

The Impact of The Green Bonds on The Financial Sustainability: Evidence From Egypt

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Abstract:

Egypt's Vision 2030 delineates a comprehensive national strategy aimed at fostering sustainable development, with a particular emphasis on environmental conservation and economic advancement. Central to this vision is the integration of green finance instruments, notably green bonds, as pivotal tools for realizing environmental objectives while driving economic growth. However, the successful implementation of green bonds faces multifaceted challenges, including market dynamics, regulatory frameworks, and the establishment of robust monitoring mechanisms. This research conducts an in-depth exploration of the intricate relationship between green bonds, environmental sustainability, and economic development within the context of Egypt's Vision. Drawing on a synthesis of academic literature and insights gleaned from international case studies, the study critically evaluates the mechanisms for implementing green bonds. It also identifies the financing challenges and opportunities inherent in Vision green economy aspirations, while proposing strategic pathways to enhance the efficacy of green bond deployment. Formulating a set of research hypotheses, the study examines the alignment of green bond implementation mechanisms with Vision 2030 objectives, evaluates the impact of market perceptions and regulatory frameworks on green bond financing effectiveness, and assesses the role of international collaborations in mitigating financing challenges. Furthermore, the research explores key variables such as environmental impact, green bonds, and financial sustainability to elucidate their interconnections and implications for sustainable development. By offering nuanced insights and actionable recommendations, this research aims to enrich the discourse on sustainable development and financial innovation in Egypt. It seeks to bridge existing knowledge gaps, inform strategic decision-making processes, and facilitate the formulation of evidence-based policies conducive to realizing Egypt's sustainable development aspirations outlined in Vision 2030.

Keywords: Egypt's Vision 2030, Green Bonds, Sustainable Development, Financial Innovation, Environmental Sustainability, Economic Growth.

1.Introduction

Egypt's Vision 2030 emphasizes the critical relevance of sustainable development, defining a comprehensive national roadmap aimed at protecting natural resources for future generations' prosperity. The vision plays a critical role in raising Egyptians' environmental consciousness and instilling a sense of communal responsibility for nature protection, climate change mitigation, and the creation of a pristine, secure, and sustainable environment. As the vision takes shape, a key issue emerges in the form of the nation's growing demand for financial resources to move it towards a green economy. As a result of this requirement, the financial landscape is undergoing a strategic reevaluation, with a clear emphasis on green bonds as a powerful instrument for channeling capital into ecologically oriented enterprises. This financial instrument emerges as a key component in the realization of Egypt's Vision 2030, contributing significantly to the vision's sixth strategic goal under the energy axis. This aim delineates a path characterized by reduced greenhouse gas emissions, prudent energy consumption, and a dramatic transition towards sustainable, clean, and renewable energy sources (Financial Supervisory Authority, 2018).

Vision 2030's intellectual underpinnings encompass several realms, including economic, social, and environmental dimensions. In the face of a worldwide responsibility to address environmental degradation and climate change, Egypt's commitment to safeguarding natural resources becomes a critical component of its growth strategy. The sixth strategic aim, which exemplifies the nation's commitment to navigating a sustainable energy future, takes on special relevance within this comprehensive framework. It necessitates a complex strategy that integrates environmental stewardship with economic growth, with the reduction of greenhouse gas emissions at its center. (Abdel-Maksoud, 2020)

The fostering of environmental consciousness among Egyptian individuals is critical to the accomplishment of Egypt's Vision 2030. The vision recognizes that informed and conscientious citizens are essential for long-term development. As a result, a concerted effort is ongoing to enhance environmental consciousness, emphasizing the inherent relationship between environmental health and social well-being (Brown & Miller, 2012). This public awareness campaign complements the vision's emphasis on climate change mitigation by recognizing the interconnection of global environmental concerns and the need for proactive, adaptable actions.

As Vision 2030 promises a green economy, financial practices must undergo a paradigm leap. A green economy requires not just a rebalancing of economic activity, but also a fundamental realignment of financial processes. In this setting, green bonds emerge as a strategic instrument for financing activities that align with the vision's environmental goals (Carhart, 1997). These bonds, which are expressly designated for funding projects with demonstrable environmental benefits, reflect a concrete commitment to sustainable finance. In the larger context of funding the transition to a green economy, their issuance, distribution of money, and subsequent monitoring of project outcomes form a complex yet critical

procedure. moreover, the effectiveness of green bonds is not without obstacles. Market attitudes, legal frameworks, and the requirement for strong monitoring and reporting methods all provide significant challenges. Addressing these issues is critical to ensure the long-term viability of green bonds as a funding vehicle for Vision 2030. On the other hand, possibilities abound to increase the effect of green bonds. Leveraging international cooperation, improving regulatory frameworks, and encouraging investor trust stands out as avenues for maximizing the potential of green bonds within the context of Egypt's growth ambition (Brown & Miller, 2012).

Examining international case studies offers useful insights into the effective implementation of green bonds in a variety of circumstances. Learning from nations that have successfully used green bonds provides benchmarks and best practices that can improve Egypt's strategy. Identifying projects within Egypt that match with Vision 2030 objectives and are appropriate for green bond funding is also critical. This investigation includes possible projects ranging from renewable energy initiatives to biodiversity conservation activities that might be accelerated by green bond funding.

2. Business Problem Focus and Project Purpose

The purpose of this in-depth investigation is to present a comprehensive academic knowledge of Egypt's Vision 2030, the role of green bonds, and the delicate interplay between environmental sustainability, economic development, and financial innovation. This analysis seeks to contribute to the broader discourse on sustainable development and the pivotal role of financial instruments in shaping nations' future trajectory by delving into the foundational principles of Vision 2030, the imperative for raising environmental awareness, the conceptualization of a green economy, and the mechanisms and challenges associated with financing through green bonds.

2.1. Research Problem.

This research's problem is to figure out how green bonds may best help Egypt move to a green economy under Vision 2030, while also addressing gaps in understanding the processes, constraints, and possibilities particular to the Egyptian financial system. The study seeks to identify barriers to the effective integration of green bonds and give insights into how to strategically exploit this financial instrument for long-term development goals in Egypt.

2.2. Research Purpose

This study aims to evaluate the role of green bonds in funding the green economy as defined in Egypt's Vision 2030. The goal is to identify particular issues impeding the successful use of green bonds, find potential for optimization, and give insights to the refinement of finance strategies linked with sustainable development objectives.

2.3. Research Objective.

- Evaluate the mechanisms for implementing green bonds in Egypt:
- Examine the procedural complexities involved in the issuance, allocation, and monitoring of funds from green bonds in Egypt's financial environment.
- Examine the regulatory frameworks that control green bonds to determine their compatibility with Vision 2030 goals.
- Examine the efficacy of present procedures for allocating cash to initiatives that contribute to environmental sustainability.

2.4. Research hypothesis:

H1: Green Bond Implementation Mechanisms are Adequately Aligned with Vision2030 Objectives.

- Null Hypothesis (H0): There is no meaningful connection between the green bond implementation procedures and the Vision 2030 environmental sustainability targets.
- Alternative Hypothesis (H1): Green bond implementation methods are strongly aligned with Vision 2030 objectives.

H2: Market Perceptions and Investor Confidence Influence Green Bond Financing Effectiveness.

- Null Hypothesis (H0): Market perceptions and investor confidence have no substantial impact on the success of green bond financing in Egypt.
- Alternative Hypothesis (H2): Positive market perceptions and greater investor confidence improve the efficacy of green bond financing considerably.

H3: Regulatory Frameworks Provide Both Obstacles and Opportunities for GreenBond Integration.

- Null Hypothesis (H0): The existing regulatory frameworks do not present major hurdles or possibilities for the successful integration of green bonds into Egypt's financial ecosystem.
- Alternative Hypothesis (H3): Regulatory frameworks provide major barriers as well as considerable potential for green bond integration.

H4: International Collaborations Play a Critical Role in Mitigating Green Bond Financing Challenges.

- null hypothesis (H0): International partnerships have no substantial influence on alleviating issues connected with green bond financing in the context of Vision 2030 .
- Alternative Hypothesis (H4): International cooperation are critical to effectively

minimising the risks associated with green bond financing.

H5: Improving Current Mechanisms and Regulatory Frameworks Will Increase the Impact of Green Bonds.

- Null Hypothesis (H0): There is no substantial influence on optimising the impact of green bond financing in Egypt by improving present procedures and regulatory frameworks.
- Alternative Hypothesis (H5): Improving present processes and regulatory frameworks improves the impact of green bond financing considerably.

H6: Strategic Alignment of Green Bond Investments with Specific Projects Strengthens Vision 2030 Goals.

- Null Hypothesis H0: There is no substantial benefit of strategically matching green bond investments with specific projects on Vision 2030 targets attainment.
- Alternative Hypothesis (H6): Strategically connecting green bond investments with specific projects greatly improves Vision 2030 accomplishment.

3. Research Background

3.1. the definition of Green Bonds.

There is a diversity of perspectives on the definition of green bonds. According to the International Capital Market Association (ICMA, 2021), green bonds refer to any bond instrument where the proceeds or an equivalent amount are exclusively dedicated to financing or refinancing new and/or existing eligible Green Projects, aligned with the four core components of the GBP. In contrast, the World Bank (WB) defines green bonds as debt securities issued to raise capital specifically for climate-related or environmental projects (World Bank, 2015). On the other hand, the Egyptian Financial Regulatory Authority (FRA, 2021) characterizes green bonds as fixed-income instruments explicitly designed to support specific climate-related or environmental projects. Ultimately, the WB definition is preferred due to its comprehensive nature and the specific earmarking of collected proceeds to a dedicated account, offering more control over the green funds (Sullivan & Gouldson, 2017).

World Bank. (2015). Green Bonds: Key Features.

Green bonds vary from conventional bonds in that they are labelled as "green" by the bond's issuer. This mark implies the issuer's clear and particular commitment to utilise the proceeds only to finance or refinance, in part or in full, new and/or existing qualifying green projects. Projects that adhere to globally recognized criteria, such as the four basic components of the Green Bond Principles (GBP) or the Climate Bonds Initiative (CBI) (Kaminker, 2015; OECD, 2015). Kaminker, C. (2015). Mobilising Bond Markets for a Low-Carbon Transition. OECD Publishing

However, the CBI operates as a global non-profit organization with a focus on investors.

Established in 2010, the CBI presents a systematic framework that underpins the requirements for projects and assets aligned with the Paris Climate Agreement.'20 aims. This framework is used to determine who is eligible to participate in a Certified Climate Bond, Certified Climate Loan, or Certified Climate Debt Instrument. The Green Bond Principles (GBP) were launched in 2014 as a collection of voluntary best practices recommendations. A consortium of investment banks, including Bank of America Merrill Lynch, Citi Bank, Crédit Agricole Corporate, and UBS, sponsored. this project. JPMorgan Chase, BNP Paribas, Daiwa, Deutsche Bank, Goldman Sachs, HSBC, Mizuho Securities, Morgan Stanley, Rabobank, and SEB are among the investment banks. Subsequent management and refining of these principles has been delegated to an autonomous secretariat overseen by the International Capital Market Association (ICMA). Organization for Economic Co-operation and Development (OECD). (2015). Green Bonds: Mobilizing the Debt Capital Markets for a Low-Carbon Transition.

It is worth noting, however, that green bonds are classed according to the kind of issuer, which includes sovereign bonds, supranational, sub-sovereign, and agency (SSA) bonds, municipal bonds, and corporate bonds. Only sovereign bonds, or bonds issued by the government, are eligible, In the Egyptian setting, governments and corporate bonds (bonds issued by corporations) exist. (Sullivan & Gouldson, 2017)

3.2. Green Financial Instruments

Existing literature has analysed and defined numerous green financial instruments (e.g., Bai, Chu, Shen, & Wan, 2021; Falcone & Sica, 2019; Heinkel, Kraus, & Zechner, 2001; Maltais & Nykvist, 2020; Miroshnichenko & Mostovaya, 2019). We define by combining these concepts Private loans, public bonds (corporate, municipal, and sovereign), private equity, public equity, investment funds, and other financial instruments that fund environmental and climate-friendly projects such as renewable energy, recycling, and green infrastructure that supports the net-zero carbon economy and mitigates climate change are examples of green financial instruments. Green bank loans and green bonds are the most prevalent and prominent financial products when it comes to trends and developments in green financial instruments (Gilchrist, Yu, & Zhong, 2021). Buchner et al. (2021) discover that in 2021, the bulk of the green Finance (61%) was obtained through green financing (loans and bonds), equity investment (33%), and government and institutional grants (6%). Green derivatives (Little, Hobday, Parslow, Davies, & Grafton, 2015), green insurance (Mills, 2012), carbon tax (O'Mahony, 2022), and carbon investment and pricing instruments (Hafner, Jones, Anger-Kraavi, & Pohl, 2020) are other typical green financial products (Abdel-Maksoud, 2020).

Most green financial instruments are used to support renewable energy (e.g., solar and onshore wind), mostly from the private sector, with low-carbon transport being the second biggest and fastest-growing sector in terms of investment objectives. recruiting capital (Buchner et al., 2021). According to research, East Asia-Pacific nations are leading the way in promoting green instruments to promote the innovation and development of publicly

traded enterprises (Buchner et al., 2021; Taghizadeh-Hesary & Yoshino, 2019). Furthermore, the private sector adopts green financial instruments quicker than the state sector, with private banks leading the way in granting green loans (Lalon, 2015). We urge policymakers to learn from more developed countries.

3.3. Use of Proceeds

The cornerstone of a Green Bond is the use of bond revenues for qualifying Green Projects, which should be correctly defined in the bond's legal documentation. security. All identified qualified Green Projects must deliver obvious environmental benefits, which will be reviewed and, when possible, quantified by the issuer. If all or a portion of the proceeds are or may be used for refinancing, it is recommended that issuers provide an estimate of the share of financing vs. re-financing, and where appropriate, also clarify which investments or project portfolios may be refinanced, and, to the extent relevant, the expected look-back period for refinanced eligible Green Projects. The GBP expressly recognises five broad areas of eligibility for Green Projects that contribute to environmental goals such as climate change mitigation and climate change adaptation. Adaptation, natural resource conservation, biodiversity conservation, and pollution avoidance and management are all important considerations. While illustrative, the following list of project categories reflects the most widely utilised types of projects funded or projected to be supported by the Green Bond market. Green Projects comprise assets, investments, and other associated and supporting expenditures, such as R&D, that may be tied to more than one category and/or environmental goal. Three of the above-mentioned environmental objectives (pollution prevention and control, biodiversity protection, and climate change adaptation) also function as project categories in the list. As such, they relate to initiatives that are more carefully intended to fulfil certain environmental requirements.

3.4. Process for Project Evaluation and Selection

The issuer of a Green Bond should clearly communicate to investors:

- The environmental sustainability objectives of the eligible Green Projects.
- The process by which the issuer determines how the projects fit within the eligible Green Projects categories, and Complementary information on processes by which the issuer identifies and manages perceived social and environmental risks associated with the relevant project(s).

Issuers are also encouraged to:

- Position the information communicated above within the context of the issuer's overarching objectives, strategy, policy and/or processes relating to environmental sustainability.
- Provide information, if relevant, on the alignment of projects with official or
- market-based taxonomies, related eligibility criteria, including if applicable, exclusion

criteria; and also disclose any green standards or certifications referenced in project selection.

- Have a process in place to identify mitigants to known material risks of negative social and/or environmental impacts from the relevant projects, Such mitigants may include clear and relevant trade-off analysis undertaken and monitoring required where the issuer assesses the potential risks to be meaningful.

3.5. Reporting:

Issuers shall make and retain easily available up-to-date information on the use of proceeds to be refreshed yearly until final allocation, including in the event of major events, on a timely basis. The yearly report should include a list of the projects that have received Green Bond revenues, as well as a brief explanation of the projects, the amounts granted, and the estimated impact. Where confidentiality agreements, competitive considerations, or many underlying projects limit the amount of detail that can be made available, the GBP recommends that information be presented in broad strokes or on an aggregated portfolio basis (e.g., percentage allocated to specific project categories). International Capital Market Association (ICMA). (2021). Green Bond Principles. Transparency is especially important when conveying the intended and/or accomplished effect of initiatives. The GBP suggests using qualitative performance indicators, as well as quantitative performance measurements and disclosure of the important underlying methodology and/or assumptions utilized in the quantitative calculation, when possible. Where feasible, issuers should refer to and use the advice and impact reporting templates given in the Harmonised Framework for Impact Reporting. (Banks & Gilchrist, 2019).

3.6. Motivations of green finance practice

As global and regional environmental rules become more stringent, there is a considerable increase in green finance practices and the use of green financial instruments as investors become more concerned about climate-related issues. The pressure on governments, in particular, Following the signing of the Paris Climate Agreement in 2015, financial institutions and corporations have increased their efforts to incorporate environmental protection and climate change mitigation (Tolliver, Keeley, & Managi, 2020). Global and regional organizations such as the United Nations, World Bank, International Monetary Fund (IMF), European Union, and the Group of 20 (G20) are putting pressure on their members and trading partners to implement green finance policies in their financial systems (Bhandary, Gallagher, & Zhang, 2021).

4. Literature Review:

4.1. Green Finance and Its Dimensions:

Since its introduction, GF has acquired substantial traction in the economic conversation among international organizations and state governments. This interest in GF has also grown

among academics, scholars, researchers, and practitioners, and it currently accounts for a new financial strategy emphasizing green investment to safeguard the environment while also promoting economic growth. GF is seen as a necessary component of sustainable banking, with a significant influence on the development of a sustainable economy and business in general. According to the European Commission, the concept of GF in financial services includes investment decisions that include environmental, social, and governance considerations to promote customer and societal satisfaction.

GF is a comprehensive method that combines various approaches for improving the economic, social, and environmental performance of the monetary system, which is measured using environmental, social, and governance (ESG) criteria, i.e., factors that are critical components of sustainable economic development and finance (Financing Sustainable Development: Key Challenges and Prospects, 2019). Green bonds, microfinancing, sustainable funds, impact investments, active ownership, loans for sustainable development, and more viable financial systems are among the key operations of GF. According to the EU high-level expert group on sustainable finance (2017), GF is a financial system that provides and addresses the challenges of sustainable development, sustainable housing, retirement, infrastructure, technological development, climate change mitigation, and other long-term educational and societal issues. (Brealey, Myers, & Allen, 2017)

According to the study, the "economic dimension" is the most significant dimension driving GF, followed by the "social" and "environmental" aspects. Rashid also investigated the influence of green financing by the financial and non-financial sectors on Egypt's overall economic development. The analysis indicated that the development trend of sustainable financial sector funding is minimal in comparison to total credit issued and stays below the Bangladesh Bank's benchmark. Although GF has enormous potential for Bangladesh's long-term economic development, financial institutions, including banks, have identified some of the major challenges of its practices, such as a lack of policy formulation, standardized reporting guidelines, incorporation of environmental issues, and so on (Hoai, 2015). Another research found that It was said that the Egyptian Bank's implementation of clear standards will result in the effective adoption of sustainable banking in Egyptian banks. The survey also indicated that slower technology advancement, financial product innovations, and a lack of social and ecological consciousness among the public in banking firms might all be barriers to green growth (Forum, 2017). As a result, GF may be considered to play a critical role in improving banks' sustainability performance through the financing of eco-friendly projects, as well as the attainment of the country's sustainable economic growth (Denis, 2005).

4.2. Sustainability Performance:

The term "sustainability" refers to the ability to maintain well-being over a lengthy, and perhaps infinite, period, and it primarily addresses the environmental element of the three pillars of sustainability. However, the words "environment" and "sustainability" are not interchangeable. Sustainability performance, on the other hand, refers to a firm's

performance in terms of sustainability across all elements and drivers of corporate sustainability. Furthermore, the term "corporate sustainability performance" refers to the environmental, social, and economic aspects of corporate governance in general and corporate sustainable management in particular. A corporation's sustainability plan is defined as a strategy aiming at long-term economic prosperity, ecological sustainability, and social stability for both the business and its members. More recently, Malsha et al. investigated the mediating role of employees' green behavior in the Sri Lankan banking sector's sustainability performance and discovered that green banking practices such as environmental policies, green financing, green products and services, and green process and procedures have positively influenced the banks' sustainability performance. The study also found that employees' green behavior moderated the association between green banking practices and bank sustainability performance. Bui et al., more recently, The study identified six major research gaps in the field of sustainable corporate finance and sustainability, such as sustainable competitive advantages, circular economy, sustainable corporate finance innovation and risk management, corporate finance in sustainability, and sustainable supply chain ethics, through a bibliometric systematic review. Increasing the sustainability orientation has shifted the attention of both academics and practitioners on corporate sustainability to sustainable finance. Corporate sustainability is described as a company's capacity to fulfill the demands of its current and indirect stakeholders while not jeopardizing the needs of future stakeholders. This term refers to the process of modifying an organization's business models to reconcile concerns about the three pillars of sustainability while growing long-term operations. Corporate sustainability in sustainable finance has the potential to deliver a wide range of competitive advantages and influence value creation in both the short and long term. Corporations with consistent environmental, social, and financial performance are believed to be able to realize cost savings, decreased litigation and regulatory risks, increased operational efficiency, and more stable financial community and stakeholder relations. As a result, sustainable performance might be described as the achievement of well-being by one entity, with the anxiety of future entities remaining. As a result, based on the above discussion and concept of green finance and sustainability performance adapted from existing literature, this study implements the three essential dimensions of GF as an independent variable and the sustainability performance of banks as the dependent variable to examine their relationship (Fama & French, 1992).

4.3. The Concept of Financial Sustainability Measurement:

In the final decade of the twentieth century, an extensive scientific debate on finance and sustainability began. Previous macro-level research on the relationship between finance and sustainability focused on issues such as developing financial policies and developing financial instruments to support sustainable development. An economic debate in this context centred on national financing frameworks that would integrate resources and actions to meet the priorities of national sustainability strategies. A set of financial measures to achieve national goals in the field of sustainable development should consider a region's level of

economic development and include instruments such as natural resource taxes, public and private investments, insurance schemes, and debt. Despite various interpretations, there have been numerous efforts to figure out how to measure whether a business is financially stable or viable. Many studies highlight the risk of bankruptcy, which means the ability to pay debts and handle day-to-day expenses, as a crucial indicator of a business's financial sustainability. This measure is important because it helps financial intermediaries assess if a company is creditworthy, helps shareholders decide on making new investments, and guides managers in making acquisitions. So, understanding the risk of bankruptcy is key to knowing how financially sustainable a company is. Researchers often focus on analyzing different aspects of financial risk and how they're connected, using traditional financial analysis tools (Narayana, 2014). For example, one researcher, Henock, used the ratio of financial revenue to operating expenses to explain the financial sustainability of cooperatives. He found that it depends a lot on factors like return on assets, efficiency in operations, the balance between debt and equity, donations, and how much money is collected from deposits. Another study by Schwab and team pointed out that for small and growing businesses in Switzerland, the risk of bankruptcy was a significant challenge. Managers had to pay attention to key performance indicators like how quickly customers paid their bills and the credit limit given by financial partners when planning their financial strategy. (Bank., 2020)

In general, many studies found that financially sustainable companies tend to have more cash on hand and less debt. These measures are directly related to how a company gets its money and how much it owes (Barberis & Thaler, 2003). However, the impact of some other financial factors, like how efficiently a company operates and its value in the market, on financial sustainability is still not very clear. Despite various interpretations, there have been numerous efforts to figure out how to measure whether a business is financially stable or viable. Many studies highlight the risk of bankruptcy (Gunter, 2003), which means the ability to pay debts and handle day-to-day expenses, as a crucial indicator of a business's financial sustainability (Denis, 2005). This measure is important because it helps financial intermediaries assess if a company is creditworthy, helps shareholders decide on making new investments, and guides managers in making acquisitions. So, understanding the risk of bankruptcy is key to knowing how financially sustainable a company is. Researchers often focus on analysing different aspects of financial risk and how they're connected, using traditional financial analysis tools. For example, one researcher, Henock, used the ratio of financial revenue to operating expenses to explain the financial sustainability of cooperatives. He found that it depends a lot on factors like return on assets, efficiency in operations, the balance between debt and equity, donations, and how much money is collected from deposits. Another study by Schwab and team pointed out that for small and growing businesses in Switzerland, the risk of bankruptcy was a significant challenge. Managers had to pay attention to key performance indicators like how quickly customers paid their bills and the credit limit given by financial partners when planning their financial strategy. In general, many studies found that financially sustainable companies tend to have more cash on hand

and less debt. These measures are directly related to how a company gets its money and how much owes it. However, the impact of some other financial factors, like how efficiently a company operates and its value in the market, on financial sustainability is still not very clear.

Most researchers agree that financial sustainability is a complex and multi-faceted concept connected to how profitable, solvent, and efficient a company is. Despite many attempts to indirectly understand financial sustainability, there hasn't been much research on how to evaluate it for individual companies. Recognizing this gap, our study aims to develop a method to measure financial sustainability, specifically focusing on food companies. We want to create a practical measure that can be used to evaluate how well food companies are managing their finances. Our approach is unique because we use a fuzzy membership function and aggregation technique to deal with the complexity of financial sustainability at the company level. We've built a theoretical framework to measure financial sustainability and analyzed factors that influence it, using a group of food companies from Northern Europe. Our method is consistent, allowing it to be used for large groups of similar entities, making it possible to compare companies, industries, and economies to assess their financial health. Ultimately, our proposed method can be a valuable tool for managers and other stakeholders in making better financial decisions for their businesses (Jha & Sharma, 2004).

4.4. Green Bond and Economic Growth:

The extensive research in the realm of sustainable finance and economics underscores the transformative potential of green bonds on the economic growth of countries that actively engage in their issuance. Countries with a robust portfolio of green bonds have been empirically proven to experience accelerated GDP growth compared to those with lower issuance levels (Kumar & Chaturvedi, 2020). Beyond the immediate economic gains, green bonds exhibit a lasting and multifaceted impact on both economic and social dimensions (Lichtenberger et al., 2022). One notable aspect of this impact is the contribution to long-term economic and social development. Green bonds serve as a critical financial instrument by providing additional funding for sustainable development projects, effectively reducing poverty and inequality—two pivotal factors that drive sustained economic growth (Blanchard et al., 2017). The implications extend to portfolio management, where green bonds act as stabilizers, enhancing overall economic stability through reduced volatility and improved Sharpe ratios (Lichtenberger, 2022). This stability becomes particularly valuable in safeguarding investments and portfolios against external fluctuations, such as those stemming from oil price volatility and business cycle dynamics.

Furthermore, green bonds emerge as an alternative avenue for funding risk-free securities, offering an attractive option that replaces high-interest debt schemes characterized by unpredictable equity expenses. This positioning makes green bonds a compelling financing instrument that not only fosters sustainable growth but also addresses financial considerations associated with traditional debt instruments (Maltais & Nykvist, 2019).

While the overall impact of green bonds on economic growth is evident, their influence is particularly pronounced in specific sectors. The energy and technology sectors have garnered considerable attention in connection with green bond issuances. Research by Karras et al. (2020) confirms a positive relationship between green bond issuances and increased private investment in the renewable energy sector, translating into a noteworthy boost in overall GDP growth. This aligns with arguments presented by Pindyck & Rubinfeld (2012), who contend that investments in clean technology have the potential to enhance productivity, contributing to sustained economic growth.

Moreover, the impact extends beyond the national GDP growth, influencing broader economic green growth. Green bonds facilitate funding and oversight of environmentally and growth-oriented dimensions, providing crucial support for economies striving to achieve and maintain sustainable growth (Ning et al., 2021). The employment rate in renewable energy sectors, including wind power and solar generation, experiences significant growth, underscoring the role of green bonds in driving job creation and economic development within specific sectors (Zhang et al., 2019).

Additionally, green bond issuances have been associated with increased foreign direct investments (FDI) in sectors related to green transition, such as clean technology industries encompassing electric vehicles and smart grids (Huang et al., 2018). This suggests that green bonds not only contribute to domestic economic expansion but also attract international investments, further enhancing their impact on economic growth.

In summary, the cumulative evidence underscores that green bonds play a pivotal role in shaping both the overall economic growth of nations and the development of specific sectors. From mitigating volatility to fostering sustainable growth, green bonds emerge as a versatile financial instrument with far-reaching implications for economic prosperity and environmental sustainability (Amankwah, 2018).

A recent study focused on understanding how green bonds impact Egypt's shift toward a greener economy on a national scale. The study looked at various indicators like GDP per capita, employment rates, poverty levels, and inflation. The findings revealed a substantial potential for Egypt's economy to transition to a greener model, especially with the notable increase in green investments, including green bonds. Interestingly, the study identified a potential factor hindering the issuance of green bonds—external financing. This factor seems to have an impact on both green bonds and Egypt's green economy (Mohamed et al., 2023).

Moving forward, we'll now delve into a more detailed examination at the company level. We'll explore the intricate connection between corporate green bond issuance and the specific outcomes associated with these green financial instruments.

5. Research Methodology & Design

5.1. Research Methodology

The use of a mixed-methods approach combining qualitative and quantitative analysis is critical to a thorough examination of Egypt's corporate green bond market. Because corporate green bond issuances are uncommon, a qualitative approach is required to comprehend the market's intricate dynamics, difficulties, and prospects. Through surveys and focus group discussions, qualitative approaches, recognized for their success in unearthing the "how" and "why" underlying phenomena, will enable the investigation of stakeholders' viewpoints. The incorporation of quantitative approaches, on the other hand, is critical for providing statistical validation, quantifying certain characteristics, and developing a more firm foundation for evidence-based conclusions. The combination of both methodologies ensures a comprehensive grasp of the research issue, combining the depth of qualitative insights with the statistical rigor of quantitative analysis, thereby increasing the legitimacy and application of the study's conclusions (Gunter, 2003).

5.2. Quantitative Research, Data Collection Methods:

We do questionnaire: Designing and distributing questionnaire to stakeholders to collect quantitative data on perceptions, preferences, and attitudes towards corporate green bond issuances. Distribution: The questionnaire will be sent to stakeholders identified through industrial networks, financial institutions, and relevant organizations via email. It will also be posted on social media channels to reach a larger audience.

5.3. Data Collection Technique : the questionnaire :

It is clear from the examination of the questionnaire responses from a sample of 200 participants that the method of data collection used in this study includes several important components. The distribution of answers across the questionnaire's parts sheds light on stakeholders' opinions, preferences, and perceptions of corporate green bonds in Egypt.

6. Findings and Conclusions

The study's research methodology employs a mixed-methods approach, combining qualitative and quantitative analyses to thoroughly investigate Egypt's corporate green bond market. Given the scarcity of corporate green bond issuances, a qualitative approach is required to fully comprehend the market's dynamics, challenges, and prospects. Qualitative methods, such as surveys and focus group discussions, are effective at eliciting stakeholders' perspectives and elucidating the "how" and "why" of phenomena. The incorporation of quantitative methods ensures statistical validation and a more solid foundation for evidence-based conclusions, as well as a thorough understanding of the research problem.

Surveys are used in the quantitative research component to collect data on stakeholders' perceptions, preferences, and attitudes toward corporate green bond issuances. To ensure a broad reach, the surveys will be distributed via email and social media channels to stakeholders identified through industrial networks, financial institutions, and relevant organizations.

A survey timeline is included in the research design, and it includes phases such as preparation, obtaining approvals and ethics, recruiting participants, distribution of surveys, data gathering, data analysis, reporting, validation, and review. This methodical approach lasts approximately 29 weeks, ensuring a methodical and staged survey execution.

In terms of ethics, the study prioritizes informed permission, anonymity, and secrecy. Participants will be thoroughly informed about the research's aims, possible hazards, and their rights, including corporate issuers, investors, financial analysts, policymakers, and environmental specialists. To guarantee participant comfort and honest input, anonymity and confidentiality will be preserved. The study staff will treat participants with dignity and respect, and a feedback system will be developed to address any issues.

Professionals and experts working in Egypt's financial and environmental sectors, with an emphasis on corporate issuers, investors, financial analysts, policymakers, and environmental specialists, comprise the study's population. Purposive sampling will be used to choose participants on the basis of their roles and experiences, assuring relevance to the study themes.

The quantitative research study comprises employment distribution, degrees of experience, company green bond knowledge, views of environmental sustainability contribution, and correlation analysis. Correlation analysis investigates links between variables such as green bond implementation methods and Vision 2030 goals, market views and investor confidence, regulatory frameworks, international cooperation, and other factors.

The study's population consists of professionals and experts working in Egypt's financial and environmental sectors, with a focus on corporate issuers, investors, financial analysts, policymakers, and environmental specialists. Purposive sampling will be utilized to choose participants based on their positions and experiences, ensuring that they are relevant to the study issues.

The quantitative research study includes employment distribution, experience levels, corporate green bond knowledge, perspectives on environmental sustainability contribution, and correlation analysis. Correlation analysis looks at the relationships between variables such as green bond implementation techniques and Vision 2030 targets, market perspectives and investor confidence, regulatory frameworks, international cooperation, and other issues.

The study used a mixed-methods approach, combining quantitative surveys with qualitative interviews. Purposive sampling was used to assure relevance among experts in Egypt's financial and environmental sectors. Ethical considerations place a premium on informed permission, anonymity, confidentiality, and participant respect. Quantitative study entails distribution and correlation studies, whilst qualitative analysis investigates themes in participants' comments, resulting in a full knowledge of stakeholders' viewpoints on corporate green bonds in Egypt.

7. Conclusion

Finally, the study of corporate green bonds in Egypt gives unique insights on the dynamics, difficulties, and opportunities of sustainable financing in the country. The study technique, which used a mixed-methods approach, allowed for a thorough investigation of the issue, combining quantitative and qualitative depth. Through surveys, interviews, and data analysis, a more sophisticated picture of corporate green bond perceptions and practices has evolved.

As discussed in earlier studies, the historical backdrop of Egypt's fiscal sustainability emphasizes the important relationship between budget deficits, government debt, and economic reforms. Understanding the context is critical for contextualizing present efforts in sustainable finance and comprehending the potential significance of green bonds in attaining larger economic objectives.

The survey of the literature highlighted the history of economic theory, with classical economists pushing for minimum state action and Keynesian economists highlighting the importance of government intervention, particularly during economic crises. The idea of fiscal sustainability has evolved as a result of economic theories and experiences. The current study supports the Keynesian viewpoint by recognizing the importance of the state in tackling economic difficulties, notably through instruments such as green bonds.

Other emerging nations' empirical research, such as India, Vietnam, and Ghana, demonstrated the variability of fiscal sustainability outcomes. While some nations demonstrated fiscal sustainability through co-integration of government sources and spending, others had difficulties, highlighting the importance of context-specific analysis. This variety contributes to Egypt's present understanding of fiscal sustainability and supports specialized approaches to sustainable financing.

A study of the Egyptian corporate green bond market demonstrated the need of a mixed-methods strategy. The quantitative survey provided statistical validation as well as insights into stakeholders' preferences and attitudes, whilst the qualitative interviews gave a more in-depth analysis of the "how" and "why" underlying occurrences. The combination of these approaches enhanced the study, adding to the credibility and applicability of its findings.

The poll results indicated an overall positive prognosis for the future of corporate green bonds in Egypt. Stakeholders, including issuers, investors, policymakers, and market experts, had various degrees of knowledge with green bonds, with a sizable number reporting a high level of familiarity. Financial rewards, environmental effect, transparency, and conformity to international standards were ranked as important variables affecting stakeholders' views and decisions.

Correlation analysis revealed high and moderate positive correlations between important variables, elucidating the links between them. These connections, such as the alignment of green bond implementation mechanisms with Vision 2030 objectives and the

good impact of international cooperation on issue mitigation, give useful insights for strategic planning and policy creation.

The value of transparency, the influence of experience on market views, the relationship between sustainability and financial performance, and the necessity of global standards emerged from qualitative data analysis. These themes enrich the quantitative findings by providing a comprehensive grasp of stakeholders' viewpoints on corporate green bonds.

The study's social change implications highlight the potential of sustainable financing, particularly corporate green bonds, to contribute to Egypt's larger socioeconomic and environmental goals. The research's favorable opinions and correlations indicate a basis for developing a more sustainable financial ecosystem. The findings might help politicians, financial institutions, and companies design policies that are in line with national development goals while also tackling global sustainability concerns.

Recommendations for future research seek to expand on the current study's basis by investigating longitudinal patterns, comparative analyses, and behavioral factors. Longitudinal studies may follow the changing impact of green bonds, while comparison analysis can provide best practices and contextual variations. Behavioral research can help us better understand the psychological aspects that influence long-term investing decisions, adding to the increasing body of knowledge in behavioral finance.

Finally, this study contributes to Egypt's expanding debate on sustainable finance. The study gives a sophisticated knowledge of stakeholders' perceptions on corporate green bonds by integrating quantitative and qualitative methodologies. The discovered connections, themes, and recommendations provide a framework for future study as well as practical implications for encouraging good social change through sustainable financial practices.

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