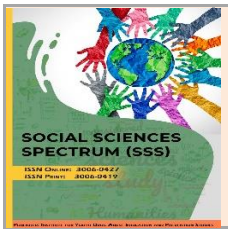

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Nexus Between Sustainability Reporting and Firm Performance: Moderating Role of Financial Slack

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Abstract

Financial performance is a key indicator of a firm's financial health over a specific period, considering various financial, operational, and sustainability factors. This study examined the effect of sustainability reporting on firm performance and also the moderating role of financial slack resources in this relationship. The research used secondary data from 548 firms across five developed Asian countries from 2010 to 2020, collected from the Thomson Reuters Asset4 ESG database. The findings revealed that sustainability reporting has a positive and statistically significant impact on firm performance, measured by return on assets (ROA) and Tobin's Q. Firms that do not engage in sustainability reporting face negative effects on their performance, while those with more robust sustainability reporting tend to perform better. Additionally, as proxied by ROA, financial slack resources have a negative but statistically insignificant effect on the relationship between sustainability reporting and firm performance. The effect is positive but insignificant when measuring performance by Tobin's Q. This implies that access to financial slack resources does not directly require developed economies to function, but may influence managers to view slack resources as a long-term investment in sustainability reporting.

Keywords: Financial Performance, Sustainability Reporting, Financial Slack Resources, Firm Size, Firm Leverage, Ordinary Least Squares (OLS), Return on Asset, Tobin's Q, Fixed Effect Model.

Introduction

Financial performance evaluates a firm's financial health over a period, assessing how a leader manages shareholders' wealth and investment to generate additional profit. It can be measured in terms of profitability, market value, growth, return on shareholders, customer satisfaction, and economic value added (Carroll, 2004). Profit maximization is a key objective for organizations, with profitability being a crucial factor in determining performance (Inalegwu et al., 2024). It is also vital in evaluating the management's effectiveness and efficacy, specifically when it comes to shareholders' investments. The effectiveness of the management team in generating additional capital from initial investment is crucial for a firm's success.

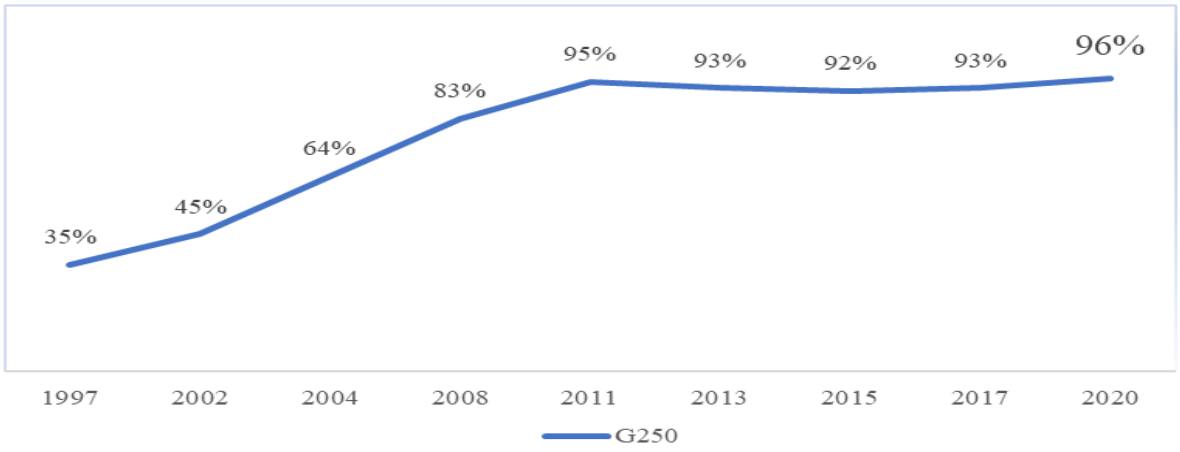
Firm performance is a crucial aspect of public trust and can be measured by market or accounting performance. Market performance includes Tobin's Q ratio, which denotes the long-term profitability requirements, while accounting performance uses the Return on Asset (ROA) profit ratio, which calculates a firm's profitability from its assets (Dkhili, 2023). Several factors that affect firm performance include financial, operational, and sustainability factors (Almulhim et al., 2024). Firms should not only focus on owners' wealth but also consider the interests of those who are indirectly or directly affected by modern business practices.

Companies are moving toward long-term sustainable goals for maximizing profit globally, driven by challenges like social disturbance and climate change (Zhao et al., 2018). In the long term, Sustainable firms are more likely to be successful. They are further appealing to investors, customers, and employees also stand an effective chance of gaining investment, gaining the stakeholders' trust, and keeping up with changing legal requirements and securing long-term success as global markets change (Alim et al., 2025). Social and governance factors significantly influence the performance of a firm (Muse et al., 2025)

Sustainability reporting, developed by the International Institute of Sustainable Development, evolved from corporate responsibility reporting in the 1980s. It helps in setting goals, measuring performance, and handling change in the direction of a sustainable global economy that links long-term profitability with environmental care & social responsibility. Various guidelines have been developed to ensure clarity, transparency, and comparability in sustainability reporting. GRI, founded in 1997, is the most commonly used worldwide for businesses due to its ease of use and translation into all major languages. According to a survey by KPMG in 2020, GRI remains the main global standard for sustainability reporting, with N100 companies and G250 firms reporting on it (Sahin et al., 2017). This study utilized the Thomson Reuters ESG score as a proxy for sustainability reporting. This includes three main components: environmental, social, and corporate governance. ESG disclosure addressed various issues with both positive and negative influences on the environment, the social order, and corporate governance systems. The ESG score incorporates 10 key score types. The environmental score contains innovation, resource use, and emission, and covers 34% weight; the social score contains human rights, product responsibility, community, and workforce, and covers 35.50% weight; and the governance score contains CSR strategy, management, and shareholders, and covers 30.50% weight.

Sustainability reporting benefits stock exchanges by enhancing a firm's reputation, value, and performance. Top management utilizes resources to meet shareholders' demands, minimizing agency costs and conflict of interest (Aouadi & Marsat, 2018). Firms with sustainability reporting are more profitable and favorable as investors pay a premium for socially, environmentally, and responsibly performing firms (Swarnapali, 2018). Sustainability reporting has seen a gradual

increase in firms addressing environmental and social issues, with 96% of the top 250 Fortune 500 firms contributing to sustainability reporting by revenue in 2020 (Threlfall et al., 2022).

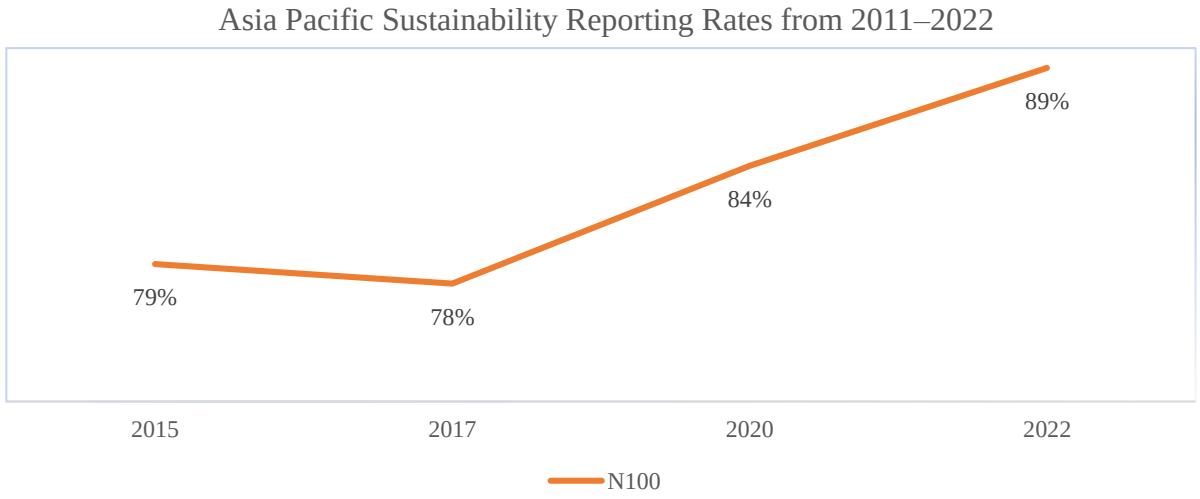


Source: *Author's Estimation*

Figure 1.1: *KPMG 2022 shows Growth in global sustainability reporting rates since 1997*

Figure 1.1: *KPMG, 2022 shows Asia Pacific Sustainability Reporting Rates from 2011–2022*

According to KPMG (2022), among the N100 Asia heads in sustainability reporting, 89% of its companies carry out sustainability reporting, go along with Europe 82%, the Americas 74%, and the Africa & Middle East 56%.



Source: *Author's Estimation*

According to KPMG (2022), Asia Pacific, which includes major developed economies of Asia, leads in sustainability reporting among the N100, with 89% of its firms undertaking sustainability reporting, followed by Europe, 82%, the Americas, 74% and the Middle East & Africa, 56%. Adoption of sustainability reporting positively impacts firm value and performance (Soomiyol et al., 2023). Several studies have found a positive and significant relationship between sustainability reporting and corporate performance (Inalegwu et al., 2024; Samy et al., 2010; Almashhadani &

Almashhadani, 2023; Oncioiu et al., 2020; Motwani & Pandya, 2016), whereas several studies have found a negative relationship (Sarkis & Cordeiro, 2001; Hewathudallage & Weerasinghe, 2023; Reddy & Gordon, 2010).

The association between sustainability reporting and firm financial performance is prevalent, as it provides guidelines and direction to the firms, investors, and also to stakeholders such as governments. Furthermore, it also provides knowledge for managers on whether they should commit firm valuable resources into sustainability practices and reporting or not (Ameyaw et al., 2023). A positive relationship between sustainability reporting and firm performance may provide confidence and motivation to the managers of a firm to commit company financial resources hooked on sustainability reporting activities. In contrast negative relationship may restrain the manager to stay away from committing meaningful resources, even in the regimes of obligatory reporting (Boso et al., 2017). Policymakers or the government may consider their relationship to incentivize a sustainable development plan (Ameyaw et al., 2023). Also, financial resources are essential for organizations to achieve their objectives, and sustainability initiatives often add additional burden and cost to the firm. Financial slack resources refer to the difference between the total of the resources available and the total of resources essential to sustain synchronization between the firm and its environment. They could be the result of good organizational performance or bad planning (Voss et al. 2008) and contribute to the association between sustainability and a firm's performance. Companies having greater financial slack resources can achieve higher sustainability activities, like environmental and social matters (Xiao et al., 2018). These resources are considered necessary because, through their organizations, they are capable of adjusting immediately to take advantage of business opportunities along with dealing with unbearable risks that may emerge in the path of their operational activities, which ultimately increases the performance of the firm (Shahzad et al., 2016). Studies found a positive impact of financial slack resources on the performance of firms in developed economies, but this relationship has an ideal level, proposing that holding a large amount of financial slack resources leads a firm's performance toward decline (Lefebvre, 2021).

Literature Review

Aggarwal (2013) reviewed extensive literature to critically analyze the effect of sustainability reporting on a company's performance using a qualitative and descriptive research approach and surveyed the findings and limitations of different research articles referring to the research objective. The majority of results showed that sustainability reporting enhanced a firm's repute and financial performance of firm which further results in countless interactions and assistance to the reporting firm.

Ermenc et al. (2017) examined the relationship between corporate sustainability reporting and financial performance in Central and Eastern European countries, where a proxy for sustainability was used as corporate sustainability reporting. Data included 80 non-financial Slovenian companies and were extracted from the GVIN database from 2007 to 2014. The empirical results of the study showed that sustainability led to better financial performance, and it also concluded that financial performance did not affect sustainability, which meant it was a one-sided relationship, not simultaneous. With this result study concluded that for managers, it is very important to understand this relationship so that they can make better decisions about resource allocation.

Şahin et al. (2017) studied the extent to which sustainability reporting affects the financial performance of firms from the period of and the key purpose of the study was to explain the

importance of sustainability reporting in Turkey. For this purpose, the BIST sustainability index 15 company's performance was compared in the periods after and before entering the index. Results exhibited that there was no significant difference between companies' performance in terms of equity capital, profit margin, and return on assets in these ages could be found. This showed that in Turkey, inadequate importance was given to sustainability issues, which might be due to a lack of awareness because of the current introduction and calculation of the index.

Rahman & Chowdhury (2019) aimed to evaluate alternative measurement and operation methods that were applied to the SR and FFP concepts in empirical literature on the relation between SR and FFP. The study yielded different observations. First in the empirical literature, sustainability operations ranged from 20 multidimensional to one-dimensional. Secondly, the measurement of SR methods comprises single-dimensional measurement, sustainability indexes, and content analysis, whereas methods of measurement of FFP include market-based, market value of equity, composite, and accounting-based measurements. The third method to measure SR was not harmful. Selection anomalies and subjectivity of the research are two problems that were identified that affect the SR and FFP relationship. Amahalu (2019) critically analyzed the impact of sustainability reporting on the corporate performance of listed gas and oil companies in Nigeria, which revealed that sustainability reporting at 5% level of significance had a positive impact on net profit margin, earnings per share & return on equity. From results study suggested adopting a standardized sustainability index, so it will help to put some stress on companies to give additional attention and concentration to the environment, and also take sustainability seriously.

Oncioiu et al. (2020) asserted that indicators of sustainability reporting could be cohesive with the reporting of the company's financial performance, and sustainability can also be transformed into tangible 23 value for all external (shareholders) and internal parties (employees) in Romanian companies. The study suggested that a positive relationship between company reporting level and firm performance could encourage companies to engage in CSR activities and afterward report these activities transparently and objectively.

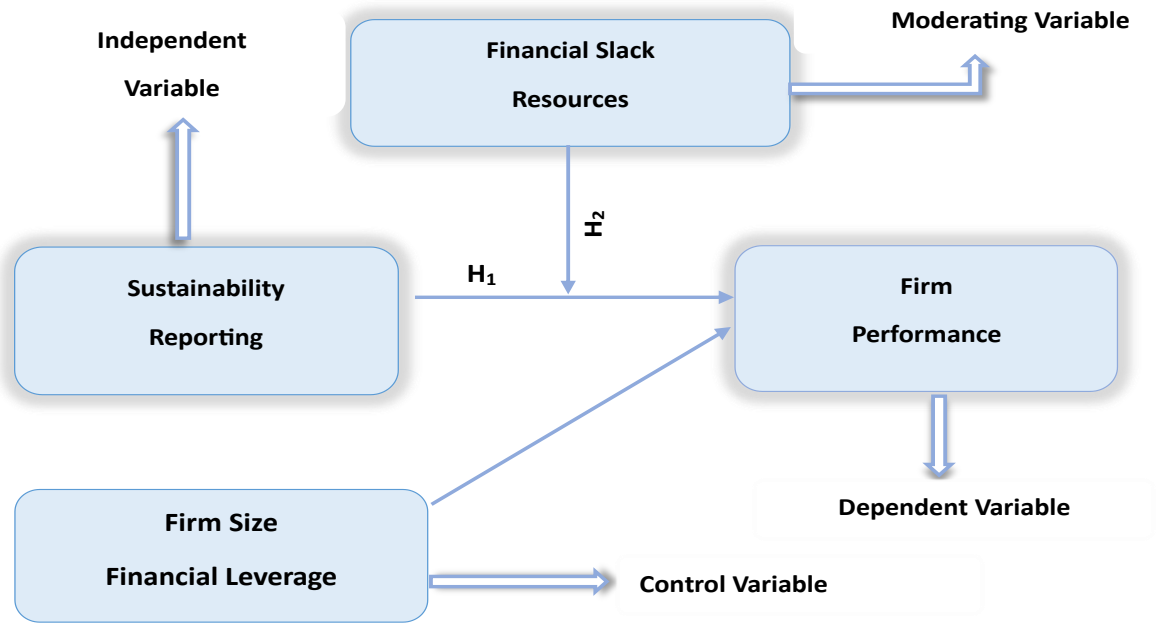
Attah-Botchwey et al. (2022) examined that economic, governance, and social sustainability reporting content had a positive and significant association among sustainability reporting and performance of twenty listed banks in Africa, covering the period of 2010-2020, and applied a panel fixed effect regression model to estimate the association among these. Furthermore, the study also suggested that environmental sustainability content had no significant effect on Tobin's Q but had a positive significant effect on ROA, and it was also recommended that policymakers should develop a sustainability framework that is specifically designed for the banking industry.

Mamun (2022) investigated 19 Australian electricity companies by using GRI G4 sector-specific guidelines by running a regression from 2018-2019. Results exhibited that sustainability reports had an association with the company's performance. Additional results showed that only social and economic performance disclosure significantly influences firm performance. Results helped to guide managers to get involved in sustainability activities and reporting to increase the performance of the firm, and also attract more investors and stakeholders. Razak et al. (2022) examined the literature related to sustainability reporting and firm performance built on four theories, including legitimacy theory, stakeholder theory, signaling theory, and agency theory. Results showed that sustainability reporting had a positive impact on firm performance in the long term and suggested that to get support from investors and stakeholders who could recover the value of the firm and move market sustainability reporting, deliver information, and also indirectly expand the economic system of the world.

Ameyaw et al. (2023) examined the relationship between sustainability reporting and financial performance and also studied the moderating effect of financial slack resources on sustainability reporting and a firm's financial performance. The study was constructed on panel data of 110 firms listed on the Johannesburg Stock Exchange of listed firms in South Africa over 10 years from 2012-2021. Study showed significant but negative association among sustainability reporting and return on asset and positive but insignificant relationship between sustainability reporting and Tobin's Q. furthermore, high level of financial slack resources had a significant and positive moderating effect as well as low level of financial slack resources had a negative moderating effect on the relationship among suitability reporting and firm financial performance. Hassan et al. (2024) found that sustainability reporting was statistically significant but negatively affected firm performance, but each dimension had 39 statistically positive impact on firm performance. Furthermore, moderating variables financial slack resources and R&D intensity, positively impact the relationship between sustainability reporting and firm performance also positive impact on the relation between sustainability reporting's individual dimension and firm performance. By running regression analysis, the data for analysis were extracted from 423 listed non-financial companies registered in 28 sectors on the Pakistan Stock Exchange (PSX), Pakistan. The result of this study also helps regulators, policymakers, and government officials to know the role of R&D intensity and financial slack resources in moderating the effect on the relationship between sustainability reporting and firm performance.

Research Methodology

Conceptual framework



Theoretical Framework

Stakeholder Theory

Stakeholder theory was suggested by Edward Freeman in 1984, is widely credited as the father of theory. It argues that sustainability reporting practices improve financial performance and that firm should actively address their shareholder interest (Freeman 1984). He defines stakeholders as parties affected by decisions of firms, including suppliers, employees, service providers, customers, shareholders, lender, and non-governmental.

A variant of stakeholder theory is Instrumental stakeholder theory, suggests that ethical behaviors such as care, fairness, loyalty, mutual respect, and trustworthiness can improve financial performance (Donaldson & Preston, 1995). Firms that strategically contract with the shareholders through mutual trust and cooperation gain a competitive advantage (Jones, 1995). Sustainability reporting is a system that appeals to its stakeholders by disclosing information about environmental responsibility, social responsibility, and governance competency. This approach helps companies gain shareholder support and demonstrate their commitment to sustainability.

Legitimacy theory

Legitimacy theory was first developed in 1975 by Dowling and Pfeffer. Lindblom (1993) explains legitimacy theory as "a condition which exists when an entity's value system is in harmony with the value system of society. Legitimacy theory suggests that sustainability activities may help an organization improve its legitimacy by showing that it can meet its stakeholders' competing needs and operate profitably at the same time. In that way, a firm would be perceived as a member of the community, and its operations would be allowed.

Econometric Model

$$ROA_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 FSR_{it} + \beta_3 FSz_{it} + \beta_4 FL_{it} + \varepsilon i_{it}$$

$$ROA_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 FSR_{it} + \beta_3 ESG_{it} * FSR_{it} + \beta_4 FSz_{it} + \beta_5 FL_{it} + \varepsilon i_{it} \quad \text{----(i)}$$

$$TQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 FSR_{it} + \beta_3 FSz_{it} + \beta_4 FL_{it} + \varepsilon i_{it}$$

$$TQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 FSR_{it} + \beta_3 ESG_{it} * FSR_{it} + \beta_4 FSz_{it} + \beta_5 FL_{it} + \varepsilon i_{it} \quad \text{----(ii)}$$

In equations (1) and (2), Return on asset (ROA) is the dependent variable, used as a proxy for firm performance. ESG is an independent variable, used as a proxy for sustainability reporting. FSR stands for financial slack resources, used as a moderating variable in the nexus between sustainability reporting and firm performance. Firm size (FSz) and firm leverage (FL) are control variables used in this study. TQ is a dependent variable, used as a proxy for firm performance. Additionally, firm size (FSz) and firm leverage (FL) are control variables employed in this study.

Data Source

The research uses Thomson Reuters Asset4 ESG rating for sustainability analysis, which is crucial for investment evaluation. Secondary data from five developed countries (Japan, South Korea, Singapore, Hong Kong, China) was collected from the Asset4 ESG database of Refinitiv, also known as the Thomson Reuters database, from 2001-2021. This database, the most commonly used in the financial industry, contains ESG ratings of over 6500 firms worldwide based on 400 ESG metrics. Its main purpose is to process publicly available information. This dataset incorporates 10 key score types. Environmental (resource use, emission & innovation), social (social rights, product responsibility, community and workforce), and governance (CSR strategy, administration and shareholders). The database's headquarters are located in Europe.

Variables Description

Name	*Symbol*	*Definition*	*Literature*
Dependent Variables			
TOBIN'S Q	TQ	(Market Capitalization+ Total Liabilities) ÷ Total Assets	(Dincer et al, 2023; Gunarsih et al., 2019 Paleni et al., 2024; Swarnapali & Le, 2018)
RETURN ON ASSET	ROA	Net Income ÷ Total Assets	(Botchwey et al., 2022; Alim et al., 2022; Said et al., 2015 Ali et al., 2023; Duque-Grisales & Aguilera-Caracuel 2021)
Independent Variable			
SUSTAINABILITY REPORTING	ESG	Total Score of Environmental + Social + Corporate Governance Reporting (Awarded by Refinitiv)	(Jalahma et al., 2020; Chin, 2022; Sharma et al., 2022)
Moderating Variable			
FINANCIAL SLACK RESOURCES	FSR	Current Assets ÷ Current Liabilities	(Ameyaw et al., 2023; Duque-Grisales & Aguilera-Caracuel 2021)
Control variables			

FIRM SIZE	FSZ	Natural Log of the Firm's Total Assets Value	(Pau Chee & Bakri 2023)
FIRM LEVERAGE	FL	Annual % Growth in Sales Revenue	(Ismail et al., 2022; Wasara & Ganda, 2019; Pau Chee & Bakri 2023)

Results and Discussion

Descriptive Statistics

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
ROA	6028	0.09457	0.0635847	-1.001677	0.8733
TQ	6028	0.9981148	0.7259568	0.1014809	12.60929
ESG	6028	45.48565	20.92896	1.24	93.61
FSR	6028	200.1713	4980.304	0.0165999	202235
FSR*ESG	6028	8022.825	198125.9	0.6955347	11,600,000
FS	6028	8.707967	0.9689037	5.424896	11.5783
FL	6028	0.2557589	0.2352798	0.0000243	11.12079

Source: *Author's Estimation*

Table 2 shows the descriptive summary of all variables employed in the study. The mean value of ROA is 0.09457; it deviates 0.0635847% from its mean, minimum value -1.00167, and maximum 0.8733. The average value of TQ is 0.9981, ranging from 0.10148 to 12.6092. with the standard deviation value of 0.72595. The mean value of sustainability reporting (ESG) is 45.48565, with a standard deviation of 20.92896, a minimum value of 1.24, and a maximum value of 93.61. The average value of FSR is 200.1713, which is a moderating variable. The minimum value of FSR is 0.0165999 with a maximum value of 202235, and the value of the standard deviation is 4980.304. The mean value of ESG*FSR is 8022.825, ranging from 0.6955347 to 11,600,000. The value of the standard deviation of ESG*FSR is 198125.9. The current study also used two control variables. The mean value of FS is 8.707967, deviating 0.9689037% from its mean, ranging from 5.424896 to 11.5783. Moreover, the mean value of FL is 0.2557589, the minimum value is 0.0000243, and the maximum value is 11.12079. The value of the standard deviation is 0.2352798.

Correlation Matrix

	ROA	***TQ***	***ESG***	***FSR***	***FS***	***FL***
ROA	1.0000					
TQ	0.3983	1.0000				
ESG	0.0690	-0.0337	1.0000			
FSR	-0.0035	0.0059	-0.0104	1.0000		
ES	0.0307	-0.1870	0.3700	-0.0058	1.0000	
FL	-0.3582	0.0580	-0.0041	-0.0392	0.0344	1.0000

Source: *Author's Estimation*

Table 3 indicates no sign of multicollinearity, as most of the variables have below 70% correlation. Hence, no such high correlation exists among the variables. The correlation matrix exhibits that a positive correlation exists among ROA and ESG, ES, and FL, and a negative correlation between ROA and FSR. It also shows that there is a positive correlation among TQ and FSR, and FL. Conversely, a negative correlation exists between TQ and ESG and ES.

Variance Inflation Factor (VIF)

Variable	***VIF***	***1/VIF***
FS	1.16	0.861796
FSR	1.00	1.000000
ESG	1.16	0.862797
FL	1.00	0.996991
FLFSRESG	1.00	0.998467

Source: *Author's Estimation*

Table 4 illustrates the findings of the variance inflation factor (VIF), which indicates correlation and multicollinearity present within the regression model of the study. VIF values falling between 1 and 5 indicate nominal correlation, while values beyond 5 signify high correlation. All variables in the study have a value of VIF below 5, indicating the absence of multicollinearity in the dataset.

Simple Regression (OLS) Without Moderation

ROA	*Coef.*	*Std. Err.*	*T*	*P> |t|*	*[95% Cof. Interval]*	
ESG	0.0001817	0.0000392	4.63	0.000	0.0001048	0.0002586
FS	0.0013713	0.000848	1.62	0.106	-0.000291	0.0030336
FL	-0.096924	0.0032442	-29.8	0.000	-0.1032844	0.0905648
Cons	0.0991519	0.0069855	14.19	0.000	0.0854578	0.1128459

Source: *Author's Estimation*

Table 5 exhibits the result of a simple linear regression, revealing the direction and variation quantity in the dependent variable because of a change in the independent variable. Sustainability reporting (ESG) has a coefficient value of 0.00182 and is also statistically significant (0.000). This proposes that 1% increase in ESG increases the firm's performance (ROA) by 0.02%. Moreover, the study uses two control variables, FS and FL. FS has a coefficient value of 0.0013713 and is statistically insignificant (0.106), while FL has a coefficient value of -0.0969246, which explains the negative impact and is statistically significant (0.000).

Simple Regression (Ols) With Moderation (Roa)

ROA	*Coef.*	*Std. Err.*	*T*	*P> |t|*	*[95% Cof. Interval]*	
ESG	0.0001832	0.0000393	4.67	0.000	0.0001062	0.0002601
FSR	0.000000313	0.000000405	0.77	0.440	0.00000048	0.00000111
FSR*ESG	-0.00000001	0.0000000102	-1.41	0.159	0.00000003	0.000000005
FS	-0.0013612	0.0008479	1.61	0.108	-0.0003009	0.0030233
FL	-0.0971318	0.0032462	-29.9	0.000	-0.1034956	-0.090768
Cons	0.0992804	0.0069849	14.21	0.000	0.0855875	0.1129733

Source: *Author's Estimation*

Table 6 shows simple linear regression results with moderation. Sustainability reporting (ESG) has a 0.000183 coefficient value and is also statistically significant (0.000). This means that a 1% rise in sustainability reporting (ESG) increases the firm's performance (ROA) by 0.02%. FSR, moderating variable, has a 0.000000313 coefficient value and is statistically insignificant (0.440). Moreover, ESG with a moderating role of FSR has a coefficient value of -0.0000000143 and is statistically insignificant (0.16). Additionally, the study uses two control variables, FS and FL. FS has a coefficient value of -0.0013612 and is statistically insignificant (0.108), while FL has a -0.0971318 coefficient value and is statistically significant (0.000).

Simple Regression (Ols) Without Moderation (Tq)

TQ	*Coef.*	*Std. Err.*	*T*	*p>|t|*	*[95% Conf. Interval]*	
ESG	0.0014692	-0.0004712	3.12	0.002	0.0005454	0.002393
FS	-0.153541	-0.0101851	-15.08	0.000	-0.173508	0.1335755
FL	0.2012661	-0.0389669	5.17	0.000	0.1248771	0.2776552
Cons	2.21685	-0.0839047	26.42	0.000	2.052367	2.381333

Table 7 exhibits simple linear regression analysis results. Sustainability reporting ESG has a 0.001469 coefficient value and is statistically significant (0.002). This indicates that 1% increases in Sustainability reporting (ESG) increase the firm performance (TQ) by 0.15 %. Additionally, the current study uses two control variables, FS and FL. FS has a coefficient value of -0.1535419, hurting firm performance (TQ) and is statistically significant (0.000). While FL has a 0.2012661 coefficient value and is statistically significant (0.000).

Simple Regression (Ols) With Moderation (Tq)

TQ	*Coef.*	*Std. Err.*	*T*	*p>|t|*	*[95% Conf. Interval]*	
ESG	0.0014732	0.0004716	3.12	0.002	0.0005486	0.0023977
FSR	0.00000146	0.00000487	0.3	0.764	-0.00000808	0.000011
FSR*ESG	-0.00000000895	0.000000122	-0.07	0.942	-0.000000249	0.000000231
FS	-0.1535439	0.0101868	-15.07	0.000	-0.1735136	-0.1335741
FL	0.2021862	0.0390029	5.18	0.000	0.1257265	0.2786458
Cons	2.21623	0.0839222	26.41	0.000	2.051713	2.380748

Source: *Author's Estimation*

Table 8 exhibits the simple linear regression analysis results. Sustainability reporting (ESG) has a 0.0014732 coefficient value, statistically significant (0.002). This indicates that 1% escalation in sustainability reporting (ESG) increases the firm's performance (TQ) by 0.15%. Similarly, FSR, as a moderating variable, has a 0.00000146 coefficient value and is statistically insignificant (0.764). Moreover, ESG, with a moderating role of FSR, has a -0.00000000895 coefficient value and is statistically insignificant (0.942). Furthermore, the study uses two control variables, FS and FL. FS has a coefficient value of -0.1535439, indicating the negative impact on firm performance (TQ), which is statistically significant (0.000), while FL has a 0.2021862 coefficient value and is statistically significant (0.000).

Hausman Test

chi2(4)	*17.70*
Prob>chi2	0.0014

Source: *Author's Estimation*

The Hausman test is used to identify the most suitable model for the study. The outcomes in Table 9 revealed that the value of the Hausman test is less than 0.05, so the null hypothesis is accepted and the fixed effect model is appropriate for this study.

Fixed Effect Model

ROA	***Coef.***	***Std. Err.***	***T***	***p>|t|***	***[95% Conf. Interval]***	
ESG	0.000263	0.0000403	6.52	0.000	0.000184	0.0003421
FSR	0.000000239	0.000000402	0.60	0.551	-0.000000548	0.00000103
FSR*ESG	-0.0000000134	0.0000000101	-1.33	0.185	-0.000000033	6.39e-09
FS	0.001224	0.000841	1.46	0.146	-0.0004247	0.0028727
FL	-0.0966904	0.0032197	-30.03	0.000	-0.1030022	-0.0903787
Cons	0.0967355	0.0069281	13.96	0.000	0.083154	0.110317

Source: *Author's Estimation*

Table 10 exhibits the results of the fixed effect model for ROA. Sustainability reporting (ESG) coefficient value is 0.000263, which is statistically significant (0.000). This denotes that firm performance (ROA) will increase by 0.03% with a 1% increase in sustainability reporting (ESG). Similarly, FSR, as a moderating variable, has a 0.000000239 coefficient value and is statistically insignificant (0.551). Moreover, ESG with the moderating role of FSR has a -0.0000000134 coefficient value and is statistically insignificant (0.185). The study used two control variables, FS and FL. FS has a 0.001224 coefficient value and is statistically insignificant (0.146), while FL has -0.0966904 coefficient value, indicating the negative impact, and is statistically significant (0.000).

Fixed Effect Model (TQ)

TQ	*Coef.*	*Std. Err.*	*T*	*P>|t|*	*[95% Conf. Interval]*	
ESG	0.0015793	0.0004879	3.24	0.001	0.0006229	0.0025358
FSR	0.0000011	4.86e-06	0.23	0.820	-8.42e-06	0.0000106
FSR*ESG	0.000000137	1.22e-07	0.00	0.999	-2.39e-07	2.40e-07
FS	-0.1537227	0.0101777	-15.10	0.000	-0.1736747	-0.1337707
FL	0.2036224	0.038963	5.23	0.000	0.127241	0.2800039
Cons	2.212589	0.0838402	26.39	0.000	2.048232	2.376946

Source: *Author's Estimation*

Table 11 exhibits the results of the fixed effect model for TQ. The coefficient value of sustainability reporting (ESG) is 0.0015793 and is statistically significant (0.001). This denotes that the firm's performance (TQ) will increase by 0.16% with a 1% increase in sustainability reporting (ESG). Similarly, FSR, as a moderating variable, has a 0.0000011 coefficient value and is statistically insignificant (0.820). Furthermore, ESG with a moderating role of FSR has a 0.000000137 coefficient value and is statistically insignificant (0.999). Also, the study used two control variables, FS and FL. FS has a -0.1537227 coefficient value, which describes the negative impact and is statistically insignificant (0.000). FL has a coefficient value of 0.2036224 and is statistically significant (0.000).

Discussion

This research studies the impact of sustainability reporting on the performance of firms, considering financial slack resources moderating factor. Variance inflation factor (VIP) is used to detect multicollinearity in a regression model, and two evaluation approaches are used to determine the hypothesis validity. The study uses ordinary least squares regression (OLS) to recognize the association among firm performance and sustainability reporting, firm size, and firm leverage while using ROA as the proxy for firm performance. Then it determines the same relation but with the moderating role of financial slack resources. The study discovers the association between firm performance and sustainability reporting, firm size, and firm leverage while using TQ as the proxy for firm performance. Then it determines the same relation but with the moderating role of financial slack resources. The Haussmann test is further used to find the appropriate model, which determines that the fixed effect model is fitting and appropriate. Then we use the fixed effect model to determine the association between firm performance and sustainability reporting, financial slack resources, firm size, and firm leverage by using both proxies, ROA and TQ, for firm performance. The outcomes showed that ROA has a significant association with sustainability reporting (ESG). Furthermore, a significant relationship between sustainability reporting and firm performance (TQ). Sustainability reporting with the financial slack resources moderating role has a negative but insignificant effect on the performance of the firm (ROA). Also, Sustainability reporting with the moderating role of financial slack resources has a negative but insignificant effect on firm performance (TQ), opposing the findings of Rahman

et al. (2021) and Ameyaw et al. (2023). Fixed effect model shows that there is a positive and significant relationship between sustainability reporting and firm performance that is measured by ROA, and these findings are consistent with (Attah-Botchwey et al., 2022; Sharma et al., 2022). Furthermore, results showed that there is a positive and significant relationship between sustainability reporting and firm performance, which is measured by Tobin's Q, and these results are stable and consistent with (Attah-Botchwey et al., 2022; Swarnapali, 2018). Moreover, sustainability reporting (ESG) with Financial slack resources, treated as a moderating variable has a negative but statistically found insignificant one in the relationship between sustainability reporting and firm performance that is measured by ROA and a positive but statistically insignificant effect in the relationship between sustainability reporting and firm performance, measured by Tobin's q which is opposed to (Ameyaw et al., 2023) and in line with (Salman et al., 2024).

Conclusion

The study's core objective is to investigate the effect of sustainability reporting on firm performance measured by ROA and Tobin's q in Asian developed countries, highlighting the value and importance of sustainability practices which are ethical and transparent for the sake of sustainable long-term growth and suggest that most firms not involved in sustainability reporting experience adversative effects on their overall firm performance and firms with stronger sustainability reporting tend to exhibit higher firm performance. It shows that the conclusion confirms the outcomes of Dincer et al (2023), which affirms a positive impact of sustainability reporting on the performance of firms measured by ROA and Tobin's Q. This statistically significant and positive impact of sustainability reporting on firm performance, proxied by both ROA and Tobin's Q, is consistence with stakeholder and agency theory. The study also examined the moderating role of financial slack resources on the relationship between sustainability reporting and firm performance. Financial slack resources have negative and statistically found insignificant impact in the relationship between sustainability reporting and firm performance that is proxied by ROA and have positive but statistically found insignificant impact in the relationship between sustainability reporting and firm performance that is proxied by Tobin's q which is opposed to (Ameyaw et al., 2023) and inconsistent with financial slack resource theory but in line with (Salman et al., 2024). These results indicate that having access to financial slack resources not directly required for developed economies' functioning probably modifies the views of managers, who start to view slack resources as an interesting long-term option to invest in sustainability reporting. The study includes two control variables: firm size and firm leverage. Firm size has a statistically insignificant relationship with firm performance. While Firm leverage has a negative and statistically significant relationship with firm performance proxied by ROA which is consistent with (Alim et al., 2022) and a positive and statistically insignificant relationship with firm performance which is proxied by Tobin's Q. These insight delivers worthwhile direction for policymakers, investors, stakeholders, and corporate leaders who are interested in sustainable long-term growth. Some organizations around the world do not make sustainability reporting necessary. The outcome of this research may create interest for organizations to focus on sustainability disclosure as a vital component for sustainable long-term growth.

Recommendation/ Policy Suggestion

Based on the study findings, research recommends that every firm that wants to maximize its financial performance, competitive advantage, and returns, and enhance its market image, should adopt sustainability reporting. Ethical and transparent sustainability practices and policies can improve financial performance and sustainable long-term growth. Firms should follow guidelines

and train staff to disclose sustainable information in their reports, attracting more stakeholders. Shareholders should pay more attention to the organization's sustainability reporting and invest in organizations that adopt sustainable activities and disclosure. Government and regulatory authorities should support sustainable development and reporting by implementing strict policies and increasing enforcement. Supporting policies such as tax deductions, incentives in tendering areas, subsidies, and green credit can motivate firms to adopt sustainable practices. Results also provide guidelines and direction for developed and underdeveloped economies to adopt sustainable development goals as well as provide financial, along with non-financial disclosure, to improve the well-being of society, and achieve a better image and better financial performance.

Conflict of Interest

The authors showed no conflict of interest.

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