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Impact of Operational Efficiency, Market Value, and Sustainable Financial Growth on ESG Disclosure in Egyptian Banks

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Abstract

This research explores how different aspects of financial performance can influence Environmental, Social, and Governance (ESG) disclosure in the Egyptian banking sector, reversing the traditional focus on ESG's impact on financial outcomes. Using a sample of 25 banks—including listed Islamic, listed conventional, and unlisted conventional banks—over the period 2020–2024, the research examines the effects of operational efficiency, market value, and sustainable financial growth on ESG disclosure levels.

ESG disclosure was assessed using a composite index, while financial metrics such as cost-to-income ratio, asset utilization, Tobin's Q, book value of capital, sustainable growth rate, and financial sustainability ratio served as independent variables. Control variables included bank size, ROE, and loan-to-deposit ratio. Panel data regression analysis revealed a negative relationship between operational efficiency and ESG disclosure, suggesting efficient banks may prioritize cost control over non-financial reporting. Conversely, market value and sustainable financial growth showed positive effects on ESG disclosure, indicating that financially stronger banks are more likely to invest in transparent, ethical, and sustainable practices.

The research also found that listed conventional banks lead in environmental and social reporting, while unlisted banks focus more on governance disclosures. These insights offer valuable guidance for regulators, investors, and financial institutions seeking to integrate sustainability into their business strategies.

Keywords: Operational Efficiency; Market Value; Sustainable Financial Growth; Environmental, Social and Governance Disclosure; Egyptian Banks

1. Introduction

The term "ESG" was officially adopted in 2004 following its initial public appearance in a report named "Who Cares Wins." The paper outlined the three fundamental components of environmental, social and governance and provided examples of how to incorporate the three factors in businesses' operations which indicates the importance of ESG role in the world of business. More frameworks and guidelines were developed in the ensuing ten years, offering additional direction on how businesses might include and disclose ESG factors (Pollman, 2022).

In today's world, banks are distinctive. Although they are officially classified as commercial businesses, they actually play a government role by overseeing all financial activities for both individuals and organizations (Brudno & Arlazarov, 2023). As a result, banks are crucial to the development of economies and society. There is no denying that the banking industry is one of the most significant financial organizations that contributes significantly to the growth of the economy (Vunjak et al. 2020).

ESG are becoming more and more important to banks and other financial organizations. Due to their direct impact on economic stability, ESG issues are not simply moral but are also increasingly becoming economic in nature. Financial institutions may find it difficult to meet client and investor expectations regarding the inclusion of ESG aspects in their lending, investing, and product portfolios (Menicucci & Paolucci, 2023).

In Egypt, as a developing country, businesses were primarily concerned with making money. However, Egypt's corporate and financial sectors have been increasingly adopting ESG concepts due to the growing worldwide attention on sustainable growth and ethical business practices. In order to establish a broad framework for sustainable finance, the Central Bank of Egypt released the Guiding Principles on Sustainable Finance. This framework requires Egyptian banks to integrate ESG considerations into all loan advancement processes and decisions. It is important to note that these principles support and align with national and international commitments, such as Egypt Vision 2030 and the Sustainable Development Goals (SDGs), and they strengthen and supplement other development activities of the Central Bank of Egypt.

It is critical to correlate each bank's ESG score with its market value, efficiency, and sustainable performance. The contribution and integration in the ESG domains increase with market value. In actuality,

there is a dual interplay between ESG ratings and market value. On the one hand, a company's level of engagement with an ESG approach is determined by its market value. However, ESG plays a significant role in determining the bank's performance and its market value, and a losing bank is unable to allocate specific funds to sustainability-related concerns (Ersoy et al., 2022).

Same applied for the sustainable financial growth of the bank as its market value. In terms of the definition of sustainable finance, a bank with good sustainable finance and sustainable growth has an effective strategy that may be utilized to turn present risks into opportunities in order to generate balanced economic growth (Oprean-Stan et al., 2020).

Considering the impact of banks on developing economies and examining the ESG practices and performance of Egyptian banks, it was observed that only two banks from the private sector have made notable strides in adopting sustainability practices, while no public or Islamic banks demonstrated significant implementation in Egypt. Additionally, the findings indicated that nine banks achieved a score above zero, attributed to the initiatives of the Central Bank of Egypt, which has been providing low-interest loans to support small startup businesses. Furthermore, it was determined that there is no significant difference in the sustainability banking performance scores among public, private, and Islamic banks in Egypt. Lastly, no significant correlation was found between the size of the banks and their sustainability adoption scores in Egypt (Dawood & Eldahan, 2020).

In continuation of existing scientific research on sustainability and financial performance, this study seeks to further explore and deepen the understanding of the relationship between ESG disclosures and various dimensions of financial performance within the Egyptian banking sector. As Egypt represents an emerging market with evolving regulatory frameworks and growing investor interest in responsible banking practices, this research aims to provide valuable insights into how operational efficiency, market valuation, and sustainable growth contribute to the extent and quality of ESG reporting. By focusing on the Egyptian context, the study adds a new perspective to global ESG literature, particularly in regions where the integration of non-financial reporting is still developing.

2. Literature Review

2.1 Operational Efficiency and Environmental, Social, Governance Disclosure

In a business environment, operational efficiency is characterized as the relationship between the outputs produced by the business and the inputs required to conduct its operations. Enhancing operational efficiency leads to an improved output-to-input ratio. This efficiency is typically attained by optimizing a company's fundamental processes to better adapt to the ever-evolving market dynamics in a cost-effective way (Hillier, 2024).

The benefits of corporate ESG investments on operational performance are clearly not readily reflected in performance-related variables or indicators, according to prior research on the influence of ESG on the operational efficiency of various organizations. Jung & Yoo (2023) also noted that businesses may neglect to use ESG in a competitive market, leading to a negligible correlation between ESG and performance. This implies that the relationship between ESG and operational efficiency may differ depending on the kind of business, the market and economy in which the business operates, and the impact that each ESG dimension has on the operational performance and efficiency of each business.

As a bank improves its efficiency, it can boost its competitiveness, enhance profits, raise market prices, and increase investor trust. It is considered that both specific internal and external elements play a role in this inclination. Banking firms employ a standardized measure to assess their operational efficiency, which indicates their ability to control expenses, produce operational income, and uphold market prices (Hughes & Mester, 2012). The importance of capital allocation is heightened in emerging and developing economies. The effective distribution of capital by banks relies on their operational efficiency (Khan, 2022).

The level of an organization's ESG significantly influences its operational efficiency (Aroul et al., 2022). Organizations that excel in ESG performance enjoy enhanced human capital, superior management capabilities, and advanced technological resources that contribute to improved operational efficiency. By enhancing their ESG performance, companies can attract higher-quality human capital (Jun et al., 2022). Providing better employee treatment and fostering a supportive work environment motivates staff and strengthens their

connection to the organization. Consequently, enterprises with elevated ESG standards exhibit more robust management capabilities. Effective corporate governance reduces agency issues by promoting greater diligence and accountability among managers (Gao et al., 2021).

An investigation into the relationship between Environmental Social Governance (ESG) disclosure and the operational, financial, and market performance of Indian companies revealed that ESG initiatives positively influence firms once a certain threshold is achieved, necessitating long-term planning and significant resource allocation. The ESG score has been divided into three components: Environmental Disclosure Score (EDS), Social Disclosure Score (SDS), and Governance Disclosure Score (GDS). This study analyzed a sample of 305 companies listed on the NSE 500, India's largest stock exchange, examining both linear and non-linear relationships among the variables. The data spans from 2014 to 2022, coinciding with the Indian government's implementation of the CSR mandate in 2014. The linear results derived from dynamic panel data analysis suggest that increased engagement in social initiatives and effective governance correlate with enhanced operational efficiency, as indicated by the return on assets (ROA) metric, which reflects corporate operational performance (Agarwala, 2024).

Anis et al. (2023) introduced a sustainability governance (SGOV) model and index to measure the spread of sustainability innovation. The research examined the impact of the SGOV index on profitability, with operational efficiency acting as a mediator. Analysis of annual and sustainability reports from Indonesian banks from 2010 to 2020 showed an increase in the SGOV index. Banks showed lower innovation in sustainability motivation, business cases, accountability, and communication, but moderate stakeholder engagement, organizational alignment, and risk management processes. The SGOV index negatively impacted bank profitability, with operational efficiency acting as a positive mediator. The study found that greater sustainability efforts correlate with reduced operational efficiency.

Better reporting disclosure will result in a higher ESG score, which will raise companies' ROA. According to another study, operational performance as measured by ROA is related to ESG performance, which is explained by the disclosure of sustainability reports (Buallay 2019).

Numerous prior studies have indicated that ESG initiatives positively influence corporate value and financial performance. Consequently, it was anticipated that these initiatives would enhance

efficiency; however, a negative impact of ESG has been observed (Yoon & Chun, 2022).

Van Staden (2015) showed a negative correlation between environmental disclosures in annual reports and economic performance as measured by return on assets (ROA), which many other authors utilized as a proxy for efficiency.

Azmi et al. (2021) looked at the ways that ESG activity affects bank value and discovered that it has a favorable correlation with efficiency and cash flows. They discovered that while ESG engagement has no influence on the cost of debt, it has a negative impact on the cost of equity.

On the other hand, organizations that operate efficiently possess additional resources that can be allocated to ESG initiatives, which is increasingly vital for institutions seeking to establish a competitive edge (Hofer et al., 2012). This surplus enables efficient entities to better navigate the unpredictable financial outcomes linked to ESG initiatives (Hardcopf et al., 2019). Consequently, it is reasonable to propose that enterprises with operational efficiency are more inclined to embrace these practices.

Based on the previous illustrated literature, the researcher formed the following hypothesis:

H1. There is a statistical association between bank operational efficiency and environmental, social, and governance disclosure.

2.2 Market Value and Environmental, Social, Governance Disclosure

The performance of ESG factors contributes to enhanced profitability and market valuation by facilitating (a) reduced explicit costs (such as potential fines and taxes), (b) improved operational efficiency (Brammer & Millington, 2005; Porter, 2002), (c) increased employee productivity and a wider consumer base, (d) a strengthened corporate reputation (Dhaliwal et al., 2012), and (e) heightened competitiveness through superior products and processes that dynamically generate profits (Lundgren & Marklund, 2015).

Consequently, as the ESG practices of organizations lead to the equitable distribution of outcomes among shareholders and all stakeholders, they contribute to the promotion of sustainable corporate growth and financial performance, thereby establishing a direct correlation between ESG practices and corporate financial performance (Shirasu & Kawakita, 2021).

According to stakeholder and legitimacy theory, socially responsible investments made by banks have a beneficial effect on their overall performance. Furthermore, stakeholder and resource-based theories indicate that investments in environmental initiatives also yield positive outcomes. Agency theory posits that enhanced corporate governance can lead to improved performance in banks, as the banking sector requires better governance disclosures to mitigate conflicts of interest between managers and shareholders, thereby addressing the agency problem (El Khoury et al., 2023). Additionally, it was suggested that the long-term costs associated with ESG investments may outweigh their benefits, potentially altering the influence of ESG activities on the market performance of banks.

Prior research suggests that accounting data alone fails to adequately account for an organization's market value (Hassel et al., 2005; Miralles-Quirós et al., 2019). Therefore, the influence of non-financial factors on a firm's valuation has emerged as a significant subject of discussion within academic circles (Manita et al., 2018).

According to research by Aboud & Diab (2018), enterprises that are part of the ESG Index have higher enterprise value, and a firm's worth as determined by Tobin's Q positively correlates with its higher ranking in the index. Additionally, they discovered that companies that are included on the ESG index are worth more than those that are not. In the Egyptian context, the study looked at how ESG disclosures affected corporate value between 2007 and 2016. The economic advantages linked to ESG disclosures are usually supported by these data. Additionally, the study by Wong et al. (2021) demonstrated that ESG certification can raise Tobin's Q considerably and lower the cost of financing.

According to a study by Abdi et al. (2022), there is a favorable correlation between market performance and ESG performance. This is demonstrated by the increase in cash flow that the company's sustainable development initiatives, such as its CSR or sustainability reports, have produced, which has led to a greater market value.

A review of research on the banking sector indicates that corporate social performance has a beneficial impact on the financial outcomes of banks, as demonstrated by Wu & Shen (2013) in their analysis of 162 banks across 22 nations. Additionally, Siueia et al. (2019) noted a positive influence of CSR on financial performance within the banking industry of Sub-Saharan Africa.

Furthermore, Simpson & Kohers (2002) established a positive correlation between a bank's social performance and its return on

assets. Conversely, Soana (2011) found no substantial evidence linking CSR to financial performance in the Italian banking sector.

Carnevale & Mazzuca (2014) examined the correlation between sustainability reports and bank valuation within European stock markets, revealing a detrimental effect on stock prices and an insignificant influence on earnings per share. In contrast, Bolton (2013) identified a positive association between corporate social responsibility (CSR) and bank value, as indicated by Tobin's Q in the US banking sector.

Furthermore, Peni & Vahamaa (2012) discovered that banks with more robust corporate governance frameworks exhibited greater profitability in 2008, alongside lower Tobin's Q and stock returns during the financial crisis (2008–2009), but experienced improved stock returns in the aftermath of the crisis, based on a study of large publicly traded banks in the United States. Brogi & Lagasio (2019), also, illustrated a positive correlation between ESG and ROA within a sample of US banks.

Nevertheless, sociopolitical theories predict that ESG performance practices will have a negative impact on stock prices because they are seen as a component of the social and political pressures that firms face, even though the majority of studies showed a positive and significant relationship between ESG factors and enterprises' market value (Reverte, 2016).

Brown et al. (2006) made the case that managers might use corporate funds to pursue ESG initiatives and gain personal advantages. According to Barnea & Rubin (2010), managers would overspend on ESG-related initiatives in order to enhance their reputation at the expense of shareholders.

According to Garcia et al. (2017), there is a negative correlation between enterprise asset profitability and ESG, and businesses with the best ESG performance typically have lower profits.

ESG has a negative impact on business earnings management, according to Velte (2020). Also, Duque-Grisales & Aguilera-Caracuel (2021) discovered a statistically significant negative link between the ESG score and the financial success of multinational listed firms in Latin American emerging markets.

Many prior investigations into the influence of ESG on the valuation and performance of banks have presumed a linear relationship. Some of these investigations indicated a positive impact of environmental, social, and governance performance, while others found it to be negative or neutral.

According to agency theory, a successful outcome enables the business to improve its governance procedures, including the effectiveness of internal controls, the independence of the directors' board, and the audit and risk committee. Absolutely, it protects minority owners' rights, increases managerial control, reduces conflicts of interest between shareholders and managers, improves financial reporting, and establishes an effective and long-lasting value-creation process that benefits all parties involved. The institution's governance score is raised by such actions. Nevertheless, when the organization accounts for losses, the investments in the ESG field will be reduced or canceled, and the priority will go to the loss's compensation (Setiadi & Suhardjanto, 2017).

Based on the previous illustrated literature, the researcher formed the following hypothesis:

H2. There is a statistical association between bank market value and environmental, social, and governance disclosure.

2.3 Sustainable Financial Growth and Environmental, Social, Governance Disclosure

Over the past six years, business sustainability research trends have led to the integration of social-environmental and sustainability approaches to corporate performance (Alshehhi et al., 2018). Numerous issues in financial management arise when the financial sustainability mechanism is not in place. According to Brooks et al. (2018), the success of financial management is thought to have a significant impact on a company's potential for future growth and market promotion in addition to the efficacy of its financial and economic operations. The required collection of cycles, structures, units, and procedures must make up the financial function of the financial sustainability and management process. Basically, sustainable growth is the amount of expansion that a business can endure without experiencing issues. If a company expands too quickly, it could be hard to finance the expansion. A company may stagnate if it grows too slowly or not at all.

Concurrently, there is increasing demand from stakeholders to prioritize business performance beyond mere financial metrics. In response to these challenges, financial institutions have adopted sustainability strategies that include the publication of ESG reports (AlJaberi & Nobanee, 2021).

The sustainable finance strategies of banks influence their asset quality and capital adequacy. Liu & Huang (2022) posited a positive

correlation between a bank's ESG initiatives and its overall financial performance, as indicated by the CAMELS framework, which encompasses capital adequacy, asset quality, management efficiency, liquidity, and sensitivity to market conditions. This conclusion was derived from a study of fifteen Chinese banks conducted from 2008 to 2019, utilizing an autoregressive model that demonstrated banks' ESG activities impact their performance within a single year, while an inverse relationship is observed with a three-year delay.

In support of this claim, Berger et al. (2017) discovered a noteworthy positive correlation between the European banks' ESG scores and their Z-score, which gauges how well-capitalized they are with respect to return degradation The lower earnings volatility of the banks exhibiting sufficient ESG activities justifies this association. Therefore, by evaluating how a bank handles environmental, social, and governance concerns, sustainable finance helps to improve the prediction of a bank's performance.

The impact of sustainable finance on the returns of banks with headquarters in emerging economies is evaluated by Azmi et al. (2021), in line with Buallay (2019). They find that ESG has a significant positive impact on TQ and interest margins and that banks with better sustainable performance have more diverse access to funding, including funding sources associated with responsible banking disciplines.

Aydoğmuş et al. (2022) confirm this finding, pointing out that the relationship between ESG and value creation is nonlinear since the incremental advantage to firms' returns decreases as ESG performance rises. Furthermore, their research supports this association by using a different model that finds a positive correlation between banks' net interest margin (NII) and their ESG score, which explains why sustainable financing creates more value.

According to Aluchna et al. (2022), ESG disclosure is a response to stakeholder expectations and helps businesses win over important stakeholders. This can foster a positive work environment for internal staff, which will draw and keep talented workers who can contribute more to the growth of the company when they have a greater say in business decisions (Mao & Weathers, 2019).

In order to investigate the connection between ESG disclosure and sustainable advancement, Dai et al. (2024) examined a cohort of Chinese A-share listed businesses from 2013 to 2023. The results of the study indicate that ESG disclosure can support companies' long-term, steady growth. In addition to confirming the influence of ESG disclosure on transmission, more research has been presented to investigate

unforeseen consequences of ESG disclosures in sustainable development. The quantile regression study revealed a favorable relationship between the firm's sustainable growth rate and the degree of ESG transparency.

This is in line with the findings of Teng et al. (2021), which indicate that ESG considerations have a greater impact on high sustainable growth rates than they do on lower quantiles. This result is consistent with other studies that show that revealing sustainability data improves transparency, strengthens a company's brand, and increases employee loyalty and motivation.

In general, as ESG practices increase banks' capitalization, financial stability, and profit stability, this also extends to the macro level, where the large banks' low vulnerability increases the financial sector's overall capacity to cope with external shocks, thereby bolstering the economy's ability to recover.

In their study "Sustainability and Bank Risk" (Scholtens & Klooster, 2019), they examined how banks' ESG scores affect their insolvency and how banks with higher ESG scores lower systemic risk by using "SRISK" as a performance variable that predicts the mean capital erosion in times of crisis. According to a study done on European banks between 2002 and 2016, systemic degradation is accelerated by banks with low ESG profiles.

Every coin has two sides, of course, and ESG disclosures can also impede sustainable growth by raising operating costs, dedicated charges, and the appearance of "greenwashing." Strategic use of an enterprise's public information might negatively affect its business performance; this is referred to as "proprietary cost." The organization's competitive edge is weakened, and its ability to grow sustainably is impeded by competitors' ability to view and use the information that has been exposed (Lee, 2020; Weber, 2014).

Additionally, Chai et al. (2023) argue that building trust with stakeholders is the main goal of corporate transparency, not a genuine desire to benefit society. Furthermore, enterprise's intentional sharing of information about their social and environmental responsibility raises questions about the completeness and reliability of their disclosure (Higgins et al., 2018; Ng et al., 2023).

As a result, ESG disclosure may come seen as "greenwashing." Using "greenwashing" techniques over time entails putting inconsistent management techniques into practice, which might eventually prevent businesses from successfully competing in terms of long-term value. In particular, the financial market will react quickly to the disclosure of

dishonest environmental practices, or "greenwashing," which will lower stock prices and reduce the company's overall worth (Sun et al., 2023).

Maximizing shareholder wealth and achieving sustainable corporate growth are the ultimate goals of business development. The previous research studies examined the potential effects of sustainability reporting and ESG disclosure on the long-term viability of the business. It is necessary to investigate whether and how sustainable growth influences ESG disclosure in order to complete the research gap.

Based on the previous illustrated literature, the researcher formed the following hypothesis:

H3. There is a positive association between bank sustainable financial growth and environmental, social, and governance disclosure.

3. Research Problem

Business executives are beginning to understand that, in addition to managing their financial resources well, they also need to take steps to become more responsible, accountable, and transparent to the public, as well as internally. This is known as governance. Additionally, it describes how non-financial factors are incorporated into corporate decision-making and business strategy. Despite being regarded as non-financial, ESG variables have financial consequences because they affect a company's capacity to compete and make money (Gutiérrez-Ponce & Wibowo, 2023).

Latest research has discussed that there is a positive impact on corporates and banks' performance from their ESG practices. Businesses' efforts to disclose their non-financial information get the reward in terms of good reputation, high market value or firm value, stakeholders' confidence, and gathering investors.

But what if the opposite is true? There is limited research that tests the impact of a business's performance and financial position on its ESG disclosures and practices. Little is known about how financial performance can improve ESG practices.

This research is looking forward to filling the gap of research in this part and investigating the impact of banks operational efficiency, market value, and sustainable financial growth on the environmental, social, and governance disclosures and practices.

4. Research Objectives and Questions

The research aims to investigate the relationship between operational efficiency, market value, sustainable financial growth and ESG disclosures and practices in conventional and Islamic banks listed in the Egyptian Stock Exchange Market and other non-listed Egyptian conventional and Islamic banks from 2020 to 2024.

The primary three main objectives of this research are as follows:

1. **Examining the effect of bank operational efficiency on environmental, social, and governance disclosure.**
2. **Examining the effect of bank market value on environmental, social, and governance disclosure.**
3. **Examining the effect of bank sustainable financial growth on environmental, social, and governance disclosure.**

The research findings could answer the following three main questions:

RQ1: **What is the impact of operational efficiency on environmental, social, and governance disclosure?**

RQ2: **What is the impact of market value on environmental, social, and governance disclosure?**

RQ3: **What is the impact of bank sustainable financial growth on environmental, social, and governance disclosure?**

5. Research Theoretical Framework

Sustainability has gained significant attention from academics and practitioners globally in recent years, becoming a focus point in corporate governance and financial reporting. ESG practices are included in sustainability disclosure, which is now essential to improving corporate accountability and transparency. The change in mindset is a result of the increasing acceptance that sustainable business practices support organizational stability as well as long-term financial performance. The relationship between financial success and sustainability disclosure is crucial in the current investing environment, as institutional investors give ESG factors top priority when making decisions.

In the research framework presented in Figure (1), three research hypotheses are examined to show the impact of the three main

independent variables—namely operational efficiency, market value, and sustainable financial growth —on the dependent variable, ESG disclosure.

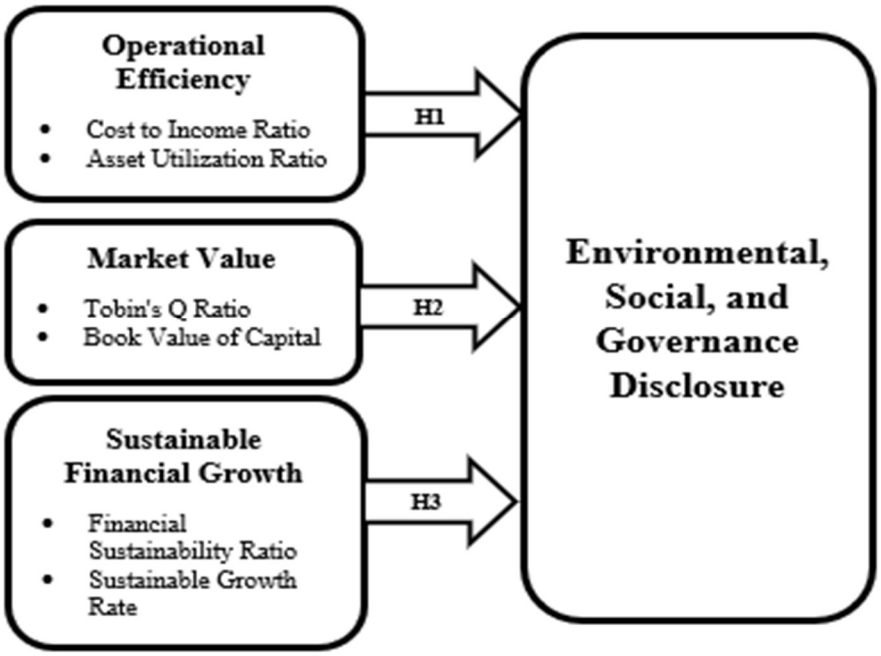


Figure (1) Research Theoretical Framework

6. Research Methodology

6.1 Research Population and Sample

The 36 banks that operate in Egypt under the CBE's supervision make up the study population. A total of 125 observations is included in the sample, which spans five years, from 2020 to 2024, and comprises 25 banks. Because of their different operational conditions and regulatory frameworks, nonfinancial sectors are not included in the focus, which is exclusively on the financial sector.

The chosen sample size and time frame guarantee a thorough study while preserving the research's viability. The research sample of the selected banks is shown in Table (1).

Table (1) The Research Selected Sample

Listed / Unlisted	No.	Bank Name	Percentage
Listed Islamic Banks	1	Faisal Islami Bank	16%
	2	Abu Dhabi Islamic Bank	
	3	Egyptian Gulf Bank	
	4	Al Baraka Bank	
Listed Conventional Banks	5	Suez Cana Bank	32%
	6	Qatar National Bank (QNB)	
	7	Housing & Development Bank	
	8	United Bank	
	9	Export Development Bank	
	10	National Bank of Kuwait	
	11	Commercial International Bank (CIB)	
	12	Credit Agricole	
Unlisted Conventional Banks	13	Banque Misr	52%
	14	National Bank of Egypt	
	15	Banque Du Caire	
	16	Bank of Alexandria	
	17	Attijariwafa Bank Egypt S.A.E	
	18	Emirates National Bank of Dubai	
	19	Arab Investment Bank	
	20	First Abu Dhabi Bank – Misr	
	21	Abu Dhabi Commercial Bank Egypt	
	22	Arab African International Bank	
	23	HSBC Bank Egypt	
	24	Arab Bank PLC	
	25	Mashreq Bank	
Total		25	100%

6.2 Data Collection

Between 2020 and 2024, the research sample includes 25 conventional and Islamic banks that operate in Egypt, 12 of which are listed in the Egyptian Stock Exchange and 13 of which are not. The researcher gathered the necessary data by looking at the annual reports, financial statements, and sustainability reports of the banks in the sample. The reports were collected through the Egyptian Stock Exchange and bank websites, which served as the main data sources for the analysis. In addition to using the CBE website to identify the banks that are under its supervision in Egypt.

6.3 Regression Models

6.3.1 First Regression Model, Adopted to Investigate the Impact of Bank Operational Efficiency on ESG Disclosure

H1. There is a statistical association between bank operational efficiency and environmental, social, and governance disclosure.
To test the first hypothesis, the following regression model was stated:

$$ESGD_{t+1} = f\,(OE_t, Controls)$$

$$ESGD_{it} = \alpha + \beta_1\, CIR_{it} + \beta_2\, AU_{it} + \beta_3\, BS_{it} + \beta_4\, PROF_{it} + \beta_5\, LIQ_{it} + \varepsilon_{it}$$

Where,

α = Constant of the regression model

ESGD = Dependent variable: Environmental, social, and governance disclosure of the bank (i) within the time period (t)

β_1 = Independent variable: Operational efficiency (OE) of the bank (i) within the time period (t) measured by cost to income ratio (CIR)

β_2 = Independent variable: Operational efficiency (OE) of the bank (i) within the time period (t) measured by asset utilization ratio (AU)

β_3 = Control variable: Bank size (BS) of the bank (i) within the time period (t)

β_4 = Control variable: Profitability of the bank (i) within the time period (t) measured by return to equity (ROE)

β_5 = Control variable: Liquidity of the bank (i) within the time period (t) measured by loan to deposit ratio (LDR)

It = Bank i - time t.

ε_{it} = Error term

6.3.2 Second Regression Model, Adopted to Investigate the Impact of Bank Market Value on ESG Disclosure

H2. There is a statistical association between bank market value and environmental, social, and governance disclosure.
To test the second hypothesis, the following regression model was stated:

$$ESGD_{t+1} = f\,(MV_t, Controls)$$

$$ESGD_{it} = \alpha + \beta_1\, TQ_{it} + + \beta_2\, BV_{it} + \beta_3\, BS_{it} + \beta_4\, PROF_{it} + \beta_5\, LIQ_{it} + \varepsilon_{it}$$

Where,

α = Constant of the regression model

ESGD = Dependent variable: Environmental, social, and governance disclosure of the bank (i) within the time period (t)

β_1 = Independent variable: Market value (MV) of the bank (i) within the time period (t) measured by Tobin's Q ratio (TQ)

β_2 = Independent variable: Market value (MV) of the bank (i) within the time period (t) measured by book value of capital (BV)

β_3 = Control variable: Bank size (BS) of the bank (i) within the time period (t)

β_4 = Control variable: Profitability of the bank (i) within the time period (t) measured by return to equity (ROE)

β_5 = Control variable: Liquidity of the bank (i) within the time period (t) measured by loan to deposit ratio (LTD)

It = Bank i - time t.

ε_{it} = Error term

6.3.3 Third Regression Model, Adopted to Investigate the Impact of Bank Sustainable Financial Growth on ESG Disclosure

H3. There is a statistical association between bank sustainable financial growth and environmental, social, and governance disclosure.
To test the third hypothesis, the following regression model was stated:

$$ESGD_{t+1} = f\,p(SFG_t, Controls)$$

$$ESGD_{it} = \alpha + \beta_1 FSR_{it} + \beta_2 SGR_{it} + \beta_3 BS_{it} + \beta_4 PROF_{it} + \beta_5 LIQ_{it} + \varepsilon_{it}$$

Where,

α = Constant of the regression model

ESGD = Dependent variable: Environmental, social, and governance disclosure of the bank (i) within the time period (t)

β_1 = Independent variable: Sustainable financial growth (SFG) of the bank (i) within the time period (t) measured by financial sustainability ratio (FSR)

β_2 = Independent variable: Sustainable financial growth (SFG) of the bank (i) within the time period (t) measured by sustainable growth rate (SGR)

β_3 = Control variable: Bank size (BS) of the bank (i) within the time period (t)

β_4 = Control variable: Profitability of the bank (i) within the time period (t) measured by return to equity (ROE)

β_5 = Control variable: Liquidity of the bank (i) within the time period (t) measured by loan to deposit ratio (LDR)

It = Bank i - time t.

ε_{it} = Error term

6.4 Variables Definition and Measurement

Table (2) displays the definitions and measurements of the dependent, independent, and control variables for the three panel regression models.

Table (2) Definitions and Measurements of Research Variables

Variables			Definition	Measurement
Dependent Variable	Environmental, Social, and Governance Disclosure	(ESGD)		Index

Independent Variables	Operational Efficiency	Cost to Income Ratio (CIR)	The level of a bank's efficiency and capability in conducting operations activities.	Operating costs divided by operating income
		Asset Utilization Ratio (AU)	The bank's ability to profit from all its assets that reduce expenses related to asset financing.	Turnover of assets divided by the total portfolio of assets.
	Market Value	Tobin's Q (TQ)	It's essentially a measure of how much the market values a bank relative to the cost of replicating its assets (market performance).	Sum of the market value of equity and total book value of liabilities, divided by total book value of assets. The market value of equity is calculated as the total number of outstanding shares multiplied by year-end closing price.
		Book Value of Capital (BV)	The money a bank raises by issuing common or preferred stock.	Value of capital per share as shown in each bank's balance sheet. The bank book value of capital ratio, often referred to as the Tier 1 Capital Ratio or Capital

				Adequacy Ratio (CAR), is a measure of a bank's financial health, indicating its ability to absorb losses. It's calculated by dividing a bank's Tier 1 capital by its total risk-weighted assets.
	Sustainable Financial Growth	**Financial Sustainability Ratio (FSR)**	**It refers to the level of bank's sustainability from the perspective of its financial performance.**	**Total financial income divided by total financial expense multiplied by 100.**
		Financial Sustainability Ratio (FSR)	**It refers to the level of bank's sustainability from the perspective of its financial performance.**	**Total financial income divided by total financial expense multiplied by 100.**
Control Variables	**Bank Size**	**Bank Size (BS)**	**Represents a measure of the size of banks, in terms of total assets.**	**Natural log of the bank's total revenue.**
	Bank Liquidity	**Loan to Debt Ratio (LDR)**	**The proportion of loans that are funded by Deposits**	**Net loans divided by total deposits.**
	Bank Profitability	**Return on Equity (ROE)**	**It is a profitability ratio that depicts how well the bank makes profits from equity capital.**	**Net income after taxes divided by average total equity.**

6.5 Environmental, Social, and Governance Disclosure Index

In this research, the researcher used an ESGD index, which is defined as a dummy variable that equals one when the company makes ESG disclosure and zero otherwise. ESGD score based on 50 indicators of ESG parameters. The environmental aspect score is based on 16 indicators of three environmental parameters, the social aspect score is based on 18 indicators of three social parameters, and the governance aspect score is based on 16 indicators of three governance parameters, as shown in Table (3).

- **The environmental pillar score (E): It gauges how a bank affects entire ecosystems such as the air, land, and water. Resource utilization, emissions and trash reduction, and environmental innovation are all tied to this index. Three dimensions are included in this index: climate change strategy, resource management (operations), and green finance & products.**
- **The social pillar score (S): It gauges how well a business can inspire loyalty and trust among its clients, employees, and the general public. Also, it measures the bank's impact on and responsibility towards the society where it operates (CSR). Three dimensions are included in this index: employee & customer well-being, diversity, equity & financial inclusion, and responsible bank practices & community investment.**
- **The governance pillar score (G): It assesses a bank's procedures and systems to make sure that board members behave in the shareholders' best interests. The three dimensions of the index are: board structure & independence, shareholder rights & transparency, and risk management & compliance**

Disclosure can be found in annual reports, sustainability/ESG reports, integrated reports, or dedicated sections on the bank website. The index uses a common approach found in research: an unweighted disclosure index where each item scores 1 if disclosed and 0 if not disclosed. The total score (and sub-scores for E, S, and G) can then be calculated as the sum of scores, often expressed as a percentage of the maximum possible score.

The overall ESG disclosure composite score for each bank was then computed as the mean score across the three pillars and computed as follows:

$$ESGD\ score = \frac{E + S + G}{3} \times 100$$

Where,

E: Environmental pillar score, S: Social pillar score and G: Governance pillar score.

Table (3) Environmental, Social, and Governance Disclosure Index

Category	Aspect	No.	Do the reports contain information on Items (Total 50)
Category A Disclosure of Environmental Issues	E1: Climate Change Strategy	1	Presence of a formal environmental policy or strategy.
		2	Disclosure of identified climate-related opportunities and a governance structure over them.
		3	Disclosure of GHG emission reduction targets.
		4	Training programs for employees on environmental issues.
		5	Disclosure aligning with TCFD (Task Force on Climate-related Financial Disclosures) recommendations.
		6	Programs aimed at reducing emissions.
		7	Long-term strategies to address climate change
	E2: Resource Management (Operations)	1	Total water consumption.
		2	Total waste produced and its management.
		3	Details of recycling initiatives.
		4	Measures taken to control pollution.
		5	Disclosure of energy consumption data or intensity.
	E3: Green Finance Products	1	Disclosure of policies related to environmental criteria in lending or investment decisions (e.g., sector exclusions, ESG integration).
		2	Disclosure of specific green financial products/services offered to customers (e.g., green mortgages, ESG funds).
		3	Disclosure of engagement with clients on environmental matters.

		4	Disclosure of the volume or value of green loans/financing provided (e.g., renewable energy projects).
Category B Disclosure of Social Responsibility	S1: Employee & Customer Well-being	1	Disclosure of employee health and safety policies or performance data (e.g., accident rates).
		2	Disclosure of employee benefits or well-being programs (beyond legal requirements).
		3	Disclosure of mechanisms for employee feedback or engagement (e.g., surveys, unions).
		4	Disclosure of policies or practices related to responsible lending/selling (product safety and compliance).
		5	Disclosure of mechanisms for handling customer complaints.
		6	Disclosure of accessibility of services for vulnerable or disabled customers.
		7	Programs for employee skill development.
		8	Employee turnover rates.
	S2: Diversity, Equity & Financial Inclusion	1	Disclosure of workforce diversity data (e.g., gender, ethnicity) – potentially broken down by management level.
		2	Disclosure of gender pay gap information.
		3	Disclosure of data on serving low-income or unbanked/underbanked customers.
		4	Disclosure of a DEI policy or commitment statement.
	S3: Responsible Bank Practices & Community Investment	1	Disclosure of community investment, donations, or corporate social responsibility (CSR) spending.
		2	Disclosure of employee volunteering programs or hours.
		3	Disclosure of social criteria in lending or investment decisions (e.g., supporting social enterprises).
		4	Disclosure related to human rights policy or due diligence, particularly in supply chain or financing.

		5	Disclosure of policies/procedures on anti-money laundering (AML) and combating financing of terrorism (CFT) (beyond basic regulatory statements, e.g., training, risk assessment).
		6	Publication of social impact assessments.
Category C Disclosure of Governance	G1: Board Structure & Independence	1	Disclosure of board size and structure.
		2	Disclosure of separation of CEO and Chairman roles (or justification if combined).
		3	Disclosure of existence of specialized board committees.
		4	Disclosure of remuneration policy for board members and executives and whether it's linked to ESG performance targets.
	G2: Shareholder Rights & Transparency	1	Disclosure of policies related to shareholder rights
		2	Disclosure of engagement activities with shareholders/stakeholders on ESG topics.
		3	Policies managing conflicts of interest.
		4	Communication channels with stakeholders.
		5	Transparency in financial and operational disclosures.
		6	Regular publication of governance reports.
	G3: Risk Management & Compliance	1	Disclosure of the bank's overall risk management framework description.
		2	Disclosure of specific integration of ESG risks (including climate, social) into the risk management framework.
		3	Presence of a formal ethics policy or code of conduct.
		4	Disclosure of policies and procedures related to anti-corruption and anti-bribery.
		5	Internal control mechanisms.
		6	Disclosure of whistleblower mechanisms/policy.

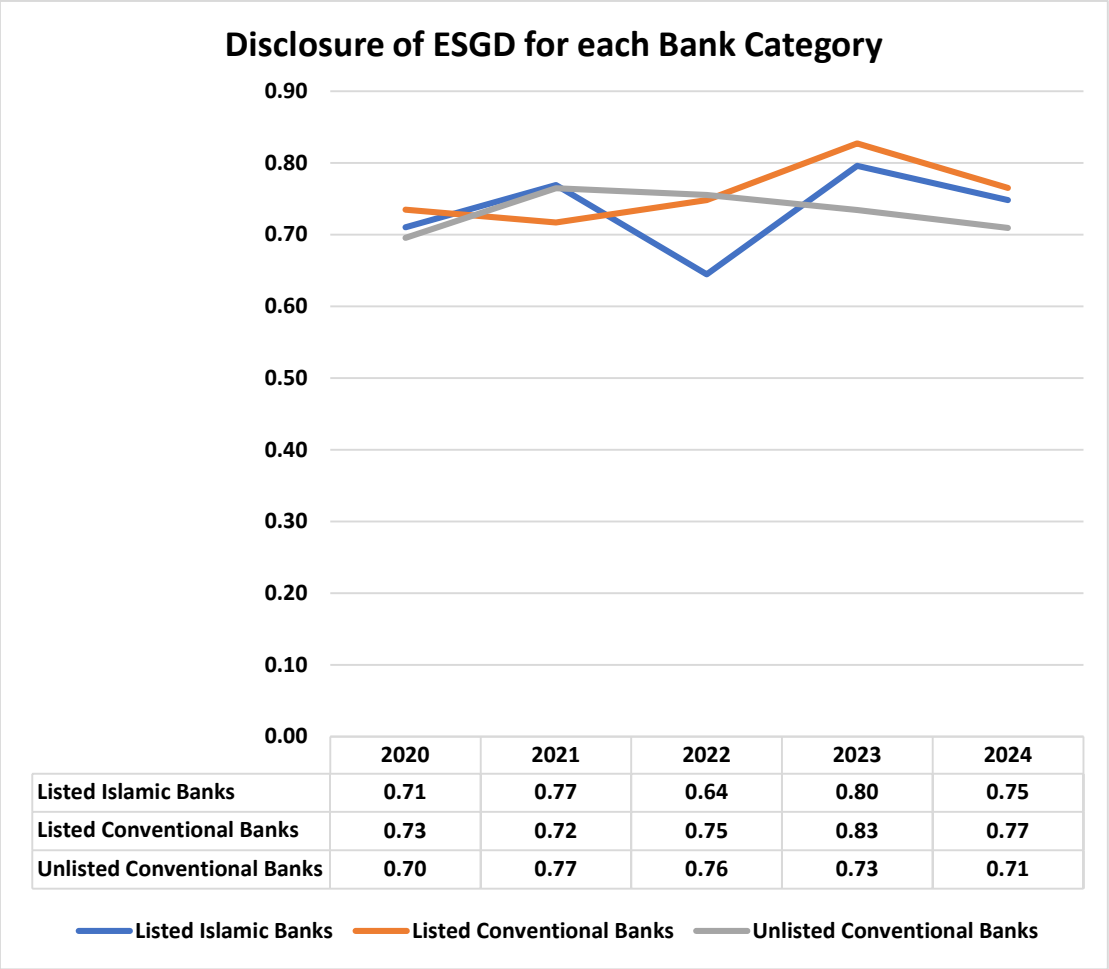
7. Statistical Results Analysis

7.1 Descriptive Statistics

As shown in Table (4), the dependent variable, lnESGD (log-transformed ESGD index), has an average of -0.3009, which means ESGD had an average of 0.7. The small standard deviation (0.0887) suggests relatively homogenous disclosure levels across banks. The range of ESGD was between 62% and 90%, confirming some variation. This shows an overall good disclosure in the banking sector. The independent variables showed interesting patterns across all the different variables. ZOE has a mean of -0.96677, indicating that most banks perform below the industry average in cost management and asset utilization. ZMV, however, shows a positive mean (0.674), suggesting that banks are generally overvalued in the market, though the high standard deviation (2.9836) and extreme maximum value (18.9989) reveal significant outliers. ZSFG has a strikingly low mean (-3.3066), implying that sustainable financial growth is weak across the sample, with little variation (standard deviation = 0.164), which is low compared to the average. Regarding control variables, it seems the banks lend out about 40% of their deposits, reflecting high liquidity management. In addition, board size had an average of 21, and ROE had an average of 17.4%. Both measures had relatively very low heterogeneity.

Table (4) Descriptive Summary of Statistics for all the Variables

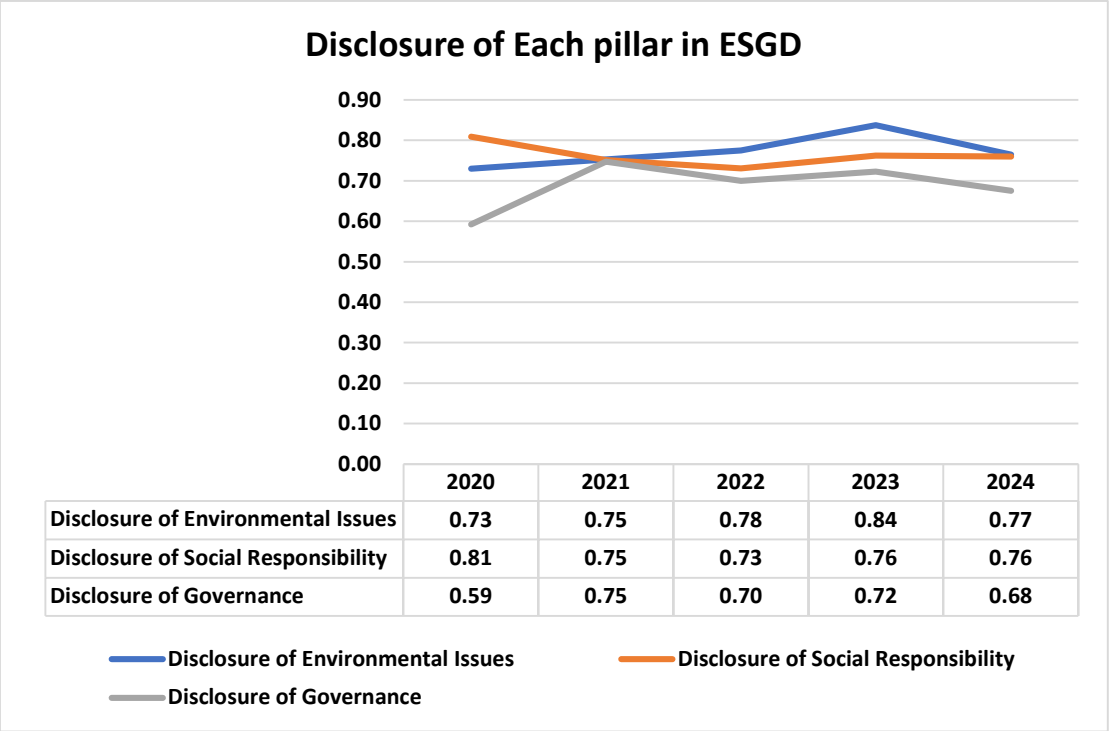
Variable	Obs.	Mean	Std. Dev	Min.	Max.
lnESGD	125	-0.3009	0.088703	-0.47804	-0.10536
ZOE	125	-0.96677	0.275189	-1.4664	-0.26662
ZMV	125	0.674445	2.983599	-0.98115	18.99891
ZSFG	125	-3.30659	0.164087	-3.62694	-2.85694
lnBS	125	3.048821	0.071927	2.829412	3.151426
lnROE	125	2.858108	0.354299	1.408545	3.487283
LDR	125	0.401626	0.271735	0.006666	1.87



	2020	2021	2022	2023	2024
Listed Islamic Banks	0.71	0.77	0.64	0.80	0.75
Listed Conventional Banks	0.73	0.72	0.75	0.83	0.77
Unlisted Conventional Banks	0.70	0.77	0.76	0.73	0.71

Figure (2) Line Charts for the ESGD for each Bank Category

The line charts for the disclosure of ESGD along 5 years for each type of bank are shown in Figure (2). The listed Islamic banks witnessed relatively alternating changes. It seems that it increased from 71% to 77% in 2021, followed by a decrease to 64% in 2022, followed by an increase to 80%, which is the highest it was witnessed, and then followed lastly by a downfall in 2024 till it reached 75%. Regarding the listed conventional banks, it seemed to have the contradicting pattern from 2020 till the increase to 75% in 2022. It continued to increase in 2023, reaching 83%, and then had a downfall to 77% in 2024. The unlisted conventional banks witnessed an increase from 70% in 2020 to 77% in 2021, followed by a continuous decrease till it reached 71% in 2024.



	2020	2021	2022	2023	2024
Disclosure of Environmental Issues	0.73	0.75	0.78	0.84	0.77
Disclosure of Social Responsibility	0.81	0.75	0.73	0.76	0.76
Disclosure of Governance	0.59	0.75	0.70	0.72	0.68

Figure (3) Line Charts for each Pillar of ESGD along the 5 Years for the overall Sample

Figure (3) shows each pillar of ESG disclosures separately along the five years of observation for the whole sample. It seems that the environmental pillar had increased in terms of disclosure from 73% to 84% in 2023. Then followed by a slight decrease to 77% in 2024. Regarding social responsibility disclosure, there seems to be a decreasing trend over the years, where it decreased from 81% in 2020 to 76% in 2024. In terms of governance disclosure, it seems there was an increase from 59% in 2020 to 75% in 2021, followed by an increase till 2024, reaching 68%.

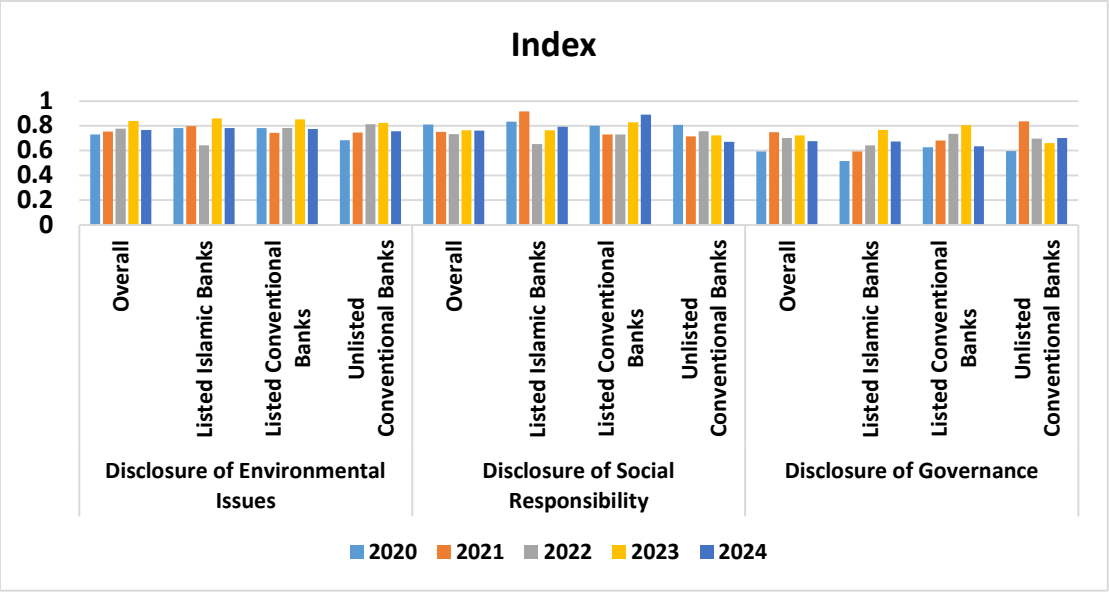


Figure (4) Bar Chart for Disclosures of ESG for each Bank Category

Figure (4) shows the level of overall ESG disclosures for each bank type along the five years of observation. It seems, for all banks, that the highest disclosure of environmental factors was reported to be in 2023, where the Islamic banks had the highest value. The listed conventional banks and unlisted conventional banks seemed to have different patterns, as they seemed to have higher environmental disclosure compared to the listed Islamic banks in the year 2022.

It seems for all banks that the highest disclosures of social responsibility were reported to be in 2021, where the Islamic banks had the highest value. For the conventional banks, the highest values were reported in 2024, while for the unlisted, it was in 2020.

It seems for all banks that the highest disclosure of governance was reported to be in 2021, with the unlisted conventional banks having the highest value. In the year 2023, it was reportedly the highest governance disclosure in the year 2023.

The listed conventional banks had the highest environmental issues and social responsibility disclosure. On the other hand, the unlisted conventional banks had the highest governance disclosure, followed by the listed conventional banks. It seems the unlisted conventional banks also had the lowest environmental issues and social responsibility disclosure.

7.2 Pearson Correlation Analysis

Observing the Pearson correlation coefficient supports whether there is a linear relationship between the variables or not. Table (5) shows that there is no significant evidence of the relationship between the variables and the ESGD. However, this is attributed to the fact that the correlation analysis does not take into consideration more than two variables just at the time. Therefore, further modelling should be taken into consideration. On the other hand, it seems that the relationships between the independent variables were less than 0.7. This shows an indication of the absence of multicollinearity in the model.

Table (5) Pearson Correlation Coefficients and Significance for the Relationships in the Phenomenon

	lnESGD	ZOE	ZMV	ZSFG	lnBS	lnROE	LDR
lnESGD	1						
ZOE	-0.0882	1					
	0.3278						
ZMV	0.0416	0.0828	1				
	0.6454	0.3588					
ZSFG	-0.0849	-0.1272	-0.1638	1			
	0.3463	0.1575	0.0679				
lnBS	0.0848	-0.2845	-0.1191	0.0494	1		
	0.3472	0.0013	0.1857	0.5841			
lnROE	-0.1414	-0.0394	-0.032	-0.0467	0.225	1	
	0.1158	0.6625	0.7235	0.6053	0.0117		
LDR	0.0612	0.1391	-0.0018	0.0538	-0.239	-0.0716	1
	0.4977	0.1217	0.9843	0.5509	0.0073	0.4272	

7.3 Panel Data Analysis

7.3.1 Panel Data Model for the First Hypothesis

As shown in Table (6), to compare between the two models and decide which will be used, the Hausman test should be conducted. The null hypothesis of the test is that the random effect model should be

utilized.

H1: There is a statistical association between bank operational efficiency and environmental, social, and governance disclosure.

$$ESGD_{t+1} = f\ (OE_t,\ Controls)$$

$$ESGD_{it} = \alpha + \beta_1\ CIR_{it} + \beta_2\ AU_{it} + \beta_3\ BS_{it} + \beta_4\ PROF_{it} + \beta_5\ LIQ_{\ it} + \varepsilon_{it}$$

Table (6) Modelling Panel Data Model for the First Hypothesis

Models	Fixed Effect Model				Random Effect Model			
LnESGD	Coefficient	Std. Error	Z	P>z	Coefficient	Std. Error	T	P>t
ZOE	-0.02328	0.0107	-2.18	0.029	-0.0360884	0.0183941	-1.96	0.049
LnBS	0.151265	0.075291	2.01	0.045	0.3894346	1.173854	0.33	0.743
LnROE	-0.04142	0.019343	-2.14	0.032	-0.0475762	0.0258327	-1.84	0.078
LDR	0.02896	0.026678	1.09	0.278	0.0396577	0.0395849	1	0.326
_cons	-0.67783	0.211049	-3.21	0.001	-1.403052	3.566142	-0.39	0.697
Model Significance								
Test Statistic	14.27				7.23			
P-value	0.006				0.000			
Hausman Test								
Test Statistic	12.74							
P-Value	0.013							

From the previous Table (6), it seems that the model is significant, as both p-values are less than 0.05. At a 95% confidence level, the models are significant, and it seems that the fixed-effect model is more appropriate based on the results of the Hausman test p-value being less than 0.05. At a 95% confidence level, it seems that operational efficiency had a negative significant impact on the ESG disclosure. Such that increasing operations efficiency by 1-unit results in a 2% decrease in ESGD. At a 95% confidence level, bank size and ROE had a significant impact on ESG disclosure. As by increasing bank size by 1%, the ESG

disclosure increased by 15%, and by increasing ROE by 1%, the ESG disclosure decreased by 4.14%. Overall, it seems that the first hypothesis is supported. The first model is thus presented as follows:

$$\widehat{lnESGD} = -0.67783 - 0.02328\ ZOE + 0.151265\ lnBS - 0.04142\ lnPROF + 0.02896 LIQ$$

The research results show that ESG disclosures are negatively impacted by operational efficiency practices. This can be explained by the fact that sustainability practices are always attached to high costs; thus, more ESG practices, which will reflect in a high ESG level of disclosures, require a high level of costs, which is completely contrary to the principle of operational efficiency. The primary challenge associated with ESG is its cost. Thus, over-prioritizing ESG at the expense of core operations may reduce bank efficiency because resource allocation to environmental or social initiatives could divert investment from business-critical activities.

Moreover, most banks that emit ESG data have built systems to capture it. Initially, data was tracked on paper or in a spreadsheet. Nowadays, many larger entities have added modules to their software systems to capture and process data and other modules to aggregate it and prepare it to be reported upon the Egyptian Financial Regulatory Authority (FRA) instructions and regulations regarding ESG disclosures. Generating data, capturing data, preparing it, and auditing or assuring it all take time and money, starting from employees assigned to handle "sustainability" issues to the production of an annual sustainability report for the banks that can easily cost thousands of dollars. Software tools for capturing ESG data can cost many thousands of dollars to operate. Assurance for a sustainability report and getting one's auditors involved could add more thousands of dollars to an annual report process.

Although the Egyptian Financial Regulatory Authority (FRA) and the Central Bank of Egypt have introduced mandatory ESG reporting regulations to align with international standards and promote sustainable development, investing in ESG practices in Egypt, like in many other developing countries, is still not promising with high returns. That's why it tends to be an expense or a cost rather than an investment.

Therefore, the higher the cost-to-income ratio and asset utilization ratio, the fewer ESG disclosures appeared in the bank reports, as per the research results. This means the more the bank operates efficiently,

reduces its costs, and utilizes its resources, the more the bank tends to reduce its ESG disclosures to avoid incurring more costs and expenses.

The results come in the shed of operational efficiency theory, which focuses on optimizing business processes and resource utilization to reduce costs and increase productivity while maintaining output and quality (Al Doghan & Sundram, 2023).

Also, the statistical results show a significant relationship between the control variables and the dependent variable. The bank size has a positive impact on ESGD, which means that larger banks tend to have higher levels of ESGD even after accounting for their operational efficiency.

The bank profitability measured by ROE has a negative impact on ESGD, which means that as profitability increases, ESGD tends to decrease, even when accounting for the bank's operational efficiency.

7.3.2 Panel Data Model for the Second Hypothesis

H2. There is a statistical association between bank market value and environmental, social, and governance disclosure.

$$ESGD_{t+1} = f\,(MV_t,\ Controls)$$

$$ESGD_{it} = \alpha + \beta_1\, TQ_{it} + + \beta_2\, BV_{it} + \beta_3\, BS_{it} + \beta_4\, PROF_{it} + \beta_5\, LIQ_{\ it} + \varepsilon_{it}$$

Table (7) Modelling Panel Data Model for the Second Hypothesis

Models	Fixed Effect Model				Random Effect Model			
lnESGD	Coefficient	Std. Error	Z	P>z	Coefficient	Std. Error	T	P>t
ZMV	0.00161	0.002674	0.6	0.547	0.007206	0.003651	1.97	0.051
lnBS	0.183914	0.116912	1.57	0.116	0.036347	0.705778	0.05	0.959
lnROE	-0.04183	0.022942	1.82	0.068	-0.05333	0.030716	1.74	0.086
LDR	0.027739	0.030031	0.92	0.356	0.048784	0.016259	3.00	0.001
_cons	-0.75428	0.351869	2.14	0.032	-0.28373	2.145598	0.13	0.895
Model Significance								
Test Statistic	5.49				2.15			
P-value	0.241				0.081			
Hausman Test								
Test Statistic	0.210							
P-Value	0.995							

From the previous Table (7), it seems that the model is significant, as both p-values are less than 0.1. At a 90% confidence level, the model is significant in the case of the random effect model only. It seems that the random effect model is more appropriate based on the results of the Hausman test, with the p-value being more than 0.05. At a 90% confidence level, it seems that market value had a positive significant impact on the ESG disclosure. Such that increasing market value by 1-unit results in a 0.7% increase in ESGD. At a 90% confidence level, LDR and ROE had a significant impact on ESG disclosure. As by increasing the loan-to-deposit ratio by 1 unit, the ESG disclosure increased by 4.87%, and by increasing ROE by 1%, the ESG disclosure decreased by 5.33%. Overall, it seems that the second hypothesis is supported. The second model is thus presented as follows:

$$\widehat{lnESGD} = -0.28373 + 0.007206ZMV + 0.036347\ lnBS - 0.05333\ lnROE + 0.048784LDR$$

The results show a significant positive relationship between market value and ESG disclosures in the banks of the research sample. Most previous literature indicated that ESG practices and disclosures impact the market value of entities positively, meaning that the more ESG practices, the higher the market value measured by Tobin's q. This is in line with the stakeholder theory, which discusses that activities related to ESG align with the interests of stakeholders and can enhance corporate performance and market value.

Banks with higher market value tend to do more ESG practices and disclosures. Measured by Tobin's q and book value of capital, the market value of the bank has a vital role in enhancing its ESG disclosures, meaning that the more the bank's value in the market, the more sustainable it is. The improvement of the bank's market value encourages it to invest more in the ESG field and consequently satisfy the expectations of its stakeholders. A bank with high market value will be more socially responsible, more governed, and more environmentally friendly to maintain its position and figure in the eyes of the society, government, investors, and all stakeholders. This is in line with legitimacy theory, which is consistent with signaling theory, suggesting that one of the principal goals of businesses is to send a 'signal' to external audiences about their goodwill.

In addition, the statistical results show a significant relationship between the control variables and the dependent variable. The bank liquidity measured by LDR has a positive impact on ESGD, which means that the banks that tend to lend more have higher levels of ESGD even after accounting for their market value.

The bank profitability measured by ROE has a negative impact on ESGD, which means that as profitability increases, ESGD tends to decrease, even when accounting for the bank market value. This could be illustrated by some cultural factors. In Egypt, as a developing country, banks may value profits more than social responsibility. Also, banks thriving on high profits might underestimate the risks associated with poor ESG practices, such as reputational damage or regulatory penalties.

7.3.3 Panel Data Model for the Third Hypothesis

H3. There is a statistical association between bank sustainable financial growth and environmental, social, and governance disclosure.

$$ESGD_{t+1} = f\,p(SFG_t, Controls)$$

$$ESGD_{it} = \alpha + \beta_1 FSR_{it} + \beta_2 SGR_{it} + \beta_3 BS_{it} + \beta_4 PROF_{it} + \beta_5 LIQ_{it} + \varepsilon_{it}$$

Table (8) Modelling Panel Data Model for the Third Hypothesis

Models	Fixed Effect Model				Random Effect Model			
lnESGD	Coefficient	Std. Error	Z	P>z	Coefficient	Std. Error	T	P>t
ZSFG	0.056957	0.023181	2.46	0.014	0.078127	0.028899	2.70	0.007
lnBS	0.185826	0.07346	2.53	0.011	0.438552	0.119179	3.68	0
lnROE	-0.04349	0.019419	-2.24	0.025	-0.06578	0.031257	-2.1	0.046
LDR	0.029526	0.027305	1.08	0.28	0.042261	0.018978	2.23	0.026
_cons	-0.94335	0.280893	-3.36	0.001	-1.72525	3.521055	-0.49	0.629
Model Significance								
Test Statistic	10.85				6.54			
P-value	0.0283				0.001			
Hausman Test								
Test Statistic	9.70							
P-Value	0.046							

From the previous Table (8), it seems the model is significant, as both p-values are less than 0.05. At a 95% confidence level, the models are significant, and it seems that the fixed-effect model is more appropriate based on the results of the Hausman test p-value being less than 0.05. At a 95% confidence level, it seems that sustainable financial growth had a positive significant impact on the ESG disclosure. Such that increasing sustainable financial growth by 1-unit results in a 5.69% increase in ESGD. At a 95% confidence level, bank size and ROE had a significant impact on ESG disclosure. As by increasing board size by 1%, the ESG disclosure increased by 18%, and by increasing ROE by 1%, the ESG disclosure decreased by 4.34%. Overall, it seems that the third hypothesis is supported. The third model is thus presented as follows:

$$\widehat{lnESGD} = -0.94335 + 0.056957ZSFG + 0.185826\ lnBS - 0.04349\ lnROE + 0.029526LDR$$

The significant, positive relationship between sustainable financial growth and ESG indicates that banks with higher sustainable financial growth, measured by sustainable growth rate and financial sustainability ratio, tend to have more ESG disclosures and practices. This matches the principle of sustainability theory, which indicates that banks, as a core unit of economic development, can only attain long-term sustainable development for themselves, the entire economy, and society by striking a balance between their own advantages and those of the environment and society. According to sustainability theory, banks that disclose ESG-related information are better equipped to build social capital and recognition as well as advance their financial stability and sustainability.

In such a context that positions ESG as a requirement by various stakeholders, it becomes a target for banks to align their policies and disclosures to reflect their commitment to ESG, which explains the persistent correlation between ESG and sustainable financial growth, as banks with low ESG profiles tend to demonstrate less resilience and growth.

The statistical results of the research clarify that banks with high sustainable financial growth engage more in ESG practices and disclosures, and this could be explained by the fact that banks with higher SGR and FSR tend to meet stakeholders' demand for sustainability, ensure regulatory compliance, attract socially responsible investors, build reputation and trust, drive innovation, and focus on long-term value creation, growth, and resilience. This integration fosters a virtuous cycle where sustainable growth reinforces responsible business practices.

As previously discussed in the results of the first and second hypotheses, the statistical results of the third hypothesis show a significant relationship between the control variables and the dependent variable as well. The bank size has a positive impact on ESGD, which means that larger banks tend to have higher levels of ESGD even after accounting for their sustainable financial growth. Also, the bank profitability measured by ROE has a negative impact on ESGD even when accounting for the bank's sustainable financial growth.

7.4 Hypotheses Summary

Table (9) Hypotheses Summary

	Model 1		Model 2		Model 3	
	Type	Sig	Type	Sig	Type	Sig
ZOE	Indep	Yes	-	-	-	-
ZMV	-	-	Indep	Yes	-	-
ZSFG	-	-	-	-	Indep	Yes
lnBS	Control	Yes	control	No	control	Yes
lnPROF	Control	Yes	control	Yes	control	Yes
InLIQ	Control	No	control	Yes	control	No
Overall hypothesis	*Supported*		*Supported*		*Supported*	

Table (9) presents a summary of the outcomes from the hypotheses evaluated through three regression models that examine the connection between ESG disclosure and the primary independent variables: operational efficiency (ZOE), market value (ZMV), and sustainable financial growth (ZSFG). The findings consistently uphold the three principal hypotheses across all models.

In Model 1, **operational efficiency (ZOE) is identified as having a statistically significant effect on ESG disclosure, which aligns with the hypothesis suggesting that efficiency may diminish non-financial disclosure efforts.**

In Model 2**, market value (ZMV) reveals a significant correlation with ESG disclosure, suggesting that banks with a higher market valuation are more likely to disclose ESG information.**

In Model 3**, sustainable financial growth (ZSFG) exhibits a significant positive correlation with ESG disclosure, affirming that financial sustainability promotes increased transparency. The control variables display mixed significance across the models, with profitability (lnPROF) being consistently significant, whereas bank size (lnBS) and liquidity (lnLIQ) show varying degrees of influence. In summary, the Table (9) substantiates the proposed hypotheses, reinforcing the conclusion that financial and operational characteristics have a substantial impact on ESG disclosure within the Egyptian banking sector.**

8. Conclusion

8.1 The Impact of Operational Efficiency on Environmental, Social, and Governance Disclosure

The research investigates the impact of operational efficiency on ESG disclosure in 25 Egyptian banks. Results show that operational efficiency has a significant negative impact on ESG disclosure after adjusting for bank size, profitability, and liquidity. The fixed effect model is the superior analytical strategy, with a p-value below 0.05.

The research also reveals that banks with higher operational efficiency may devote less money to ESG-related initiatives or disclosures. Efficiency-driven banks prioritize cost reduction and immediate financial returns over ESG practices, which are often seen as long-term or non-revenue-generating projects. ESG initiatives may not be seen as strategic investments but as financial burdens.

Bank size and profitability significantly impact ESG disclosure. Larger banks may have more resources, be subject to more stakeholder scrutiny, or have stronger governance structures to promote ESG practices. Conversely, banks that prioritize maximizing shareholder returns may deprioritize ESG investments if perceived as lowering immediate profitability.

Empirical evidence supports the first hypothesis, indicating a statistical relationship between ESG disclosure and bank operational efficiency. These findings highlight the importance of striking a balance between sustainability goals and financial performance targets, especially in emerging markets like Egypt where ESG frameworks are still developing.

8.2 The Impact of Market Value on Environmental, Social, and Governance Disclosure

The study investigates the impact of market value on ESGD in 25 Egyptian conventional and Islamic banks. Control variables such as bank size, profitability, and liquidity were also considered. The results show a favorable and statistically significant association between market value and ESG disclosure. A 0.7% increase in ESG disclosure is equivalent to a one-unit rise in market value, suggesting that banks with higher market valuations may be more likely to invest in open ESG practices.

The loan-to-deposit ratio (LDR) positively impacts ESG disclosure, with a 4.87% increase in ESGD for every unit increase in

LDR. However, profitability (ROE) adversely affects ESG disclosure, with a 5.33% decrease for every 1% increase in ROE. This suggests that highly successful banks view ESG initiatives as cost centers rather than value generators or prioritize financial performance over ESG disclosure.

The findings confirm the second hypothesis, confirming that market value plays a major role in determining ESG disclosure in the Egyptian banking industry. The study underscores the relationship between non-financial transparency and financial performance, as well as the importance of institutional and market forces in influencing ESG practices, especially in emerging markets.

8.3 The Impact of Sustainable Financial Growth on Environmental, Social, and Governance Disclosure

The study examined the relationship between ESG disclosure and sustainable financial growth in 25 Egyptian Islamic and conventional banks. The results showed that ESG disclosure is positively and significantly impacted by sustainable financial growth, with ESGD increasing by 5.69% for every unit increase in sustainable financial growth. This suggests that banks that achieve sustainable and balanced financial development are more likely to use open and honest ESG procedures, prioritizing stakeholder involvement and long-term stability.

Bank size showed a positive and significant influence on ESG disclosure, with an 18% increase in ESG disclosure correlated with a 1% rise in bank size. However, for every 1% rise in profitability, ESGD decreased by 4.34%. This could be due to short-term concentration on financial returns or a short-term focus on ESG investments.

In conclusion, the findings validate the third hypothesis, demonstrating that ESG transparency in the Egyptian banking industry is significantly improved by sustainable financial growth. The data emphasizes the importance of incorporating sustainability into banks' core financial strategy, especially in emerging markets, and the role of long-term financial stability in promoting accountability and transparency in ESG policies.

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