practices in firms. Accordingly, developing a multidimensional index comprising social, economic, environmental, and religious aspects will strengthen the implementation of religious practices and shed light on their contributions to achieving sustainable development. Thus, this research aims to provide a valid and reliable index that highlights the role of religious aspects and indicators for gauging corporate sustainability performance (CSP).

To confirm religiosity as the fourth dimension, this research extracts distinct indicators/items to measure it. These items are further statistically validated using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Consequently, applying religious sustainability indicators requires strong governance attributes, which may enable the organization to introduce and promote them in business operations. This poses the third important question: does the Shariah board have any impact on the CSP and its unique dimensions such as economic, environmental, social, and religious sustainability? To answer the question and generalize the measurement index, this research achieved nomological validity by collecting and testing the Islamic banking data for a decade spanning from 2011 to 2020.

The current study adds to the body of knowledge in a number of ways. **First**, this research is among the pioneers in conceptualizing the idea of developing a quadruple bottom line (QBL or 4BL) approach by introducing religiosity as the fourth dimension of corporate sustainability. **Second**, this research advances an evolving genre of business research that aims to understand the motivations for executing religious practices. More specifically, this research contributes to existing literature by indicating that religious-based firms play a substantial role in promoting sustainability. In this sense, the study implies the vital role of religious norms in persuading corporate executives to pay more attention to sustainability practices. **Third**, this study enriches existing literature by developing and validating a multidimensional index for measuring corporate sustainability performance. **Fourth**, the study provides novel insights into research and practice about the execution of religious standards to achieve sustainability at the firm level and contributes toward attaining sustainable development. It also provides theoretical, practical, and methodological implications for the regulatory authorities and concerned stakeholders to promote sustainability by implementing the validated quadruple bottom-line approach. **Finally**, this research provides a basis for academics and practitioners to establish a new measurement tool for evaluating corporate sustainability.

The rest of the paper is presented in the given sequence. In Section 2, a brief overview of sustainability has been presented, and religiosity has been conceptualized as the fourth aspect of corporate sustainability. Section 3 carried out detailed stepwise instrument development procedures. Section 4 discusses the overall study and provides theoretical, practical, and policy implications. The limitations of the study and recommendations for future research are also presented in the penultimate section. The last section concludes the paper.

2. Theoretical Background and Concept Development

2.1. Evolution of Sustainability and Sustainable Development

The word sustainable was first used in the context of "eco-development" in a United Nations paper published in 1978 (Johl and Toha 2021; Toha, Johl, and Khan 2020). Nevertheless, its origin is entrenched in earlier notions like carrying capacity/ecological limits, natural resources, biodiversity, and zero or low growth, which were established before the use of the term sustainability or sustainable development (Jan et al. 2022a). The principles of sustainable development and sustainability are somehow interconnected, such as both concepts are often used somewhat interchangeably in the literature (Olawumi and Chan 2018). Several definitions for these concepts make it difficult to accurately interpret the concept (Christen and Schmidt 2012). There had been at least 70 distinct definitions of SD by 1992 (Lozano 2008); by 2007, there were close to 300 definitions of SD and sustainability (Johnston et al. 2007).

Although there have been numerous definitions of sustainability, the most quoted definition comes from the 1987's report of the "World Commission on Environment and Development" (WCED) (Jan et al. 2022b). The seminal book/report of "*Our Common Future*" – known as the Brundtland Commission Report – is a major turning point in the evolution of sustainable development (SD). The report defined SD as "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*" (WCED 1987, 8). In accordance with the Brundtland report, the "International Institute for Sustainable Development" (IISD) defined corporate sustainability as "*business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining, and enhancing the human and natural resources that will be needed in the future*" (Deloitte andTouche 1992), placing greater stress on the environmental aspect. Another benchmark in sustainability was the United Nations Conference for "*Environment and Development*" UNCED (1992) (Khan and Johl 2020), which emphasized social involvement in attaining sustainable development goals (Mebratu 1998). Adding to this, the "World Business Council for Sustainable Development" (WBCSD) derived and combined the UNCED's instructions into the corporate sustainability domain through the perception of "*eco-efficiency*", which primarily focuses on the economic and environmental aspects of sustainability (Nikolaou and Tsalis 2020). Moreover, the "United Nations World Summit on Sustainable Development", held in Johannesburg, took into account the three aspects of sustainability, i.e., the economic, societal, and environmental

aspects (Moldan, Janoušková, and Hák 2012). In the same way, the triple bottom line idea was shifted into the corporate sector and proposed that businesses should consistently attain high economic success, environmental protection, and social equity (Khan and Johl 2019; Elkington 1998). TBL is also referred to as the 3Ps, intended to attain a balance between profit, people, and planet (economic, social, and environmental aspects of CS) in equal harmony (Khan, Johl, and Akhtar 2021; Jan et al. 2021; Shah et al. 2022; Dutta 2025). Furthermore, in 2015, the UN introduced the 2030 Agenda for SD as a "*plan of action for people, planet and prosperity*", and has proposed 17 SDGs consisting of 169 targets as part of the SD agenda (Nations 2015). Its purpose is to outline the steps necessary to achieve sustainable development and to emphasize the contributions of both the public and private sectors in attaining the SDGs (Jan et al. 2022b; Jan et al. 2022a). The adoption of sustainable practices provides solutions for sustainability-related challenges on the firm level, and consequently, contributes to the advancement of the global agenda for SD.

2.2. Conceptualization of Religious Sustainability as the fourth dimension

To comprehend the religious dimension of sustainability, the term "religiosity" must be described. Religiosity is difficult to define, but the notion is broadly about the intensity of adherence to the rules and regulations of religion. The adherence to religious values is linked with guidance that encourages honesty and promotes moral and ethical behavior (Jan et al. 2022a). Hence, religious observance is linked with the ethical behavior of businesses (Callen and Fang 2015) and a surge in the business's interest in socially and ecologically responsible strategies (Angelidis and Ibrahim 2004; Harjoto and Rossi 2019). With this perspective, religious norms are given enormous weight because of their relevance in determining individual and corporate behaviors (Kanagaretnam, Lobo, and Wang 2015). It has been established by prior research that the extent of religious adherence is linked to individuals, businesses, and their decision-making (Lehrer 2004). Religiosity and fundamental declarations, together with the notions that wealth "is instrumental and should serve higher human ends" and the existence of a "relationship of mutual responsibility between human beings and nature," (Melé and Fontrodona 2017) remain central to contemporary business ethics. Influential religions such as Christianity, Buddhism, and Islam have established similar standards, principles, beliefs, and guidelines for actions linked with social and economic perspectives (Chantziaras et al. 2020). In several cases, religious groups have played a major role in acting against and disinvesting in businesses whose actions diverge from the endorsed religious code (Jan et al. 2022a). In this regard, prior research has demonstrated that firms describe and promote themselves as religious-based when they are based in geographical locations with a high religious standard (Chantziaras et al. 2020). For instance, businesses owned and operated under the guiding principles of Christianity in numerous Western countries. Similarly, the Buddhist business network in Malaysia (Chan-Serafin, Brief, and George 2013) and Islamic banks and financial institutions operating in Muslim as well as non-Muslim countries (Jan et al. 2021). Nevertheless, all organized religions intend to promote ethical, social, and moral attitudes and achieve sustainability.

In a sense, organized religions function to promote SD. Thereby, the religious dimension of sustainability has been deployed to advertise the UN's sponsored visions of SD, as well as to advertise the religious sustainability practices of the firms. Religious sustainability is considered a fundamental component of SD that is accomplished through a wide range of social practices (Jan et al. 2022a). The prevailing norms would persuade the executives of religious-based firms to promote sustainability practices. The postulated religious aspect just specifies the themes of Islamic-based practices, but each group (religion) might introduce its own indicators within this multidimensional framework. The Islamic CS practices are likely to be more socially responsible because Islam promotes social justice. The Islamic CSR practices are based on *Falah* (success), which makes them different from their Western counterparts (Dusuki, 2005; Jan et al., 2020). *Falah*, from an Islamic perspective, refers to both worldly success and happiness, such as profit maximization and corporate sustainability, as well as success and happiness in the hereafter (Amran et al., 2017). For instance, one of the Islamic sustainability indicators is the contribution to and administration of *Zakat* ("religious levy"), *Sadaqah* ("charity"), and *Qardh-e-Hassan* ("benevolent loans") funds, etc. (Jan et al. 2021). *Zakat* represents one of the five fundamental tenets of Islam, and the distribution of funds and recipients are outlined in the Qur'an. These are God's laws, and anybody who disobeys them will face eternal punishment (Haniffa & Hudaib, 2007). Nevertheless, *Sadaqah* is a voluntary act that could be used for any cause permitted by Shariah for the betterment of society. Similarly, Islamic corporations can make a significant contribution to society by offering *Qardh-e-Hassan* for socially responsible activities, particularly in the communities where they operate. Other significant indicators of a firm's ethical stance from a religious perspective, such as "Shariah screening during the investment", "allocation of profit based on Shariah", "compliance with Islamic laws for the environment", "Islamic training and education to staff", and "offering scholarships", etc., are the means by which a firm handles its concerned stakeholders, as well as its social and environmental responsibilities. These are essential to form a society that emphasizes moral excellence at its core in Islam, and consequently, contributes to the advancement of the sustainable development agenda.

3. Methods

This research methods section describes how valid and reliable variables were identified in developing the research index (Lučić 2020). The index development and validation involve three study phases with their imperative steps. The first study phase is the conceptualization and construction of the research framework. The second study phase is Index development for measuring corporate sustainability performance, where the first step is to explore items/indicators from the existing literature, the second step is Item purification, and the last step is index dimensionality (Quoquab, Mohammad, and Shahrin 2020). The third study phase is Validation (Quoquab, Mohammad, and Shahrin 2020), which includes the validity and reliability of the corporate sustainability measurement index (Kääriäinen, Mikkonen, and Kyngäs 2020; Wut et al. 2021). During the three-phase study, expert opinions were obtained from three professionals from industry and academia with more than ten years of experience in their relevant fields. The stepwise process followed during the index development and validation is depicted in Fig. 1. The

details about each step in the methodology and literature review are provided in the corresponding sections.

3.1. Study 1: Index development for corporate sustainability measurement

Regarding instrument development for evaluating corporate sustainability, there is a need to develop a strong methodological framework that may be adopted by any organization (e.g., banks and financial institutions). Apart from the methodological approach, it is also important to align firms' compliance with the sustainable development agenda. Therefore, the GRI (2020) reporting standards can serve as the foundation of a sustainability assessment index for businesses when business requirements are considered. Specifically, the GRI is a globally accepted reporting guide that promotes the corporation's triple bottom line aspects and provides a variety of social, economic, and environmental indicators that enable businesses to review and report practices on their CSP (Jan et al. 2022a; Ge, Linnenluecke, and Xue 2026; Gian, Obydenkova, and van der Meer 2025; Setia et al., 2024). Nonetheless, one of the most significant shortcomings of the GRI framework is that it does not take religious beliefs into account while developing its indicators, which are instead focused on the firm's strategic management ideas. Fortunately, this issue can be remedied by including religion-based sustainability indicators in the suggested global reporting standards. The extent of religiosity has a significant impact on business strategies around different parts of the world. Thus, it is expected that the prevailing norms would influence the firm's executives in religiously dense areas to disseminate information about socially responsible actions of firms. As such, most religions endorse businesses to emphasize social and environmental responsibility, which has become central to current discussions on business ethics. Religious sustainability, in this sense, could be the most significant component of sustainable development that is accomplished through different societal practices. The proposed religious dimension only defines themes of Islamic sustainability practices, whereas each community (religion) must introduce its distinct indicators within this multidimensional approach.

The anticipated approach incorporated the adopted Islamic themes with the support of the "Maqasid Al-Shariah theory" of Al-Ghazali. This theory contends that Shariah rules preserve the interests of the public and society in all aspects of life. Accordingly, religious sustainability indicators could be important for ensuring social equality, preservation of the environment, and economic progress while sustaining a stance on encouraging religious practices (Jan et al. 2022a). Thus, the proposed religious dimension is combined with the economic, environmental, and social dimensions in a single index (see Table 1) to give reliable metrics for assessing the sustainability efforts of businesses. As the corporate sustainability measurement index is postulated to be four-dimensional, including social, economic, environmental, and religious dimensions, procedures outlined in the standard index development research were followed (Churchill Jr 1979). These procedures include item generation, index purification, index dimensionality, index validation, and nomological validity.

3.1.1. Step 1: Item generation

The item generation procedures of the study are based on the three-criteria analytical process. The first one is relevancy, which entails choosing the most important items for corporate sustainability performance enhancement. The second criterion is practicability, which indicates that assessment must be within the scope of a business realm and that items should be "*available, reliable, and practical*". The third factor is appropriateness, which describes the items that might be related to the environmental, social, economic, and religious dimensions of corporate sustainability.

To generate and select new items, an exploratory study was undertaken. The inclusion of these items was based on expert opinion and collective talks with relevant stakeholders. After a detailed discussion, an initial index of 45 items reflecting the four pillars of corporate sustainability was developed based on the studied literature and GRI's standards, encompassing the themes listed in Table 1. For instance, Table 1 enlists a total of 11 items that represent the religious/Islamic aspect, whereas 34 items suggested by the GRI (2020) are related to the conventional aspect. Given that non-Islamic financial organizations do not engage in religious/Islamic sustainability practices, the inclusion of religious indicators in the measurement index renders it applicable only to Islamic financial institutions. Since Islamic banks are governed by the distinct Shariah concept (Islamic values), which makes the whole practice of the industry distinct from conventional institutions. Accordingly, regulatory Shariah compliance makes its sustainability reporting performance more successful than others. The regulatory authorities in Malaysia provide new rules and prospects for enhancing sustainability through the practice of Islamic banks and financial institutions. For example, the introduction of the Value-based Intermediation Information strategy aimed to promote SDGs through Islamic banking (Jan et al. 2022a; Hamad, Lai, and Jan 2020). In this view, the literature indicates some indicators used to perform religious (Shariah-based) sustainability practices. GRI has not yet provided standards for measuring religious sustainability performance. Therefore, items included in the religious dimension of corporate sustainability were generated through a literature review. The GRI's proposed standards were integrated with the items generated through the literature review. All the indicative items of GRI (2020) covering the economic, social, and environmental aspects were selected for inclusion in the initial index as described in Table 1.

Table 1
Item generation and index development

Themes and Codification	Parameters for Measuring an Individual Item: Fully Reported = (02), Partially Reported = (01), No-Reporting = (0)
A. The Economic Sustainability Indicators	
1. “Economic Performance” (EC_1)	Reporting on the funds that were collected and utilized directly; financial implications; defined benefits; and any financial aid received from the government.
2. “Market Presence” (EC_2)	Reporting on wages paid; percentage of management hired.
3. “Indirect Economic Impacts” (EC_3)	Reporting on infrastructure investment and services reinforced; “indirect economic impacts”.
4. “Procurement Practices” (EC_4)	Reporting on the percentage of the amount spent on local suppliers.
5. “Anti-corruption” (EC_5)	Reporting on the procedure assessed for corruption risks; communication & training for anti-corruption strategies; and corruption cases & actions.
6. “Anti-competitive Behavior” (EC_6)	Reporting on actions taken for “anti-competitive behavior”, anti-trust, and monopoly practices.
7. “Tax” (EC_7)	Reporting on the tactics to tax; tax control & risk management; stakeholders and management meeting on tax.
B. **The Environmental Sustainability Indicators**	
8. “Materials” (EN_1)	Reporting on the weight and volume of total material consumed; recycled, reclaimed products; material packaging.
9. “Energy” (EN_2)	Reporting on energy consumed; measures for the reduction of energy; energy intensity; energy consumption and reduction in required energy.
10. “Water and Effluents” (EN_3)	Reporting on the volume of water recycled; withdrawn; discharged; and consumed.
11. “Biodiversity” (EN_4)	Reporting on the activities, products, and services on biodiversity; species with habitats affected by operations; habitats saved or revitalized because of the eco-friendly spending.
12. “Emissions” (EN_5)	Reporting on measures taken to reduce emissions resulting from business travelling and delivery services.
13. “Waste” (EN_6)	Reporting on “waste management” practices applied to the materials and technology that were used, and waste diverted and directed to disposal.

Themes and Codification	Parameters for Measuring an Individual Item: Fully Reported = (02), Partially Reported = (01), No-Reporting = (0)
A. The Economic Sustainability Indicators	
14. “Environmental Compliance” (EN_7)	Reporting on the firm’s compliance with environmental regulations and guidelines.
15. “Supplier Environmental Assessment” (EN_8)	Reporting on new suppliers screened under environmental standards and negative impacts in a supply chain process.
C. **The Social Sustainability Indicators**	
16. “Employment” (SO_1)	Reporting on the turnover of employees and hiring new employees; benefits to employees; and disclosure of parental leave.
17. “Labor/Management Relations” (SO_2)	Reporting on the minimum notice periods for the operational changes.
18. “Occupational Health and Safety” (SO_3)	Reporting on the strategies designed for “occupational health and safety”; risk management; training and consultation on safety and health; and prevention of “occupational health and safety”.
19. “Training and Education” (SO_4)	Reporting on the training and education given to employees; programs for career development.
20. “Diversity and Equal Opportunity” (SO_5)	Reporting on the diversity of employees and governance; and providing equal opportunities for the staff members.
21. “Non-discrimination” (SO_6)	Reporting on the occurrences of discrimination and remedial actions taken.
22. “Freedom of Association and Collective Bargaining” (SO_7)	Reporting on the actions taken to support the right to “freedom of association and collective bargaining”.
23. “Child Labor” (SO_8)	Reporting on child labor identification in the operations of banks and supplier activities and actions taken for that.
24. “Forced or Compulsory Labor” (SO_9)	Reporting on the “forced or compulsory labor” identification in the operations of banks, and activities and actions of suppliers taken for that.
25. “Security Practices” (SO_10)	Reporting on the training of security personnel and human rights policies or practices.

Themes and Codification	Parameters for Measuring an Individual Item: Fully Reported = (02), Partially Reported = (01), No-Reporting = (0)
A. The Economic Sustainability Indicators	
26. “Rights of Indigenous People” (SO_11)	Reporting on the occurrences of violations related to the “rights of indigenous people”.
27. “Human Rights Assessment” (SO_12)	Reporting on operations involving human rights; policy instructions on human rights; investment contracts subject to human rights.
28. “Local Communities” (SO_13)	Reporting on the measures taken to tackle the negative influence of the local community; engaging the local community in development programs and operations.
29. “Supplier Social Assessment” (SO_14)	Reporting on new suppliers screened under environmental standards; negative impacts in a supply chain process.
30. “Public Policy” (SO_15)	Reporting on the financial and political contributions made.
31. “Customer Health and Safety” (SO_16)	Reporting on the categories of products and services for which the “customer health and safety” effects are evaluated and occurrences of non-compliance regarding “customer health and safety”.
32. “Marketing and Labeling” (SO_17)	Reporting on information and labeling required for the product and service, occurrences of non-compliance with information and labeling, and market communication.
33. “Customer Privacy” (SO_18)	Reporting on the identified breaches, losses, or theft regarding the customers' data.
34. “Socioeconomic Compliance” (SO_19)	Reporting on the financial value of penalties for breaking rules governing the distribution and use of goods and services.
D. **The Religious Sustainability Indicators**	
35. “Shariah screening during the investment” (RE_1)	Reporting on the procedures of “Shariah screening for investment” in the Shariah board’s report.
36. “Allocation of profit based on Shariah” (RE_2)	Reporting on the allocation of profit and loss in compliance with Shariah principles in the Shariah board’s report.
37. “Zakat payment” (RE_3)	Reporting on the practice and reporting of the total volume of “zakat payment” during the reporting period.
38. “Qardh-e-Hassan / Benevolent fund” (RE_4)	Reporting on the disclosure of the total amount of “Qardh-e-Hassan/ Benevolent fund” payment during the reporting period.
39. “Charity - Sadaqah – Waqaf” (RE_5)	Reporting on the disclosure of the total amount paid as Charity - Sadaqah – Waqaf during the reporting period.

Themes and Codification	Parameters for Measuring an Individual Item: Fully Reported = (02), Partially Reported = (01), No-Reporting = (0)
A. The Economic Sustainability Indicators	
40. “Disclosure of earnings prohibited by Shariah” (RE_6)	Reporting on the disclosure of “earnings prohibited by Shariah” in the Shariah board’s report.
41. “Compliance with Islamic laws for the environment” (RE_7)	Reporting on the bank’s “compliance with Islamic laws for the environment” during the reporting period.
42. “Islamic training and education to staff” (RE_8)	Reporting on Islamic training and education given to the employees and programs arranged for career development.
43. “Sponsoring pilgrimage” (RE_9)	Reporting on the total number of individuals sent for “pilgrimage” by the bank within a calendar year.
44. “Offering Scholarship” (RE_10)	Reporting on the disclosure of the total amount of money paid for offering the scholarships.
45. “Approval of Products and Services by the Shariah Board” (RE_11)	Reporting on the Shariah board’s approval for a newly developed product or service in the Shariah board’s report.

Table 1 demonstrates the quadruple bottom line (QBL or 4BL) approach for gauging the CSP. The proposed index combines four strands of corporate sustainability such as economic, social, environmental, and religious dimensions. Without considering the triple bottom line approach, a distinct corporate sustainability measurement index cannot be developed. Consequently, the adopt and adapt concept was applied to the recent GRI standards for incorporating the environmental, economic, and social sustainability indicators in the framework.

Nevertheless, due to the shortcomings of GRI standards, the religious sustainability indicators were incorporated into the proposed framework with the support of the “Maqasid Al-Shariah” theory of Al-Ghazali. According to Yusof et al. (2015)Al-Ghazali's theoretical framework can be categorized into three levels: *Daruriyat* (necessities), *Hajiyaat* (complements), and *Tahsiniyaat* (embellishments). Necessities are those principles without which the system of any economy will collapse. Compliments facilitate human lives; if these components are neglected, it will lead to hardship in society. At the same time, embellishments are the elements that deal with moral and ethical behaviors. From a religious perspective, the concert of embellishment will lead to society’s perfection. Al-Ghazali further refined ‘necessities’ into the preservation of five fundamental components – namely – “*al-Din* (religion), *al-Nafs* (life), *al-Aql* (intellect), *al-Nasl* (progeny), and *al-Mal* (wealth)”. All these items are prioritized according to the given order.

The proposed religious sustainability indicators were identified and incorporated based on the principles of “Maqasid Al-Shariah”. For example, the first indicator, “Shariah Screening During the Investment,” is considered necessary and falls under the subcategory of preservation of religion. Since Islam prohibits

investment in haram business, religious firms must sustain and report on such practices. The second indicator, “Allocation of Profit Based on Shariah,” is categorized as a necessity and falls under the subcategory of “preservation of wealth”. It is vital to allocate profit to all stakeholders with full justice and preserve their wealth. The third indicator, “Zakat payment,” falls under the necessities and the subcategory of preservation of religion because it is the key element of Islam. The fourth indicator, “Qardh-e-Hassan,” falls under the category of necessities and the subcategories of the preservation of life and progeny. As such, free loans remove hardships from societies and facilitate human living. The fifth indicator, “Charity-Sadaqah-Waqf,” can be categorized as embellishment. It is not obligatory to pay Charity-Sadaqah-Waqf, but the charity payment reveals the firm’s ethical behavior. The sixth indicator, “Disclosure of earnings prohibited by Shariah,” is categorized as compliments and falls under the subcategory of preservation of religion, life, and wealth. The seventh indicator, “Compliance with Islamic law for the environment,” falls under the category of “necessities” and the subcategory of preservation of life and progeny. Environmental compliance under Islamic law is essential to promote green practices to preserve the interest of future stakeholders. The eighth indicator, “Islamic training and education,” falls under the category of compliments and the subcategory of the preservation of intellect. As such, Islamic education and training for employees will enhance the capabilities of staff to comply with religious principles and ultimately promote decent practices in society. The ninth indicator, “Sponsoring pilgrimage,” falls under the category of embellishment. Since sponsoring pilgrimage is not compulsory, such sponsorships will help society perform religious activities and thus highlight the ethical behaviors of firms. The tenth indicator, “Scholarships,” falls under the category of compliments and the subcategory of the preservation of intellect. The scholarship grants will provide equal opportunities for people to get religious and scientific education as well. The last indicator, “Approval of products and services by the Shariah board,” falls under the category of necessities and the subcategory of preservation of religion. Any product or service produced is evaluated under Shariah principles and afterward is approved by the Shariah board. Hence, the approval of the Shariah board guarantees religiosity in business activities that promotes corporate sustainability practices at the firm level and consequently achieves sustainability in society.

3.1.2. Step 2: Item Purification

The validity and reliability of the index were assessed after the identification of the aforementioned items. There are two sorts of validity: (1) face validity and (2) content validity, which determine whether the index is “professional” or “poorly constructed”. The study confirmed the face validity of the index after thorough proofreading. To ensure the content validity of the index, an expert panel was enlisted to determine whether the instrument is well-constructed or not (Davis 1992). A decade’s data on corporate sustainability was collected from the Shariah-compliant banks operating in Malaysia to test the validity of the construct and optimize the measurement index based on diagnostic capabilities.

A content analysis technique was used to gather data using dummy codes of 0, 1, and 2, respectively. To test the measure of sampling adequacy (MSA), the “Kaiser–Meyer–Olkin” (KMO) test, which specifies a least acceptable value of 0.5, was employed (Malhotra et al. 2003). The findings indicate the value of

KMO = 0.788, which is deemed to be appropriate for factor analysis (Kaiser and Rice 1974). The MSA further facilitated showing the degree to which each matrix component was correlated with the others (Pett, Lackey, and Sullivan 2003; Hair et al. 2010). The MSA values for correlation matrix items were greater than 0.70, demonstrating a significant degree of inter-correlation among the components (Kaiser and Rice 1974). Bartlett's test of sphericity reveals a chi-square value of 3645.363 with 561 degrees of freedom and p-value = 0.000 < 0.05, implying that the "correlation matrix is not an identity matrix" (Shamim, Ghazali, and Albinsson 2017). Thus, it was established that the results are reliable, and we might continue with supplementary analysis such as "exploratory factor analysis" (EFA).

Consequently, an EFA using the "Statistical Package for the Social Science" (SPSS) factor analysis option was used to compute the full factorization and take into consideration low commonalities. In order to verify the variable items, SPSS is the most suitable statistical tool that gives extensive output in comparison to other statistical tools, while improving the variable items using the EFA analysis (Ong and Puteh 2017; Ajmal et al. 2021). The software performs EFA analysis using several estimation methods for extraction, such as the "Principal Component extraction technique", "Principal Axis Factoring extraction technique", and "Maximum Likelihood estimation technique" (De Winter and Dodou 2012). Accordingly, Principal Component Analysis (PCA) was performed on 45 items to evaluate the validity of the index using a varimax rotation option. PCA is deemed appropriate for less established measures (Zahid et al. 2021) and for determining the least number of factors that account for the greatest amount of variation in a collection of gathered variables (Hair Jr, Howard, and Nitzl 2020).

To ensure the accuracy of the results, the factor loading must be greater than 0.50 for all items (Srivastava, 2013). Based on the criteria, 31 items were included, and the rest were eliminated because they were not loading on the anticipated factor. The result of the initial rotated factor indicated four factors with an Eigenvalue greater than 1 and a collective percentage of the variance of 64.108 percent. A total of four items were loaded on factor one, with two cross-loadings and one item showing low factor loading (0.60). Six items were loaded on factor two, with one cross-loading and one item exhibiting low factor loading. The third factor revealed fifteen items with three cross-loadings and one item displaying low factor loading. Lastly, the fourth factor demonstrated nine items with two cross-loadings. Overall, eight items cross-loaded and three items demonstrated low factor loading (0.60) and were therefore removed from further investigation. A second PCA was performed on the remaining items, and the summary of the results remained the same. The factors' reliability was assessed using Cronbach's alpha values recorded for economic sustainability was 0.747, environmental sustainability was 0.703, social sustainability was 0.927, and religious sustainability was 0.903, respectively.

Table 2
Measurement Model Assessment

Constructs	FL	VIF	CA	CR	AVE
Economic Sustainability	-	-	0.747	0.836	0.562
EC1	0.725	1.668			
EC2	0.793	1.438			
EC3	0.692	1.324			
EC4	0.782	1.567			
Environmental Sustainability	-	-	0.703	0.815	0.524
EN3	0.76	1.499			
EN4	0.697	1.362			
EN5	0.735	1.248			
EN6	0.702	1.33			
Social Sustainability	-	-	0.927	0.936	0.513
SO1	0.711	2.176			
SO3	0.651	1.848			
SO4	0.657	1.844			
SO5	0.764	2.57			
SO6	0.734	2.057			
SO7	0.659	1.911			
SO8	0.727	2.489			
SO9	0.724	2.12			
SO10	0.805	2.886			
SO11	0.751	2.719			
SO12	0.769	2.349			
SO13	0.682	2.873			
SO14	0.734	2.556			
SO15	0.643	1.828			
Religious Sustainability	-	-	0.903	0.921	0.567
RE1	0.625	1.734			

Constructs	FL	VIF	CA	CR	AVE
RE2	0.792	2.353			
RE3	0.776	2.162			
RE4	0.7	1.899			
RE5	0.76	2.535			
RE6	0.821	3.062			
RE7	0.786	2.402			
RE8	0.77	2.685			
RE9	0.726	1.941			
Shariah Board	-	-	1	1	1
SB	1	1			

3.1.3. Step 3: Index dimensionalities

Following the recommendation of Anderson and Gerbing (1988)a confirmatory factor analysis (CFA) was carried out on the items. The items showed extensive standardized regression estimates (factor loadings), as depicted in Fig. 2. The factor loadings for economic sustainability ranged from 0.69 to 0.79, environmental sustainability from 0.69 to 0.76, social sustainability from 0.64 to 0.80, and religious sustainability from 0.62 to 0.82. Besides, two of the environmental sustainability items and one of the social sustainability items exhibited low factor loadings (< 0.50) and were subsequently removed because they were also affecting the average variance extracted (AVE).

Further analysis was performed to assess the composite reliability (CR) and convergent validity of the instrument. The model validity test indicates that AVE for the obtained factors is > 0.50 (Fornell and Larcker 1981)and for the obtained factors, the CR is > 0.70. The values reported in Table 2 imply that the index's composite reliability and convergent validity have been confirmed. Results reported in Table 2 demonstrate that all constructs and measurement models are deemed to be appropriate and fit. The VIF values demonstrate how much the standard error increases due to collinearity problems. In SmartPLS, VIF values equal to or greater than 3.3 indicate possible collinearity (Suchman 1995). The values of VIF below the 3.3 threshold demonstrate no collinearity. Furthermore, the measurement model was evaluated using the discriminant validity test, which explains the extent to which the constructs differ from others (Steurer et al. 2005). For instance, the Heterotrait-Monotrait (HTMT) test was performed to measure the discriminant validity. The HTMT test recommends that a reported value > 0.85 is considered ideal, but it should not exceed 0.90 (Vallance, Perkins, and Dixon 2011). The results in Table 3 show that all values are below > 0.85, confirming that the measurement model has discriminant validity.

Table 3
Discriminant validity (HTMT ratio)

Constructs	Economic Sustainability	Environmental Sustainability	Religious Sustainability	Shariah Board
Environmental Sustainability	0.358	-	-	-
Religious Sustainability	0.338	0.439	-	-
Shariah Board	0.206	0.267	0.327	-
Social Sustainability	0.464	0.553	0.471	0.279

3.2. Study 2: Validation of the corporate sustainability measurement index

The focus of Study 2 is to assess the construct validity, reliability, and predictive power of the newly constructed index with extant constructs and to establish its nexus with other variables. As stated, the notion of sustainable development considers the execution of a business model that integrates corporate sustainability's economic, social, environmental, and religious aspects. This underlines the practical conceptualization of sustainability practices in business procedures. To determine the nomological validity of the corporate sustainability measurement index, we established a relationship between Shariah governance, proxied by the Shariah board, and corporate sustainability. As the newly developed index is four-dimensional, we subsequently established the relationship of the Shariah board with all four aspects of corporate sustainability.

3.2.1. Shariah board and corporate economic sustainability

From an agency theory perspective, businesses must design a strategic tool to address the concerns of all stakeholders. In this instance, Islamic banks establish a Shariah board that acts as a check-and-balance tool and ensures the interests of all concerned stakeholders (shareholders and stakeholders) (Jan et al. 2021). Shariah board satisfies shareholders through profit maximization and economic progress, which helps in promoting corporate economic sustainability and achieving success in the long run. The GRI describes economic sustainability as "*a firm's impact on the economic conditions of its stakeholders, society, and economy at local, national, and international levels*" (Harelimana 2017). In the banking context, economic sustainability is becoming imperative for their existence and long-term success (Preacher and MacCallum 2002).

Also, it enables banks to improve their financial gains, which boosts shareholders' confidence through profit maximization (Preacher and MacCallum 2002). Besides the firm level, economic sustainability is also concerned with economic progress and growth at the macro-level (Kesa 2021). Jan, Lai, and Tahir (2021) argued that corporate economic sustainability could be enhanced by executing a sturdy governance mechanism. Consistent with this argument, the current study aims to explore the role of the

Shariah board in promoting economic sustainability. The Agency theory of Jensen and Meckling (1976) also advocates for the introduction of the Shariah board in encouraging economic sustainability. The existing literature provides evidence of the relationship of the board of directors with economic sustainability. Nevertheless, limited literature exists on the nexus of the Shariah board and economic sustainability. Consequently, based on the recommendation of Jan, Lai, and Tahir (2021)this research aims to test the given nexus and thereby proposes that:

H1: Shariah board has a significant positive effect on corporate economic sustainability.

3.2.2. Shariah board and corporate environmental sustainability

With the growing social concern about environmental degradation, corporations' commitment to environmental sustainability measurement has increased over the last few years (Khan, Johl, and Johl 2021; Khan, Johl, and Akhtar 2022; Jan et al. 2022b). Resource depletion, biodiversity loss, ecosystem service deterioration, and rising pollution are the key challenges that significantly impact humans and their actions on the planet (Zahid and Ghazali 2017; Shad et al. 2019). To address these challenges, corporations, NGOs, and national governments are required to coordinate and actively participate in environmental sustainability practices.

Like other organizations, banks should also be cognizant of environmental issues, especially long-term planning (Lubchenco, 1998). For this, banks need to develop and execute appropriate environmental policies to cope with sustainability-related issues and achieve environmental sustainability (Jan, Lai, and Tahir 2021). Environmental sustainability encompasses all the banks' attempts to mitigate the negative impacts of their actions on natural resources and the environment, such as air, water, and land (Margaret, 1993). In addition, banks can minimize the negative impacts of their products and services by reducing the packaging that harms the environment and recycling the garbage (Kesa, 2021; Kurila, Lazuras, and Ketikidis, 2016; Naspetti et al., 2017). To do so, banks must implement a competent monitoring mechanism to oversee the overall actions of banks. In this instance, Islamic banks implement a Shariah board to monitor the function of banks (Jan et al., 2020).

Thus, from the agency theory viewpoint, the Shariah board is likely to work in the interest of all concerned stakeholders and enhance the Islamic banks' environmental sustainability. Nevertheless, limited empirical work exists on the impact of the Shariah board on corporate environmental sustainability performance. Based on the recommendation of (Jan, Lai, and Tahir 2021)this research aims to empirically test the given nexus and, therefore, suggests that:

H2: Shariah board has a significant positive effect on corporate environmental sustainability.

3.2.3. Shariah board and corporate social sustainability

The Shariah board is considered a vital tool for generating beneficial societal outcomes (Jan, Lai, and Tahir 2021) by driving firms to improve general societal wellbeing (Kerr, Hill, and Till 2018). Social

sustainability has a strong focus on fairness and integrity toward society (Hillenbrand and Money 2007). It emphasizes the contributions of businesses to society, especially in the long run (Kerr, Hill, and Till 2018). The GRI defines social sustainability as "*the dimension of sustainability concerns about the impacts of the organization on the social systems within which it operates*" (Shad et al. 2020). Based on this, corporations are required to focus on meeting human needs and increasing the potential for sustainable development (Shahzad et al. 2022). Given that Islamic banks were introduced to promote social wellbeing. Accordingly, Islamic banks need to execute a strong governance mechanism to promote social justice (Jan et al. 2021)while enhancing their economic viability (Tahir et al. 2020; Ali et al. 2021). In this regard, this research aims to explore the role of the Shariah board in improving social sustainability. Also, the agency theory of Jensen and Meckling (1976) supports the supervisory function of the Shariah board in promoting social sustainability. Jan, Lai, and Tahir (2021) conceptualized the relationship between the Shariah board and social sustainability, but the literature provides limited empirical evidence on the given nexus. Therefore, this research aims to empirically examine this nexus and propose that:

H3: Shariah board has a significant positive impact on corporate social sustainability.

3.2.4. Shariah board and corporate religious sustainability performance

Corporate religious sustainability is imperative for gaining competitive advantage and maintaining the long-term viability of businesses that operate within social and religious constraints. Even though the notion of religious sustainability has not been described in prevailing business terms, it is obvious and understood in practice. This implies that corporations need to evaluate their religion-related actions in business procedures and link them with the underlying goals of sustainability. It is crucial because of businesses' requirement to design a strategy to address the discrepancy between their religious practices and the underlying goals of sustainability (Jan et al. 2022a). Although corporate religious practices have different meanings and descriptions, their ultimate goal is to achieve sustainability. For example, the payment of Zakat is a religious practice, and its denial is a sin from the Islamic perspective (Haniffa and Hudaib 2007), which contributes to economic prosperity and the benefit of society. Likewise, providing funds for the betterment of the environment can result in the environment's quality improvement and vice versa.

Consequently, this research suggests incorporating these practices under the umbrella of the religious dimension of corporate sustainability to provide an understanding of the concept and its implications for sustainability. Accordingly, Islamic banks need to establish a strong Shariah board to strengthen their religious activities and achieve sustainability. Since there is no evidence of the relationship between the Shariah board and religious sustainability, we propose that:

H4: Shariah board has a significant positive impact on corporate religious sustainability.

To test the proposed hypotheses, this research applied a structural model method using SmartPLS. In addition, R-Square (R^2), Variance Inflation Factor (VIF), Effect Size (f^2), coefficients, and P-value are all included in the analysis of the structural model (Steurer et al. 2005). The structural model results are illustrated in Tables 4 and 5. The R^2 for economic sustainability is 0.015, for environmental sustainability is 0.062, social sustainability is 0.084, and religious sustainability is 0.112, respectively. The findings confirmed the hypothesized relationship between the Shariah board and corporate sustainability performance. Similarly, all the Q^2 values are greater than zero, indicating that the model has predictive relevance. Additionally, Q^2 signifies the predictive relevance values provided by the variables. The f^2 represents the effect size of the model. Table 5 shows the effect size ranged from 0.006 to 0.109, which falls under the small category. Table 5 shows the path coefficients of the structural model utilized to evaluate the hypotheses. The results of the structural model revealed that the standardized coefficient path (β) among the nexus of the Shariah board and economic sustainability is 0.061, t = 1.271, and P = 0.204. This implies that the Shariah board has an insignificant impact on economic sustainability and thereby rejects H1. The statistics reported in Table 5 confirm that H2 is supported. The standardized path coefficient (β) between the Shariah board and environmental sustainability was 0.229, t = 5.089, and P = 0.000. Also, the statistics show that the Shariah board positively influences social sustainability and confirm that H3 is supported. For this path, β = 0.281, t = 6.535, and p = 0.000. Lastly, the reported statistics, i.e., β = 0.315, t = 11.667, and p = 0.000 confirm that the Shariah board has a positive association with religious sustainability and support H4.

Table 4
Coefficient of determination and predictive relevance

Construct	**R^2**	**Q^2**
Economic sustainability	0.015	0.006
Environmental sustainability	0.062	0.028
Social sustainability	0.084	0.041
Religious sustainability	0.112	0.058

Table 5
Hypotheses Testing

Structural paths	β value	STDEV	*t*-value	p-value	Confidence Interval		f^2	Remarks
					LL	UL		
SB ◊ EC	0.061	0.048	1.271	0.204	-0.027	0.139	0.006	Rejected
SB ◊ EN	0.229	0.045	5.089	0.000	0.142	0.301	0.056	Supported
SB ◊ SO	0.281	0.043	6.535	0.000	0.201	0.347	0.084	Supported
SB ◊ RE	0.315	0.027	11.667	0.000	0.269	0.359	0.109	Supported

4. Discussion

This research makes a significant contribution to corporate sustainability research by developing a novel measurement index for assessing corporate sustainability. The study followed the index development guidelines of Churchill Jr (1979). To be explicit, the study attempts to conceptualize a quadruple bottom line approach for measuring the corporation's contribution to sustainability. With so many distinct instruments proposed to measure corporate sustainability, it seems rational that numerous approaches (i.e., embedded with various tools and techniques) would be established to measure a corporation's contribution to sustainability. Undoubtedly, each paradigm has advantages and drawbacks that could be new research avenues for strengthening corporate sustainability approaches. In this instance, existing research provides an indication of a corporation's triple bottom line assessment, e.g., (Jan, Lai, and Tahir 2021; Zaid et al. 2020; Hussain, Rigoni, and Orij 2018; Sánchez-Chaparro, Soler-Vicén, and Gómez-Frías 2022; Farooq et al. 2021; Henry, Buyl, and Jansen 2019; Muñoz-Pascual, Curado, and Galende 2019; Liute and De Giacomo 2021; Jan et al. 2022a) but lacks evidence on the quadruple bottom line approach.

To provide a viable and meaningful instrument for corporate sustainability, methods should not be limited to the established concepts and indexes. Accordingly, a quadruple bottom line approach was established, including economic, social, environmental, and religious dimensions of corporate sustainability. Having a religious sustainability measurement tool is crucial for moral and ethical considerations. From this perspective, Islamic banks ought to have indicators that demonstrate their adherence to Shariah principles in specific areas and their attainment of sustainability in general (Jan et al. 2022a).

Although the introduction of the religious dimension is a major contribution in itself, the introduction of religious indicators and their subsequent execution in business strategy make the corporation's contribution to sustainability more prominent. As Islamic banking's practices are based on Shariah principles, its performance should also be assessed through Shariah approaches. Drawing on the postulations of agency theory, this research posits that the Shariah board, as a foremost check-and-balance tool, can shape a business's strategies in promoting corporate sustainability practices. The

supervisory function of the Shariah board ensures corporate sustainability through various social practices such as zakat payment, providing free loans, compliance with Islamic laws for the environment, Islamic training and education, and offering scholarships, etc. The findings also confirmed the crucial role of the Shariah board in promoting the quadruple bottom line of corporate sustainability. The empirical results of study 2 validate the dimensions of the corporate sustainability index. This study thereby establishes the nomological validity of the newly developed measurement index.

4.1. Theoretical Contributions

In terms of theoretical contribution, this research adds to the existing body of knowledge in several ways. First, this research is among the pioneers in conceptualizing the idea of developing a quadruple bottom-line approach for measuring corporate sustainability. The study provides a new perspective on understanding the significance of religious norms in determining individual and corporate behavior toward sustainability. The religious aspect of corporate sustainability was introduced to give a clear view of the notion and, subsequently, was incorporated into the triple bottom line of corporate sustainability. The religious sustainability indicators were generated through a literature review.

Consequently, the measurement items were refined, and the construct validity was confirmed through reliability analysis. This research thereby provides a theoretically sound and statistically valid index for measuring corporate sustainability. Last but not least, this research is the first to test the nexus between the Shariah board and corporate sustainability performance. The study found that the execution of the Shariah board is crucial for sustainability at the firm level and might become the basis for sustainability at the global level.

4.2. Practical/Social Implications

This research contends that engaging in religious practices and reporting can help businesses gain a competitive edge and improve their corporate and sustainability performance. For instance, the proposed religious dimension and measurement indicators are widely applicable to various firms and industries such as Shariah-compliant companies and the Islamic banking industry. Nonetheless, several other businesses owned and operated under Christianity and Buddhism, etc., can introduce their own indicators contributing to various aspects of sustainability. Given that the banking industry provides financing to coal industries, which are deemed accountable for environmental degradation. In dealing with such issues, numerous banks do not reveal the initiatives taken to minimize future sustainability-related issues. In this regard, the disclosure of reports on religious practices in dealing with economic, social, and environmental issues will boost the goodwill of Islamic banks. This is because the concerned stakeholders will be confident that the banks' impact on society and the environment will be handled responsibly. As a result, the banks' quadruple bottom line will remain intact, which will help in attracting environmentally friendly and socially conscious investors. The influx of socially responsible investments may lead the firms to achieve corporate sustainability and contribute to global sustainability.

4.3. Policy-maker Implications

Sustainability-related challenges, such as increased poverty levels, environmental degradation, growing social inequalities, etc., have given rise to formulating and implementing different business strategies in global organizations. This research suggests that for the actual involvement of corporations in sustainability, policymakers need to consider executing religious practices as a component of corporate sustainability. Additionally, this research intends to draw attention to the execution of religious policies, similar to the attention paid to economic, social, and environmental policies.

Implementing religious policies will enable Islamic banks to manage economic challenges through zakat, environmental risks through compliance with Islamic laws for the environment, and social issues through Shariah compliance and equal opportunities. This not only helps businesses create a competitive edge but also helps policymakers alleviate sustainability issues. The index developed in this research might be useful to the policymakers of Islamic banks in measuring and assessing corporate sustainability according to Shariah (Islamic law). This might help Islamic banks better meet the needs of their stakeholders, especially in terms of religious norms. Based on this, corporate executives should emphasize religious policies as a key component in attracting new religious customers/investors and enhancing the existing customers' trust in Islamic banking. Furthermore, the regulatory authorities need to encourage Islamic banks to implement and disclose religious policies in corporate sustainability reports to ensure that Shariah rules are followed in banks' operations.

4.4. Limitations and Future Research Directions

Although this research provides a novel contribution to the body of knowledge on corporate sustainability, it is also subject to certain limitations that must be considered when generalizing its findings. First, this research has only focused on a specific country and industry's data, such as Islamic banks. Future studies should consider multiple countries and sectors operating under specific religious norms. Second, this research utilized a limited sample size, which might have affected the results of the study and influenced their generalization. Third, the quadruple bottom line of corporate sustainability has been developed based on GRI (2020) standards, which could have introduced bias in the sample. Future studies may consider the inclusion of alternate sustainability reporting standards. Fourth, the fourth pillar, such as the religious aspect, is conceptualized and validated using specific religious standards (i.e., Shariah-based practices) and therefore should be limited to Shariah-based firms. Future research studies are required to integrate universal standards of religious groups to give a holistic view of the anticipated religious aspect of corporate sustainability. This research suggests the introduction of other spiritual standards followed by different religious-based firms.

For instance, firms operating under Christianity and Buddhism can introduce and incorporate their own religious norms into the proposed corporate sustainability index. As all organized religions intend to promote sustainability, the proposed religious dimension will help the policymakers of religious-based firms in understanding and reporting the actual contributions of corporations towards sustainability. Fifth, reporting on the contributions of corporations towards global sustainability programs such as SDGs is essential. Future studies should address SDGs in their reports by linking sustainability elements with SDGs and their respective targets to provide insight into the firms' contributions to attaining global

sustainability. Finally, this research conceptualized the role of Islamic corporate governance in achieving SDGs (macro-level) by promoting corporate sustainability practices (micro-level).

5. Conclusion

The formation and execution of business strategies that can enhance progress toward corporate sustainability and the achievement of sustainable development continue to attract global attention. To this end, the past two decades have witnessed the execution of extensive measures by governments, regulatory authorities, NGOs, and public corporations to promote sustainable business practices. This goal can be advanced by focusing on the development of measurement tools and indicators for evaluating the corporation’s contributions to sustainability. Accordingly, this research develops a multidimensional index for measuring corporate sustainability. This research introduces the concept of the religious aspect of corporate sustainability and integrates it with the triple bottom line, which advances the idea of the quadruple bottom line. The religious dimension of sustainability has been deployed to advertise the UN’s sponsored visions of Sustainable Development (SD) and the firms' religious sustainability practices. Religious sustainability is a significant aspect of sustainable development, achieved through diverse societal activities. The prevailing norms would persuade the executives of religious-based firms to boost sustainable investments and initiatives. This study has also provided notable evidence that religious sustainability is to be considered an imperative fourth dimension. The index will also provide an opportunity to measure the firm's Quadruple bottom line (QBL or 4BL).

Furthermore, the index development procedures suggested by prior research were followed. The newly developed instrument was validated nomologically by testing the dimensions of corporate sustainability. The results confirmed four dimensions of corporate sustainability – namely economic, social, environmental, and religious aspects – including 34 indicators. Hence, this research becomes a pioneer in establishing the idea of a quadruple bottom line for evaluating corporate sustainability. This research provides a strategic perspective for the regulatory authorities to execute religious norms as a business strategy not only to enhance the firm’s goodwill but also to boost the firm’s capabilities in attaining sustainability. This research concludes that the concept of the quadruple bottom line will gain traction in the future and will open up new avenues for measuring the corporation’s contribution towards sustainability.

Declarations

Conflict of Interest/ Ethical statement:

The authors declare no conflict of interest. The authors would like to confirm that this paper is an outcome of the authors’ own work and has not been published elsewhere nor is it considered for publication elsewhere.

Clinical Trial Number

Clinical trial number: not applicable.

Ethics, Consent to Participate, and Consent to Publish

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Author Contribution

Conceptualization, AAJ and PAK; methodology,AAJ and SQA.; validation, SEAA and SH.; writing, AAJ.; writing—review and editing, S.E.A.A; visualization, SEAA; supervision, AAJ. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement:

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

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Figures

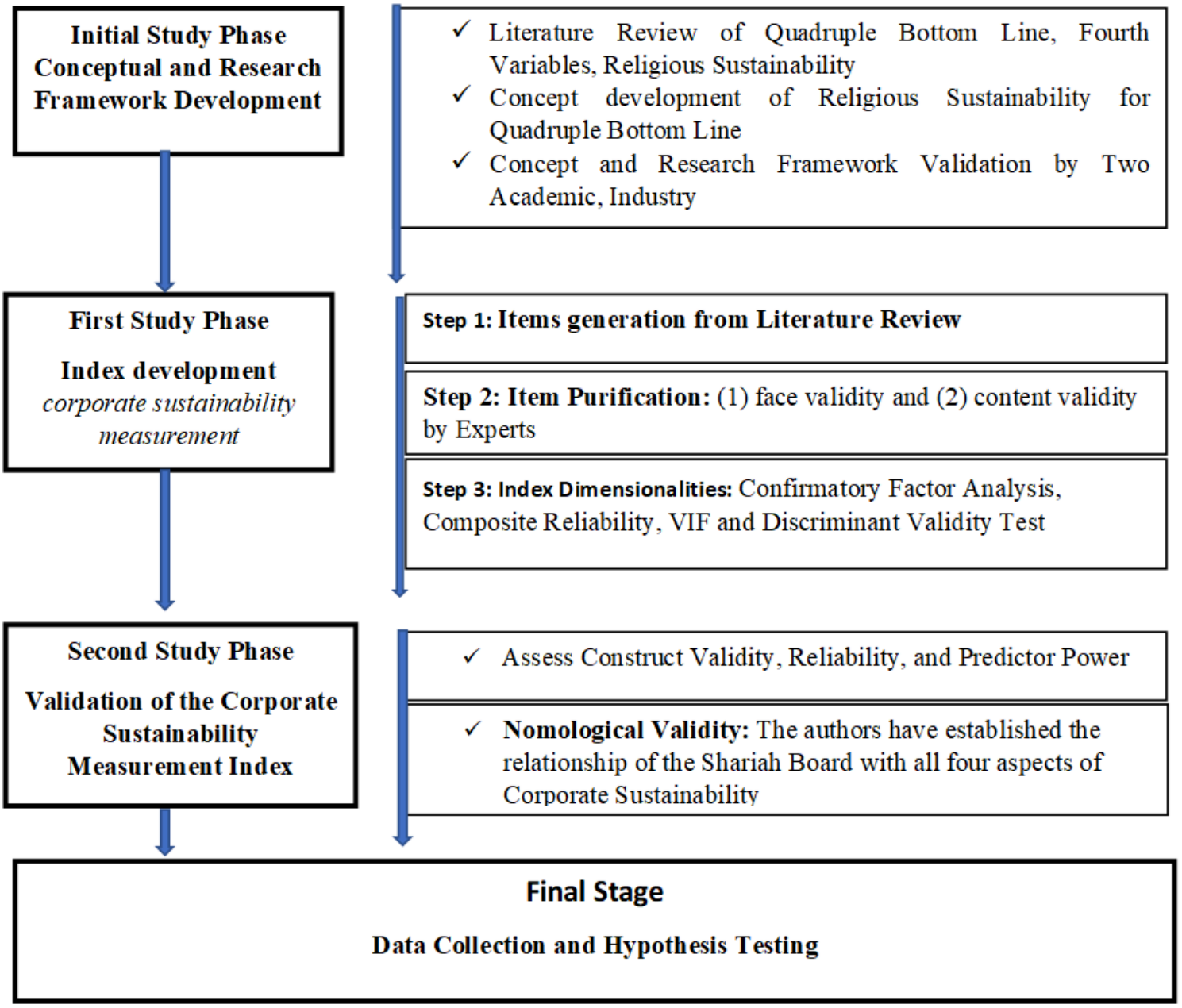


Figure 1

Methodological Steps (Authors' Source)

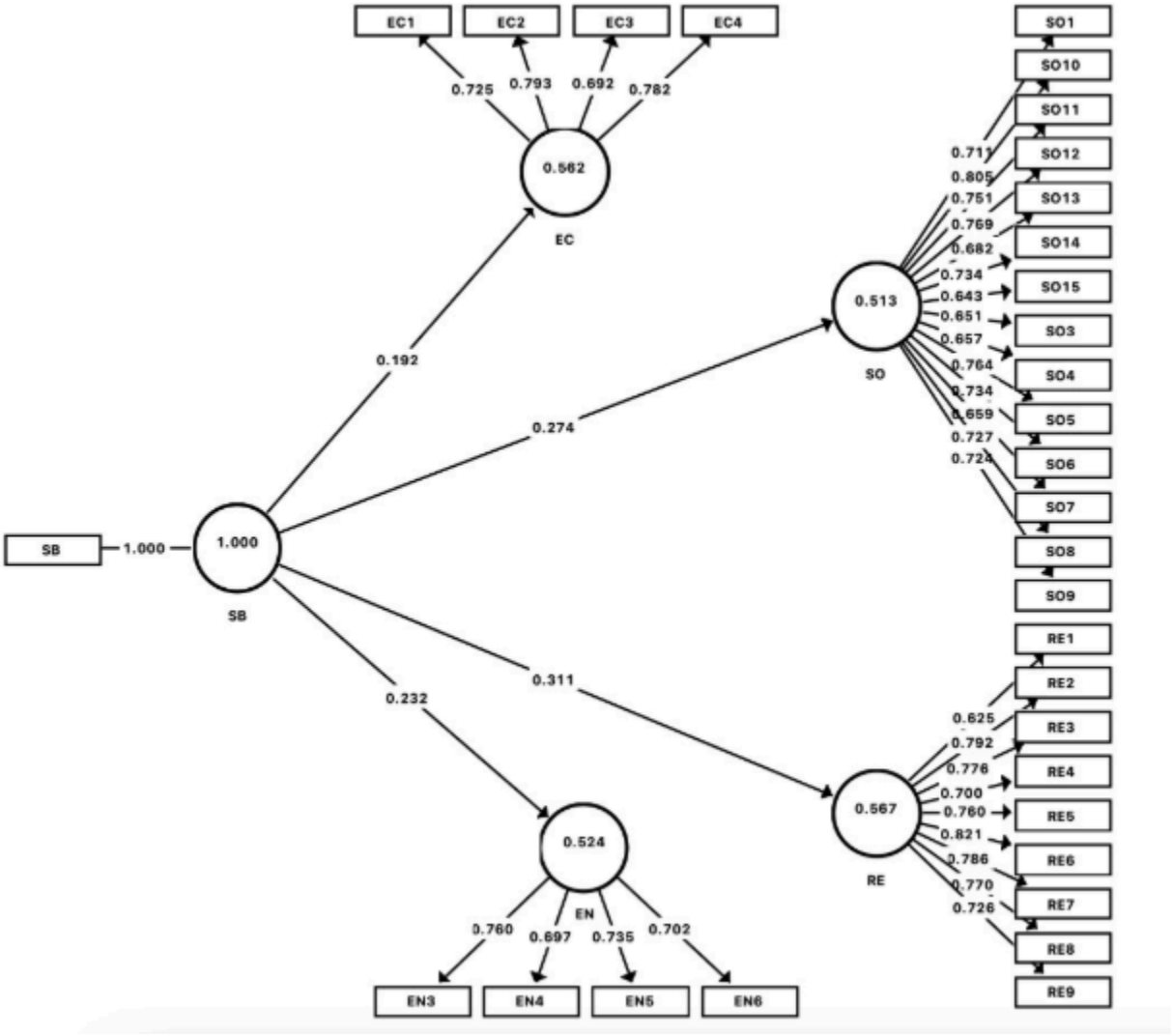


Figure 2

Confirmatory Factor Analysis