The Impact of Corporate Sustainability Performance on the Financial Performance of Pakistani Manufacturing Firms: Evidence from GMM System

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Abstract

The purpose of this study is to investigate the impact of corporate sustainability performance (SP) on the financial performance (FP) of non-financial manufacturing firms in Pakistan. The relationship between SP and FP is still unclear and the manufacturing sector facing some issues about sustainability, that ultimately affect their performance. Quantitative data from eight years of 65 sample firms listed at the Pakistan Stock Exchange (PSX) is collected from annual reports. 2016 was selected due to the Sustainable Development Goals (SDGs) 2030 issued by the United Nations (UN) in 2015. SP is measured through the global reporting indicator (GRI). SP is measured through the content analysis and index created. FP is measured through return on assets (ROA) and return on equity (ROE). Firm size (FS) and total debt to total assets (TDTA) are used as control variables. For analysis generalized moment method (GMM) system is employed. Findings show that SP has a positive significant effect on FP. The resource-based view (RBV) theory supports these findings. According to researchers' knowledge, this is the pioneer study conducted on Pakistani manufacturing firms and employed the GMM model. The findings contribute significantly to the policy implications for the creation of sustainability to improve their FP.

Keywords: Sustainability Performance, Firm Performance, Manufacturing Firms, GMM, Pakistan

Introduction

Does Pakistani manufacturing FP benefit from SP? Numerous research over the past few decades have attempted to answer this question, but the outcomes are inconsistent (Hussain et al., 2018). Manufacturing firms are highly significant to the world's economy because these are almost 90% of all enterprises globally and 60% labor force is engaged in these firms (Khan et al., 2023). In the context of Pakistan (developing country), manufacturing firms constitute a significant economic force, with over five million individuals, about forty percent of the GDP, approximately seventy percent of the workforce employed, and all exports of the country coming from this sector. Pakistan's manufacturing firms do not fully contribute to the country's SDGs, despite their considerable economic contributions (Li et al., 2022).

Manufacturing firms commonly use natural resources without taking into account the effects on the environment on a global scale (Rehman et al., 2022). Seventy percent of global pollution is attributed to

manufacturing firms (Awewomom et al., 2024; Purwandani & Michaud, 2021). Remarkably, ninety-nine percent of these manufacturing firms in developing nations, neglect to include environmental management techniques in their business operations (Dey et al., 2022). Serious consequences from these manufacturing firm's omission of sustainability measures, including their contribution to global warming and the production of natural disasters such as heat waves, tsunamis, cyclones, scarcities, and floods (Fang, 2024). Environmental issues are a significant financial burden for businesses operating in developing nations, resulting in significant economic losses (Sakai & Yao, 2022). To protect their communities and the environment, businesses must implement sustainable practices and actively participate in social responsibility (Zhao & He, 2022).

Teamwork and a collective understanding are essential to fighting climate change, and organizations are essential in assisting the implementation of solutions (Khan et al., 2022). As a strategic approach to support sustainable business practices that give social and environmental concerns top priority and minimize adverse impacts, the concept of SP has been put out (Le, 2022). Finding a sound balance between the pursuit of profit, environmental care, and social responsibility is the aim of sustainability (Saghir & Awais, 2024; Sang & Han, 2023). Elkington (1997), asserts that sustainability encompasses social, environmental, and economic dimensions. Manufacturing associations that strenuously work for sustainable practices that can promote fiscal substance, in extension to gathering stakeholder prospects, are getting increasingly important (Schaltegger & Burritt, 2018). Wagner et al. (2019), assert that sustainability programs can lower charges, improve a business's brand, draw in more socially conscious companies, help cooperation form, and make finance agreements easier. However, also they must look into the relationship between SP and FP If manufacturing enterprises in Pakistan are to fully benefit from sustainability. The previous exploration that assessed SP's impact on FP has inconsistent effects (Hussain et al., 2018). As a result, exploration is needed, with an emphasis on Pakistani manufacturing enterprises, as they deal with further cases about the SP and FP.

The study's theoretical foundation is the RBV. According to the RBV, a company's distinct puissance and resources determine its FP (Barney, 1991). SP can be viewed as a resource that could support FP by strengthening a manufacturing establishment's resource base through tactics like sustainable force chain operation and invention in green technology (Awais, Saghir, & Nasir, 2023; Barney & Hesterly, 2006). A company's capacity to reallocate and reorganize its resources in response to relocating foreign reserves (Teece et al., 1997). This notion is exercised in this study to probe how sustainable practices improve FP in the context of Pakistani manufacturing companies.

It's insolvable to overestimate the significance of this study for Pakistan, where manufacturing enterprises which make up a huge portion of the business community are the backbone of the nation's economy (Awais, Sulehri, Dar, Mohsin, & Estes, 2021; Gerged et al., 2024). These artificial companies do, still, face a variety of expostulations, involving scarce resources, high competition, and environmental conditions. Pakistan also faces socioeconomic expostulations like compensation and profit inequality, as well as environmental cases comparable to contaminant and water disasters. Sustainable business practices are pivotal (Kohtamki et al., 2024; Yaqub, Awais, Aslam, Mohsin, & Rehman, 2022). By analyzing how SP influences the FP of manufacturing enterprises, this study offers a roadmap for Pakistani manufacturing firms to thrive economically and contribute positively to the environment and society at large. To help Pakistan strengthen its economic resilience and achieve sustainable growth while addressing pressing environmental and social issues, this research provides policymakers, business executives, and other stakeholders with useful insights.

The significance of these concepts cannot be disputed, yet it is still unclear how they relate to one another. More specifically, it is essential to look into how SP and FP relate to one another. This study was driven by the idea that modern organizations experience unprecedented amounts of uncertainty and upheaval. Understanding the components that allow manufacturing companies to adapt and respond to changing conditions is therefore essential. The RBV is one of the key theories that form the basis of this work. It builds a research model intending to establish whether or not SP efforts influence how manufacturing firms allocate their resources. Furthermore, this study emphasizes how crucial it is to fund SP projects to

improve organizational resilience and FP. This study also used secondary data and employed the GMM model to check the relationship between these variables.

Our study aims to shed light on these factors' significant influence and the consequences they have for companies operating in Pakistan. The empirical findings demonstrate a significant and positive link between these key variables. The data were collected from 65 manufacturing firms listed at PSX from 2016 to 2023. SP is measured through GRI indicators while FP is measured through ROA and ROE. STATA is used for statistical analysis. Additionally, by firmly establishing these results within the RBV, this study unites theory and practice and provides a thorough grasp of how sustainable practices, when properly used, lead to improved FP. This study has some contributions. Firstly, this study contributes to the literature to investigate the impact of SP on FP in the manufacturing sectors of Pakistan. Secondly, this study used the GMM model which is ignored by previous studies. Thirdly, SP is measured by GRI indicators which are introduced by the UNs. The study has implications for academia as well as for business executives and policymakers' useful information for promoting competitive excellence and sustainable growth in the unique environment of firms.

The remaining sections of the document are arranged as follows: The theoretical underpinning, creation of hypotheses, and conceptual framework are covered in section 2. The methodology is explained in Section 3. The results and discussion are presented in Section Four. While last section, section 5 consists of the conclusion.

Literature Review

Theoretical Background

The fundamental foundations of RBV guide our investigation of the complex interrelationship between SP and FP. The RBV, first introduced by Barney (1991), asserts that a company's potential to gain a competitive edge depends on its capacity to recognize, obtain, and efficiently utilize important and distinctive resources and skills. By fostering precious intangible assets like brand reputation and innovative capabilities, sustainable practices can be seen as strategic resources that improve competitive posture. It implies that firms that are skilled at adapting their sustainability programs quickly are better able to take advantage of new opportunities and control risks, which in turn improves their FP. Prior research has demonstrated that RBV can be used to understand the relationships among financial outcomes, sustainability practices, and competitive advantages. Examples of these studies are Barney (1991) and Teece et al. (1997). These generalities give a strong theoretical frame for our exploration, especially when taking into account Pakistani manufacturing companies.

Hypotheses Development

Sustainability Performance

Elkington was the first to introduce the eidolon of sustainability in 1997. It offers a complete program for scoring marketable success by involving social, environmental, and profitable objects. Sustainability is the thing of adding profitable value generation while also enhancing and securing the environment and society. According to Masud et al. (2019), sustainability is the process of generating value for the association and society. Sustainability practices are the thoughtful operation of policymakers of manufacturing firms that achieve a maintainable balance between furthering social enhancement, environmental conservation, and profitable expansion (Kamble et al., 2020). Helleno et al. (2017) claim that SP is a collection of thoughtful acts intended to satisfy current demands without exposing those of unborn conceptions the industry that uses SP adapts the policies to regard the social, environmental, and profitable goods (Moktadir et al., 2018).

The Brandt and Commission define sustainable evolution as the pursuit of objects that" meet the requirements of the present without exposing unborn conceptions' capability to meet their requirements". This description is harmonious with sustainability. In strategic environments, the journey's corporate social responsibility (CSR) and sustainability may be exercised interchangeably; still, it's important to flashback that CSR has not become as significant as sustainability over time (Beachfront et al., 2015). The

objectification of sustainability into business missions and structures is a sophisticated procurator. Elkington (2018) highlights how social sustainability has been promoted for profitable sustainability with social and environmental considerations, instanced by miscellanies like the' Triple Bottom Line' or' TBL'.

Sustainability Performance and Firm Performance

The relationship between SP and FP has been the reason for the difference in the opinion of researchers. SP has no effects on FP (Revelli & Viviani 2015; Rowley & Berman 2000; Van Beurden & Gössling, 2008). Friede et al. (2015) and Rahi et al. (2024) discovered that old firms have a positive significant effect of SP on FP. According to Albuquerque et al. (2012); Zhou et al. (2024), SP is generally recognized as a strategic standard that could boost a company's profitability. According to Albuquerque et al. (2019); Lourenço et al. (2012), adopting sustainable practices is anticipated to give companies a competitive bite within their region, leading to swelled products and lower exposure to systemic threats.

Earlier studies between SP and FP claim that SP didn't always positive effect on FP. According to some research, there is a correlation between environmental practices and FP, which emphasizes the importance of attending to environmental stakeholders' concerns (Friede et al., 2015; Salama, 2005). As shown by Arvidsson (2022); Fauzi et al. (2007), and Gutiérrez-Ponce and Wibowo (2024) neglecting these stakeholders might result in disagreements, higher costs, and reduced FP. Another study suggests that increasing SP could lead to higher expenses and a decrease in marginal net benefits (Horvathova, 2010). Moreover, given the acknowledged variations across countries and legal systems, the conclusions drawn from these connections may vary based on the particular environment.

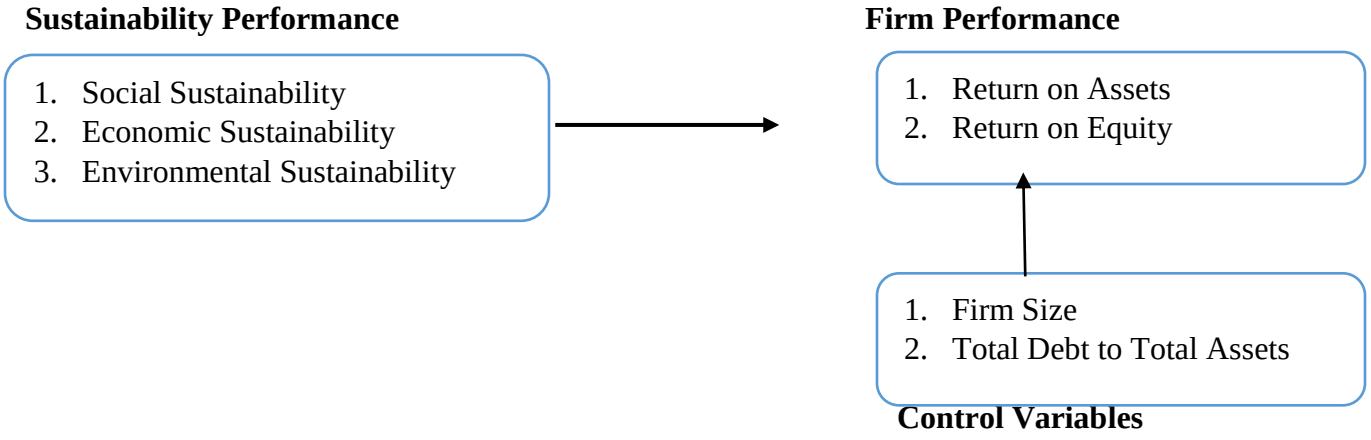
Academics emphasize the importance of examining diverse organizational settings (Theyel, 2000). While some studies demonstrate that SP positively affects FP and gives the company a long-term competitive advantage. Research has also shown that investing with social responsibility leads to better financial outcomes. However, other studies show contradictory findings, such as the notion that business spending on sustainability initiatives wastes money that could be allocated to other lucrative ventures (Peng & Yang, 2014). Weston and Nnadi (2023) have not discovered any connection between SP and FP. To sum up, previous studies on the association between SP and FP have shown contradictory results when looking at specific SP components as well as looking at SP holistically (Friede et al., 2015; Rowley & Berman, 2000). We propose the following hypotheses based on above literature review:

Hypothesis 1: Sustainability Performance has effects on Firm Performance (return on assets).

Hypothesis 2: Sustainability Performance has effects on Firm Performance (return on equity).

Conceptual Fretwork

The conceptual framework of this study is given below in in figure which is created based on literature.



Methodology

Data

The sample for this study consists of 65 manufacturing firms that were listed between 2016 and 2023 on the PSX. The sample was selected based on a set of criteria, which included being a publicly traded non-financial firm, providing facts about sustainability, and remaining listed for the period of the research. The selected study period agrees with the UN's 2015 release of the SDGs mandate for public firms.

Model Specification

The association between SP and ROA has been measured through the following model:

$$ROA_{it} = \beta_o + \beta_1 ROA_{it-1} + \beta_2 SP_{it} + \beta_3 SP_{Ecoit} + \beta_4 SP_{Envit} + \beta_5 SP_{Socit} + \beta_6 FS_{it} + \beta_7 TDTA_{it} + €_{it} \ldots\ldots (1)$$

The association between SP and ROE has been measured through the following model:

$$ROE_{it} = \beta_o + \beta_1 ROE_{it-1} + \beta_2 SP_{it} + \beta_3 SP_{Ecoit} + \beta_4 SP_{Envit} + \beta_5 SP_{Socit} + \beta_6 FS_{it} + \beta_7 TDTA_{it} + €_{it} \ldots\ldots (2)$$

Where;

ROA_{it} *= Return on Assets of firm i at time t*

ROE_{it} *= Return on Equity of firm i at time t*

SP_{it} *= Sustainability Performance of firm i at time t*

SP_{Ecoit} *= Economic Sustainability Performance of firm i at time t*

SP_{Envit} *= Environmental Sustainability Performance of firm i at time t*

SP_{Socit} *= Social Sustainability Performance of firm i at time t*

FS_{it} *= Size of firm i at time t*

$TDTA_{it}$ *= Total Debt to Total Assets of firm i at time t*

$€_{it}$ *= error term*

Measurement of Variables

The measurement of variables is given below in detail.

Measurement of Dependent Variable

Earlier studies by Ali et al. (2022); Farooq and Ahmad, (2023); and Naeem et al. (2024) used ROA, ROE, earning per share and Tobin's q to measure FP. So, this study used proxies ROA and ROE to measure FP. Net income divided by total assets yields ROA, while net income divided by total equity yields ROE.

Measurement of Independent Variable

The Independent variable used in this study is SP. SP is measured through content analysis of annual reports rather than the data collection through questionnaires. Questionnaire data depends on respondent behavior and mood. So, SP is measured through GRI 39 dimensions (8 for economic, 17 for environmental, and 14 for social) in dummy form. If the indicator is mentioned then assign otherwise 0 after this, we created the index of these indicators by using this formula:

Index= No of items disclosed / Total item on an indicator.

This methodology is aligned with Alam and Tariq (2023) and Zhou et al. (2024).

Measurement of Control Variable

Some control variables (FS, and TDTA) have been added to the regression model to increase its quality. These variables are added because they affect FP (i.e. when any firm has more resources it can work on its performance and another side when firms more rely on debt ultimately their performance is affected). FS is calculated as the natural logarithm of total assets. According to this viewpoint, businesses with higher log or assets are anticipated to produce higher performance than lower assets firms. Finally, TDTA is calculated by dividing the total debt by the total assets of the firm. Ali et al. (2022); Farooq and Ahmad (2023), and Naeem et al. (2024) used these variables in their studies.

The data analysis, which includes descriptive analysis, correlation, and regression is presented in the section that follows as a conclusion to the findings.

Results

The GMM model is used to analyze the relationship between the variables. The GMM model is better than the OLS regression model as well as a fixed effect and random effect model.

Descriptive Results

Table 1 Descriptive Result

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	520	0.54	0.39	-0.36	0.79
ROE	520	0.62	0.19	-.019	0.82
SP	520	0.59	0.11	0.49	0.74
SP_{Eco}	520	0.42	0.13	0.26	0.51
SP_{Env}	520	0.61	0.10	0.15	0.76
SP_{Soc}	520	0.70	0.23	0.51	0.97
FS	520	5.32	0.49	4.32	7.49
TDTA	520	0.51	0.19	0.15	0.78

Notes: *This table shows the descriptive statistics. In this result ROA shows return on assets, ROE is the abbreviation of return on equity. SP is sustainability performance, SP_{Eco} is sustainability economic performance, SP_{Env} is sustainability environmental performance and SP_{Soc} is sustainability social performance. While FS represents the firm size and TDTA to total debt to total assets.*

Table I summarizes the descriptive result of variables which contained mean, standard deviation, minimum, and maximum value. The mean values of ROA and ROE are 0.54 and 0.62 respectively. It shows that most firms utilize their resources properly and work on SP to improve FP. The mean value of SP is 0.59 percent. This suggests that the majority of the firms realize the importance of SP and working on it. The average value of SP in this study is bigger than those reported by certain writers in other developing countries (Mehboob et al., 2023), as they reported. The mean values of economic sustainability, environmental sustainability, and social sustainability are 0.42, 0.61, and 0.70 respectively. FS and TDTA mean values are 5.32 and .51 respectively.

Correlation and Variance Inflation Factor Result

Table II Correlation Result

Variables	SP	SP_{Eco}	SP_{Env}	SP_{Soc}	FS	TDTA
SP	1.000					
SP_{Eco}	0.07	1.000				
SP_{Env}	0.21	0.39	1.000			
SP_{Soc}	0.07	0.42	0.57	1.000		
FS	0.03	0.06	0.14	-0.02	1.000	
TDTA	-0.29	-.020	-0.19	-0.39	0.26	1.000

Table III Variance inflation factor

Variables	VIF	1/VIF
SP_{Eco}	1.49	0.67
FS	1.31	0.76
SP_{Env}	1.21	0.82
SP	1.18	0.84
SP_{Soc}	1.12	0.89
TDTA	1.06	0.94
Mean VIF	1.23	

Notes: *This table shows the correlation and VIF statistics. In this result ROA shows return on assets, ROE is the abbreviation of return on equity. SP is sustainability performance, SP_{Eco} is sustainability economic performance, SP_{Env} is sustainability environmental performance and SP_{Soc} is sustainability social*

performance. While FS represents the firm size and TDTA to total debt to total assets.

The correlation analysis of the study's variables is shown in Table II and VIF in Table III. The correlation result shows that the highest value is 0.57 among environmental sustainability and social sustainability. However, this value is less than the threshold of 0.70 (Farooq et al., 2023). VIF mean is also 1.23 which is lower than the threshold. This result indicates that no multicollinearity issue exists among variables.

Regression Result

Table IV Regression Result

Variables	**ROA**	**ROE**
Lagged of Dependent	0.382***	0.274***
	-0.016	-0.015
SP	0.550***	0.521***
	-0.034	-0.035
SP_{Eco}	0.386***	0.372***
	-0.016	-0.045
SP_{Env}	0.276***	0.413***
	-0.015	-0.055
SP_{Soc}	0.270***	0.086***
	-0.015	-0.010
FS	0.050	0.141***
	-0.034	-0.042
TDTA	-0.260***	-0.086***
	-0.021	-0.026
Constant	0.909***	0.861***
	-0.216	-0.262
Year dummy	Yes	Yes
Industry dummy	Yes	Yes
Observations	520	520
Wald Chi2	668.24	462.11
Hansen's test	0.41	0.85
AR(1)	0.017	0.002
AR(2)	0.62	0.71
No. of companies	65	65

Notes: *This table shows the GMM result. In this result ROA shows return on assets, ROE is the abbreviation of return on equity. SP is sustainability performance, SP_{Eco} is sustainability economic performance, SP_{Env} is sustainability environmental performance and SP_{Soc} is sustainability social performance. While FS represents the firm size and TDTA to total debt to total assets.*
The figures in parentheses are the standard errors.
**** p<0.01, ** p<0.05, * p<0.1*

Table IV shows the regression result of the variables. The result found a positive significant effect of SP and their dimensions on ROA and ROE. RBV supports these findings. It claims that those firms who use their resources, work for environmental protection and social enhances the image of firms. These things ultimately improve the performance of firms. All variables have a positive effect while TDTA negatively affects ROA and ROE. It indicates that when firms use more debt in their capital structure these things negatively affect their performance.

Results indicate that SP brings a 62% change in ROA and a 71% change in ROA. This result underlines the importance of seeing the interests of various stakeholders, including employees, customers, and society at great as well as economic and environmental factors. Therefore, SP and its dimensions play a role in shaping organizational dynamics, broader societal norms, and stakeholder pressures and also contribute significantly to advancing SDGs 2030. So all the hypotheses are accepted.

Conclusion

The purpose of this research was to examine how SP affects FP. Our results provide a new context and a deeper understanding of the differences found in previous studies (Trumpp et al., 2015). As shown in Table IV, our results confirm previous findings (Nollet et al., 2016) and show that SP dimensions have a favorable effect on FP. Our study closes this gap by providing empirical data. We offer a new set of measures intended to more accurately reflect the sustainability efforts of enterprises in all SP dimensions. These data, according to our models, will support our theory. While other studies that evaluate SP in terms of transparency have shown contradictory results, the SP characteristics do have a significant impact on FP when examined in terms of performance (Hussain et al., 2018). Notably, our research demonstrates that the inclusion of our variables greatly increases the models' overall explanatory power, and the coefficients differ significantly based on the particular sustainability aspect under investigation. We call for further development of the SP framework in light of these facts. We draw the conclusion that the methodology used to measure SP is crucial and can provide more definitive information on the nature of the connection between FP and sustainability engagement. Our findings further highlight the necessity of reassessing and realigning the SP dimensions.

Our findings demonstrate that a concentration on sustainable development goals is the only way to fully realize the impact of a major commitment to sustainability goals, irrespective of the degree of transparency. The RBV's concepts are supported by these results. Moreover, our data support the Porter hypothesis by showing that real dedication to SP has positive outcomes. These results are consistent with those of Alam and Tariq (2023); Gómez-Bezares et al. (2017); Pätäri et al. (2012); and Zhou et al. (2024) who found that to achieve a range of performance targets, organizations should incorporate sustainability into their strategic planning and raise their investments in social and environmental performance. Furthermore, we conclude that businesses that prioritize sustainability, particularly well-known ones outperform their competitors.

Our research has significant policy implications for all stakeholders (managers, owners, directors, and shareholders). Through SP they increase the FP of firms and also get more market shares. The firm’s managers and directors by following these implications protect the environment and become responsible firms to adopt these guidelines. Moreover, given our discoveries on the connections among different SP dimensions and sub-dimensions, we suggest conducting additional research both globally and in developing or rising economies. We think that managers and policymakers can get important insights from a more thorough analysis of SP sub-dimensions.

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