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[ENVIRONMENTAL MANAGEMENT PRACTICES AND SUSTAINABLE BUSINESS PERFORMANCE: THE MODERATING ROLE OF INSTITUTIONAL OWNERSHIP]

Muhammad Zain ul Abidin*
PhD Scholar Lahore Business School,The University of Lahore, Lahore, Pakistan. zain_lbs@hotmail.com
Rizwan Ali
Associate Professor Lahore Business School The University of Lahore. Rizwan.ali@lbs.uol.edu.pk
Ramiz Ur Rehman
Lecturer in Accounting & Finance, Teesside University International Business School, Teesside University, Middlesbrough, UK. R.Rehman@tees.ac.uk
Sheikh Khurram Abid
PhD Scholar Lahore Business School The University of Lahore, Lahore, Pakistan. Skabid99@hotmail.com

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ABSTRACT

This study considers the impact of environmental management practices on sustainable business performance and how the interaction of institutional ownership affects this relationship. The study covers ten years span and the data period ranges from 2013 to 2022. The non-financial firms of the FTSE 100-index listed on London stock exchange (LSE) are considered for this research as UK is the leading economy in adoption of environmental initiative. This research used the literature recommended regression methodologies and techniques to test the hypothesis of this study. The empirical estimation reveals that the environmental management practices (EMPs) play a significant role in sustainable business performance impacting and this relationship is further strengthened by moderating role of Institutional ownership. Results of this study show that environmental management practices are associated with both the financial and non-financial business performance measures. Therefore, the adoption of these activities provides competitive advantage and more stakeholder engagement by addressing the social and environmental concerns along with financial goals. The firms of developed economy of UK are considered in this research to establish the impact of environmental management practices (EMPs) on sustainable business performance. This will extend the business strategy and sustainability literature by establishing the importance of these practices in financial, social and environmental performance that gives a more holistic view regarding the significance of these practices.

Key words: Environmental management practices, sustainable business performance, institutional ownership

Introduction

Strategic value of incorporating environmental management practices into business operations has increased due to environmental concerns (Haque and Ntim, 2018, 2020). The substantial impact of industrial activity on environmental deterioration has ignited continuous discussions among academics in business, management, and strategic disciplines. Prior studies (Aslam, Elmagrhi, Ur Rehman, and Ntim, 2021; Elmagrhi et al., 2019; Dang et al., 2019; Shahab et al., 2018, 2019, 2020; Bhattacharyya and Cummings, 2015) emphasize that in the modern complicated global corporate environment, sustaining competitive advantages and viability is progressively difficult without addressing environmental issues and the demands of various stakeholders. Environmental management practices (EMPs) include organizational frameworks, planning activities, responsibilities, procedures, processes, and resources committed to the development, implementation, achievement, review, and maintenance of environmental policies (ISO 14001). Organizations may voluntarily adopt effective environmental practices to get competitive advantages, such as acquiring vital resources or achieving legitimacy by garnering community acceptance (Al-Shaer and Zaman, 2016; Cong and Freedman, 2011). The inclusion and implementation of environmental management practices are considered to have an impact on the business, environmental, and social performance of the firms. (Xue et al., 2020; Chen et al., 2018; Melnyk et al., 2003).

In essence, the journey toward corporate sustainability entails fostering environmental, social, and economic value in the long run via strategies, business frameworks, investments, and tools rooted in sustainability (Mio et al., 2022).

The existing literature (Haque & Ntim, 2018, 2020; Orazalin, 2019; Dahlmann et al., 2019) finds that the sustainable business performance of a firm is gauged by its effectiveness in three areas: financial, environmental, and social performance. Excelling these metrics signifies a firm's sustainability. Proactively adapting business processes becomes essential when companies recognize that environmental and social objectives can lead to cost savings and bolster their competitive edge (Carroll & Shabana, 2010). However, addressing sustainability concerns isn't a solo endeavor; collective action is crucial to weave environmental and social factors into economic choices (Seuring & Gold, 2013). There's an observed positive shift in businesses as they synchronize their financial outcomes with social and environmental metrics, defining this alignment as sustainable business performance (Chin et al., 2015). Many previous studies have viewed corporate environmentalism through an economic lens, questioning if sustainable practices are economically beneficial (Christmann, 2000; Jiang et al., 2018). Recently, some scholars have shifted the focus from traditional financial performance to protective measures against financial downturns, suggesting that firms' environmental commitments can serve as a shield against financial uncertainties (Mio et al., 2022; Chenet et al., 2021; Godfrey et al., 2009). Hence, to examine the sustainable corporate performance aspect this study considered the concept of sustainable business performance to explore the link between environmental management practices and firm outcomes, using financial, environmental, and social performance variables.

Empirical evidence suggests that implementing EMPs may greatly enhance organizational efficiency and profitability (Aslam et al., 2021). This is achieved by reducing operating costs, particularly through the reduction of waste in manufacturing processes (Gull et al., 2022). Moreover, there is a need to emphasize maintaining a long-term dedication to reducing carbon emissions (Dahlmann et al., 2019) as it may have a positive impact on a company's sustainable business performance. This is achieved via the establishment of stronger relationships with key stakeholders and the attainment of a competitive advantage. Further, the firms aim to enhance their societal legitimacy and efficiency by adhering to institutional norms, particularly environmental regulations (Ntim & Soobaroyen, 2013a; DiMaggio & Powell, 1983). Their importance increases because the issues concerning to environment pose a legitimacy threat to the business and are believed as the main source of risk and uncertainty for all businesses (Xue & Bai, 2020). Donations a proxy measure of social performance are also used as a fire-surpassing approach against environmental practices (Wu et al., 2021). Certain companies have utilized charitable donations as a cost-effective strategy to cultivate a socially respected public image or gain favorable public sentiment. (Koehn & Ueng, 2010). This assertion has particular validity in instances where organizations encounter the potentiality of environmental scandals. According to the study conducted by Williams and Barrett (2000), it has been seen that instances of non-compliance with environmental or occupational safety and health rules can result in damage to a company's reputation.

The previous studies covering environmental and business performance are more prone to finding the on the direct path. However, such studies concluded with mixed findings, including positive, negative or no relation between the variables of interest (Mallin et al., 2014; Prado- Lorenzo et al., 2010; Rao et al., 2012; Brammer & Pavelin, 2008; Cormier & Magnan, 2003; Qiu et al., 2016). Institutional ownership influences how resources are deployed and valued within an organization. According to the resource-based perspective, the degree to which EMPs are included into the overall business strategy of the company determines its strategic value; so, the ownership structure affects this degree of integration. The study of how various types of owners impact diverse environmental sustainability outcomes has garnered significant interest, perhaps due to its logical progression from the larger corporate governance literature. This research primarily examines the institutional ownership moderating role in EMPs and sustainable business performance relationship.

This study offers several contributions to extend the literature on business startegy and corporate enviroenmentalism. Firstly, previous research considered the EMPs realtionship with financial and enviroenmental performance but a more holistic view covering financial, social and envirnmental aspect is not studied and performance is these three areas is important in achieveing sustainable business performance. Secondly, this study explores the moderating role of institutional ownership on the relationship between EMPs and financial, social as well as environmental performance because the effectiveness of EMPs as a strategic resource depends on how well they are integrated into the firm's overall strategy, which is in turn influenced by the ownership structure

Thirdly, Aslam et al. (2021) highlighted that previous measurements of EMPs faced significant issues related to construct validity. To address this gap, the present research utilized a comprehensive scale comprising five sub-dimensional EMPs, developed by Trumpp et al. (2015). This scale effectively resolves the construct validity problem and offers a more accurate measure of EMPs. Notably, this measurement approach has not been previously employed in validating the relationship between EMPs and sustainable business performance, thereby providing a unique contribution to the literature considering contextual settings.

Rest of the paper is structured as follows; section 2 will comprise of literature review and hypothesis development; the research methordolgy is addressed in section 3; results are presented and explaind in section 4; section 5 is about summary and conclusion.

Literature review and hypothesis development

Resource-Based View

The resource-based view (Hart, 1995) contends that a proactive environmental strategy can help businesses build moral capital or goodwill (Trumpp & Guenther, 2017), which could give them a competitive advantage (Clarkson et al., 2011; Sharma & Vredenburg, 1998). Therefore, allocation of resources according to adopted environmental practices boost business profitability and increase sustainable business performance. This justifies the study stance that only considering the implementation of these practices through the lens of environmental and financial performance is not a good strategy. It is important to consider the EMP's relation to sustainable business performance. Further to study the monitoring

role and associated factors this study considers the interacting effect of ownership structure and corporate governance mechanism.

Environmental Management Practices and Sustainable Business Performance

The use of environmental management strategies in business is a growing global trend. Researchers are investigating these in relation to business and environmental performance to identify the elements that drive their adoption (Aslam et al., 2021; ; Shahab et al., 2020; Agyabeng-Mensah et al., 2020). The past research attempts to support this by means of many theoretical models combining institutional theory with resource-based perspective as the organisations are driven to raise their legitimacy and efficiency, which may also result in a competitive advantage. Though the results are varied, it suggests that companies might beat competitors by optimising their internal processes and being acknowledged by outside stakeholders (Aguilera et al., 2021; Elmagrhi et al., 2019). Therefore in this study, sustainable business performance is considered to measure financial and non-financial aspects of performance in a single model. This sustainable business performance has three important factors which include firm performance, environmental performance, and social performance. (Mio et al., 2022). The first factor is environmental performance which is the degree to which businesses may make good use of their resources to minimise the negative effects of their operations on the surroundings. This means taking steps to support environmental sustainability by lowering air pollution, cutting the use of dangerous materials, avoiding environmental accidents, and so saving and optimizing resourses and enegy (Agyabeng-Mensah et al., 2020).

The second element is social performance, which is the act of using environmental initiatives to execute policies protecting society and enhancing employee well-being, therefore strengthening the reputation of a company. These issues include not only incentives and pay but also educational access and trainings, health and safety issues (HS), access of having equal opportunities, child labour, freedom of association, forced labour, human rights and services (Vallance et al., 2011). Poxy of donation used in past literature as a social performance measure (Brammer & Millington, 2008; Jia & Zang, 2012). This also has a dark side, as reaserched by Wu et al. (2021) from a Chinese viewpoint revealed that some businesses have used social performance as a preventive approach and a means of fire-suppression for window-dressed environmental misbehaviour. Using charity/donations gifts as a somewhat low-cost approach to develop a cost-effective plan to generate a socially respected public view or to gain favourable public mood, companies found This claim has especially relevance in cases where companies run into the possibility of environmental problems. This reveals an adverse link between social performance of a company and its environmental policies. The researcher suggested to verify this relationship in other contexts in order to improve the body of knowledge even further.

Lastly, the third dimension is financial performance. Financial performance refers to the degree to which a company's tangible and intangible financial and nonfinancial assets can accomplish certain financial objectives established by the organization. The main reason for the foundation of a profit-making organization is crucial as it serves as a vital determinant for the organization's success. The research utilized Tobin's Q, return on equity, return on

assets, and other relevant metrics due to their data availability and their significance in determining the purpose of a business (Li et al., 2018).

The current research demonstrates an inconsistency in the relationship between corporate environmentalism and performance. Aslam et al., 2021 found positive association. Klassen and McLaughlin (1996) identified a significant negative correlation. Additionally, a study by Mahapatra (1984) demonstrated a negative correlation between corporate environmental practices and business performance, particularly when utilising a larger sample size than that of Williams and Barrett (2000). It was observed that non-compliance with environmental or occupational safety and health regulations can adversely affect a company's reputation. So, this study proposes the hypothesis that:

Hypothesis 1: *There is a positive association between environmental management practices and sustainable business performance covering: (a) financial performance (b) environmental (c) social performance.*

Interaction effect of Institutional Ownership

Research by Orazalin (2020) proposed that the forthcoming research in the realm of sustainability could further enrich existing knowledge by considering the influence of corporate governance internal as well as external frameworks on corporate sustainable performance. On the other hand, ownership structure influences how resources are deployed and valued within an organization. In the resource-based view, the effectiveness of environmental management practices as a strategic resource depends on how well they are integrated into the firm's overall strategy, which is in turn influenced by the ownership structure. The role of ownership structure in the context of monitoring is instrumental in the adoption of EMP by managers in the firm performance. The study of how various types of owners impact diverse environmental sustainability outcomes has garnered significant interest, perhaps due to its logical progression from the larger corporate governance literature. This research primarily examines the predominant category of institutional ownership (Aguilera et al., 2021). There are strong theoretical reasons why the majority investors may prefer higher levels of investment in company environmental performance. Consequently, the institutional ownership structure has an interactive role in environmental management practices and sustainable business performance. Many studies related to the environment and governance literature explored the direct association between a firm's and environmental performance and financial performance. Nevertheless, the results of these research were inconsistent, including positive (Aslam et al., 2021; Mallin et al., 2014), negative (Rao et al., 2012) or no (Qiu et al., 2016; Ahmad et al., 2015; Walls et al., 2012) relationship connecting these variables of interest. A significant weakness of these studies is their neglect of the moderating role of institutional ownership on this relationship, Resultantly the current study proposed to study the moderating role of institutional ownership in EMP and sustainable business performance.

Therefore this study hypothesize that:

Hypothesis 2: *Institutional ownership moderates the relationship between environmental management practices and sustainable business performance*

Methodology

Sample Selection

This study has four major variable categories. The explanatory variable of EMPs measured by a 31-item scale index and environmental and social aspect of dependent variable; sustainable business performance is sourced from Refinitiv's EIKON database, a significant repository of environmental, social, and governance characteristics. Financial performance control variables are extracted from the Worldscope database. The institutional ownership obtained from the available data on the Bloomberg database. The sample comprises non-financial publicly traded companies from 2013 to 2022. We omitted the companies related to the financial category from our sample due to their distinct regulatory frameworks and unique financial features. After the elimination of financial institutions our final sample consists of 770 firm-year observations. The methodology for sample selection is detailed in Table 1.

Table 1. Sample Description:

Sample selection procedure	
Initial observations of all FTSE-100 firms from 2013 to 2022	1000
Less: firm observations of financial firms	230
Final sample	770

Note: The table reports the sample selection procedure used in the study.

Variable Measurement

We measured the independent variable of this study using the 31-item measurement scale as introduced by the Trump et. al., (2015) which is used in the latest researches (Aslam et. al., 2020; Xue, Zhang, & Li, 2020). In the existing literature the researchers (Haque & Ntim, 2018, 2020; Orazalin, 2020; Dahlmann et al., 2019) the sustainable business performance of a firm is gauged by its effectiveness in three areas: financial, environmental, and social performance. Therefore, Tobin's Q is used as a financial performance measure, for social performance the proxy of donations is used and proxy of carbon emissions represent the environmental performance. Past studies found the endogeneity issue in studies that considering environmental management practices and sustainable business performance (Benlemlih, Arif, & Nadeem, 2023; Aslam, Elmagrhi, Ur Rehman, and Ntim, 2021). Therefore, this study considers control variables like firm age, leverage and cash holding which are commonly used in previous research as control variables (Al-Najjar and Abualqumboz, 2023; Francoeur et al., 2021). Table 2 shows the measurements and nature of all the study variable used in this paper.

Table 2. Variable and Measures

Variables	Symbols	Expected Sign	Description
Dependent Variable			
Financial Performance	TbQ	+	Outstanding shares market value + total liabilities divided by total assets. (Aslam et al., 2020)

Social Performance	SP	+	Total Charitable Donations (Haque & Ntim, 2018; Orazalin, 2019)
Environmental Performance	EP	+/-	Carbon Emissions (Total carbon emissions (nlog) further details. (Samsul et al., 2019)
Independent Variable			
Environmental Management Practices	EMPS	+	Environmental management practices are calculated by adding 31 dummy variables that measure a firm's engagement in environmental practices. Therefore, the minimum score of 0 to a maximum of 31. See Annexure 1 for further details. (Trumpp et al., 2015; Xie and Hayase, 2007)
Moderating Variable			
Institutional Ownership	Inst_Own	+	%age of shares held by institutional shareholders (Benlemlih, Arif, & Nadeem, 2023)
Control Variables			
Firm Age	f_age	+/-	Age of the Firm Hashmi and Iqbal, 2022; Martínez-García et al., 2021
Firm leverage	Lev	+/-	Percentage of Total Debts to Total Assets Nguyen, 2021
Cash Reserves	Cash	+/-	Cash and cash equivalent (CHE), scaled by total assets Cori et al., 2017

Econometric Models

Keeping in view the endogeneity issues highlighted in the previous literature (Benlemlih, Arif, & Nadeem, 2023; Aslam, Elmagrhi, Ur Rehman, and Ntim, 2021) studing the EMPs relationship with financial and non-financial performance measures the advance stataistical methods such as the Generalized Method of Moments (GMM) are recommended in the literature. Therefore, these are used in this study to test the study hypothesis.

In the first stage the present study will evaluate the association between EMPs and sustainable business performance, which covers the performance in financial, social and environmental context, using equation 1a, 1b and 1c.

$$\sum_{i=1}^{3} Sus\_Bus\_Perf = \alpha + \sum_{i=1}^{5} \beta_1 EMPs_{i,t} + \sum_{k=1}^{5} \beta_2 Controls_{i,t} + \epsilon_{i,t} \text{----------} \textbf{equation 1}$$

$$TbQ = \alpha + \sum_{i=1}^{5} \beta_1 EMPs_{i,t} + \sum_{k=1}^{5} \beta_2 Controls_{i,t} + \epsilon_{i,t} \text{----------} \textbf{equation 1a}$$

$$SP = \alpha + \sum_{i=1}^{5} \beta_1 EMPs_{i,t} + \sum_{k=1}^{5} \beta_2 Controls_{i,t} + \epsilon_{i,t} \text{----------} \textbf{equation 1b}$$

$$EP = \alpha + \sum_{i=1}^{5} \beta_1 EMPs_{i,t} + \sum_{k=1}^{5} \beta_2 Controls_{i,t} + \epsilon_{i,t} \text{----------} \textbf{equation 1c}$$

In the second stage this study will evaluate the moderating role of institutional ownership between EMPs and sustainable business performance using equation 2a, 2b and 2c.

$$\sum_{i=1}^{3} Sus\_Bus\_Perf = \alpha + \sum_{i=1}^{5} \beta_1 EMPs_{i,t} + \sum_{i=1}^{5} \beta_2 EMPs_{i,t} * Inst\_Own + \sum_{k=1}^{5} \beta_3 Controls_{I,t} + \epsilon_{I,t} \text{----------} \textbf{equation 2}$$

$$TbQ = \alpha + \sum_{i=1}^{5} \beta_1 EMPs_{i,t} + \sum_{i=1}^{5} \beta_2 EMPs_{i,t} * Inst\_Own + \sum_{k=1}^{5} \beta_3 Controls_{i,t} + \epsilon_{i,t} \text{----------} \textbf{equation 2a}$$

$$SP = \alpha + \sum_{i=1}^{5} \beta_1 EMPs_{i,t} + \sum_{i=1}^{5} \beta_2 EMPs_{i,t} * Inst\_Own + \sum_{k=1}^{5} \beta_3 Controls_{i,t} + \epsilon_{i,t} \text{----------} \textbf{equation 2b}$$

$$EP = \alpha + \sum_{i=1}^{5} \beta_1 EMPs_{i,t} + \sum_{i=1}^{5} \beta_2 EMPs_{i,t} * Inst\_Own + \sum_{k=1}^{5} \beta_3 Controls_{i,t} + \epsilon_{i,t} \text{----------} \textbf{equation 2c}$$

whereas EMPs is the independent variable of the study; TbQ, SP and EP are the dependent variables; αi,t model's intercept; institutional ownership (Inst_Own) is the moderator; control variables of firm age (f_age), Leverage (Lev) and cash reserves (Cash) are also considered in this; β1–β2 are independent variables, moderator, interaction term, control variables regression coefficients, s and εi,t is the error term and i represents firm at time t.

Results

Descriptive Statistics

The descriptive statistics of the study variables from FTSE 100 are summarized in Table 4.1. This includes the three independent variables TbQ, SP and EP, representing sustainable business performance. The TbQ value ranges from a minimum value of 0.39 to a maximum of 2.44, with a mean value of 1.06 and a standard deviation of 0.65. This variability represents the market value difference between the sample set of the firms. The mean value is above one this means that most the FTSE 100 firms have market value is more than the value of balance sheet assets. The social performance (SP) of 720 observed value has a mean of 14.52 and standard deviation of 2.50. Environmental performance (EP) has a mean of 11.97 with a standard deviation of 2.82 and its value ranges between 3.84 to 18.27. This reflects the

different levels of commitment and effectiveness in addressing the impact of environmental impact

In terms of control variables, the average firm age (f age) stands at 3.935, the average cash holdings (Cash) are at 12.46, and the average leverage (Lev) is recorded at 125. The descriptive statistics reveal significant variability in the leverage data, featuring a standard deviation of 1864 and values that span from 0.37 to 3766.

Table 3: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
TbQ	770	1.06	0.65	0.39	2.44
SP	720	14.52	2.50	7.80	21.89
EP	770	11.97	2.82	3.84	18.27
EMPS	770	19.53	8.71	0	31
Inst_Own	660	0.83	0.13	0.35	0.95
f age	770	3.96	0.97	-	5.73
Cash	770	12.46	1.821	6.55	17.18
Lev	745	125	1,864	0.370	37,665

Correlation Matrix

The Pearson correlation coefficients of all the study variables are presented in Table 4.1, 4.2 and 4.3. The findings reveal the EMPs have a negative but significant correlation with TbQ (-0.125) and EP (-0.654). This reflects that more allocation of resources towards sustainable activities resultantly have negative impact on performance but the increase in EMPs means the reduction of carbon emissions therefore the relationship is negative. Moreover, there exists a notable positive relationship between EMPS and SP (0.660) which means that these activities has more holistic approach as along with environment these contributes towards social wellbeing of the society and increase the corporate reputation. Further the institutional ownership has shown positive association with TbQ, SP and EP suggesting that higher institutional ownership may drive better financial performance, social and environmental performance.

f_age has significant and positive correlation with TbQ (0.068), EP (0.252) and SP (0.248). Cash has negative association with TbQ (-0.073) but there exist significantly positive association with SP (0.374) and EP (0.405) while the correlation with Lev is not significantly associated with any of the sustainable performance measure.

Table 4.1: Correlation Statistics

Variables	TbQ	EMPS	Inst_Own	f_age	Cash	Lev
TbQ	1					
EMPS	-0.125***	1				
Inst_Own	0.175***	0.061	1			
f_age	0.068*	0.302***	0.0199	1		
Cash	-0.073**	0.291***	-0.0720*	0.143***	1	
Lev	0.027	0.025	-0.0223	-0.021	-0.019	1

*** p<0.01, ** p<0.05, * p<0.1

Table 4.2: Correlation Statistics

Variables	SP	EMPS	Inst_Own	f_age	Cash	Lev
SP	1					
EMPS	0.660***	1				
Inst_Own	0.010	0.061	1			
f_age	0.248***	0.302***	0.0199	1		
Cash	0.374***	0.291***	-0.0720*	0.143***	1	
Lev	-0.025	0.025	-0.0223	-0.021	-0.019	1

*** p<0.01, ** p<0.05, * p<0.1

Table 4.3: Correlation Statistics

Variables	EP	EMPS	Inst_Own	f_age	Cash	Lev
EP	1					
EMPS	-0.654***	1				
Inst_Own	0.0016	0.061	1			
f_age	0.252***	0.302***	0.0199	1		
Cash	0.405***	0.291***	-0.0720*	0.143***	1	
Lev	-0.055	0.025	-0.0223	-0.021	-0.019	1

*** p<0.01, ** p<0.05, * p<0.1

Regression Results

Endogeneity presents a potential challenge when analyzing the relationship across EMPs and performance measure like financial, social and environmental performance (Aslam el al., 2021; Benlemlih, Arif, & Nadeem, 2023). This can raise doubts about the accuracy and trustworthiness about the result derived from such analysis. In order to deal with the problems of estimation bias, endogeneity and heterogeneity the best available statistical tool is the System Generalized Method of Moments (GMM) estimator (Ullah, Akhtar, and Zaefarian., 2018; Ullah, Zaefarian, and Ullah, 2020). Furthermore, the two-step GMM model helps to reduce needless data loss (Ullah et al., 2018). In line with accepted literature of environment (Al-Tuwaijri et al., 2004; Anton et al., 2004; Haque and Ntim, 2018), we therefore addressed any possible endogeneity and reverse causality concerns in estimating all the research models using the dynamic two-step system GMM model.

The hypothesis H1 estimates the impact of EMPs on sustainable business performance, and we run two step system GMM regression technique to test this hypothesis. First of all the we predicted the impact of EMPs on financial performance measured using Tobin's Q and results are presented in table 5.1, model 1 clearly show that EMPs has significant positive relationship with TbQ ($\beta = 0.0155$; $p < 0.05$). This means that the allocation of firm resources for adoption of EMPs will increase the firm's performance. These findings demonstrate that when companies sincerely commit to these practices, it improves their operational efficiency,

which in turn improves their financial performance. This is because operational costs are reduced, and utilization of resources is optimized. According to a resource-based theoretical viewpoint (Russo & Fouts, 1997), good environmental management practices can boost a company's financial performance, reputation, and growth prospects via improved connections with important stakeholders and an improved public perception of the company (Alhossini, Ntim, & Zalata, 2021; Famiyeh et al., 2018). These results are consistent with the study hypothesis as well as previous literature that evidence the adoption of these practices boost the financial performance of the firm (Aslam et al., 2021; Shahab et al., 2020). The model 2 of table 5.1 represents the significant positive relationship of EMPs with social performance ($\beta = 0.026$; $p < 0.05$) which is the second measure of sustainable business performance. This study provides unique evidence that EMPs not only leads an organization responsible toward environmental aspect but also increase organizational focus to be socially responsible. As the two step system GMM technique used to estimate results therefore to check the serial autocorrelation problem AR (2) p-values is considered and this value is insignificant, implying that there is no serious serial autocorrelation problem in our model. This model also passes the Hansen J test for the over-identifying restrictions. Furthermore, the positive impact of EMPs on social performance aligns with the literature suggesting that prioritizing environmental sustainability fosters better relationships with stakeholders and communities, thereby enhancing social outcomes (Javed & Husain, 2021; Cannas, Dallocchio, & Pellegrini, 2022). This study highlights the importance of manufacturing environmental practices in improving social performance, which is crucial for employee wellbeing, human development, and overall quality of life—an area that lacks substantial empirical evidence (Karia & Davadas Michael, 2022).

Results of EMPs impact on environmental performance are presented in model 3 of table 5.1. The regression results estimated the negative and significant relationship ($\beta = -0.001$; $p < 0.05$). The negative co-efficient between EMPs and environmental performance relationship—signified by a reduction in carbon emissions—aligns with existing literature (Hassan & Romilly, 2018; Moussa et al., 2020). This outcome supports the core principles of resource-based-view and institutional theories, which argue that implementing EMPs reduces the risk to the environment. These outcomes affirm the success of EMPs in achieving anticipated environmental outcomes and are consistent with previous research (Arda et al., 2019; Aslam et al., 2020; Famiyeh et al., 2018; Hartmann & Vachon, 2018; Moussa et al., 2020). This also evidenced that UK firms are not using EMPs as fire-surpassing tool to cover the environmental misconduct as found by Wu et al. (2021) in a Chinese perspective.

In order to empirically estimate the moderating role of institutional ownership, we used the two-step system GMM based regression and the empirical results of are presented in table 5.2. Under hypothesis H2 in this study we hypothesized that the environmental management practices (EMPs) in the presence of institutional ownership increase the sustainable business performance. We argue that resource allocation based on implemented environmental practices enhances firm profitability and elevates sustainable business performance. This confirms the position that evaluating the implementation of EMPs only from the perspectives of environmental and financial performance is an inadequate

approach. It is crucial to evaluate the EMP's connection to sustainable company success. This research examines the monitoring role and related elements, focusing on the interactive influence of ownership structure specially the institutional ownership.

The model 1, 2 and 3 of table 5.2 represents of EMPs and institutional ownership interaction on each category of sustainable business performance covering firm performance, social performance and environmental performance. The interaction result shown positive impact of institutional ownership moderating role on financial (TbQ: β= 0.1639, p <0.01), social (SP: β= -0.070, p <0.1) and environmental performance (EP: β= -0.044, p <0.01) in this study involving UK based top 100 firms. These findings predict that institutional ownership influences the EMPs which results in a enhancing sustainable business performance. These results are consistent with the previous literature (Benlemlih, Arif, & Nadeem, 2023; Dyck, Lins, Roth, & Wagner, 2019) and fills the gap of the literature that the effectiveness of environmental management practices as a strategic resource depends on how well they are integrated into the firm's overall strategy, which is in turn influenced by the institutional ownership.

The table 6 present the summary of study interaction hypothesis H2a -H2c. This study fully accepts the hypothesis H2a and H2c which means that interaction of institutional ownership and EMPs results in increasing financial performance as well as this improves the environmental performance by reducing carbon emission. The interaction found a negative association with social performance which means that institution ownership gives more importance to environmental and financial performance those are crucial for achieving growth and sustainable competitive advantage. Therefore, the H2b is rejected.

Environmental Management Practices and Sustainable business performance

Table 5.1: GMM Regression Results -2STEP

Variables	**(1)**	**(2)**	**(3)**
	TbQ	**SP**	**EP**
Frist lag of dependent variable	0.721***	0.850***	0.992***
	0.0038	(0.003)	(0.001)
Independent variable			
EMPS	0.0155***	0.026***	-0.001***
	0.0022	(0.001)	(0.000)
Control variables			
f_age	0.048***	0.032***	-0.007***
	0.021	(0.001)	(0.002)
Cash	-0.172***	0.000***	-0.000***
	0.0097	(0.000)	(0.000)
Lev	-0.0009***	-0.000***	0.000***
	0.000	(0.000)	(0.000)
Constant	1.867***	1.531***	0.120***
	0.1124	(0.065)	(0.021)
Year effects	Yes	Yes	Yes

AR(2): *p-value*	0.958	0.533	0.235
Hansen's J : *p-value*	0.737	0.423	0.153
Observations	667	629	669
Number of Instruments	42	50	47
Number of Firms	77	77	77

Moderating Role of Institutional Ownership between EMPS and Sustainable business performance

Table 5.2: GMM Regression Results -2STEP

Variables	**(1)**	**(2)**	**(3)**
	TbQ	**SP**	**EP**
Frist lag of dependent variable	0.720***	0.8284***	0.976***
	0.0017	0.0157	0.0014
Independent variable			
EMPS	-0.0465***	0.0690***	0.0195***
	0.0047	0.0142	0.0021
Inst_Own	-2.012***	1.589*	1.186***
	0.3434	0.8614	0.198
EMPS*Inst_Own	0.1639***	-0.070*	-0.044***
	0.0135	0.035	0.0061
Control variables			
f_age	0.0335***	0.0429***	0.001
	0.0112	0.012	0.004
Cash	-0.120***	-0.118***	-0.017***
	0.0011	0.0137	0.0003
Lev	0.00006***	-0.0001***	0.000***
	0.000	0.00001	0.000
Constant	2.071***	2.364***	-0.012
	0.1347	0.41	0.073
Year effects	Yes	Yes	Yes
AR(2): *p-value*	0.884	0.376	0.236
Hansen's J : *p-value*	0.263	0.429	0.43
Observations	578	549	580
Number of Instruments	57	57	64
Number of Firms	77	77	77

Table 6: Summary of Empirical Results-Third Model of the study

Sr. No	Relationship	Hypothesis	Predicted Sign	Findings FTSE-100	Hypothesis Status
1	EMPS *Inst_Own→ TbQ	H2a	+	Sig+	Accepted
2	EMPS *Inst_Own→ SP	H2b	+	Sig-	Rejected
3	EMPS *Inst_Own→ EP	H2c	-	Sig-	Accepted

Summary and Conclusion

This study makes several novel perspectives to business strategy and environmental literature by examining the EMPs association with both financial and non-financial measures that give a more holistic performance viewpoint named as sustainable business performance. further the moderating role of institution ownership in EMPs and sustainable relationship also considered in this study. Using United Kingdom data comprising of FTSE-100 organizations and period from 2013 to 2022, our results demonstrate that EMPs positively impact financial, social and environmental aspects of sustainable business performance. We further find that the interaction of institutional ownership with EMPs increases financial and environmental performance but its relationship with social performance is negative. Our results align with the expectations of our theoretical framework, which is informed by resource-based views. The results of this research have significant implications for investors, managers, and governments.

The study's findings demonstrate that UK corporations have accepted the notion of environmental validity by adopting both voluntary and required corporate environmental management practices. The findings of this research indicate that the incorporation of continuous improvement in environmental programs is an effective strategy to address contemporary environmental concerns and attain sustainable business performance. Secondly, the outcome of this research indicated that the implementation of effective environmental programs not only enhanced the firm's reputation but also contributed to cost reduction and the attainment of competitive advantage. Third, institutional ownership correlates with enhanced implementation of practices aimed at achieving organizational sustainable performance objectives; thus, the results indicate that the interaction effect of institutional ownership is vital in elucidating the association between EMPs and sustainable business performance. The research indicates that investment in green and environmental concerns may favorably influence long-term financial benefits for investors. The outcome also has several ramifications for those responsible for developing policies. The worldwide target to achieve zero emissions has emerged as a significant topic for international media and press. The United Kingdom is a pioneer in the adoption of sustainable practices, illustrating to other industrial economies that rigorous corporate oriented legislation related to environment may facilitate the implementation of voluntary, thorough environmental objectives. Consequently, other economies would also benefits from adopting environment related norms as organization level like to those of the United Kingdom, which are likely to assist in addressing current climate concerns.

Similar to other enquiries, our analysis has certain limitations that could guide future research endeavors. This study's sample is only from the United Kingdom; hence, the results must be understood and generalized with caution. Subsequent research may enhance this work by sourcing samples from many nations, perhaps revealing factors pertaining to culture and location. Moreover, Albertini (2013) contended that the link between environmental, social, and financial performance is substantially affected by regional and sectoral variations. Secondly, despite our efforts to mitigate potential endogeneity issues, the magnitude and direction of our coefficients may still be affected by such problems. Alternative methodologies, including regression techniques of generalized two and three-stage least squares methodologies, can be employed to address the issues related to endogeneity. Furthermore, alternate measure of environmental proxy and social proxy other than carbon emission and donation are recommended to use in future researches for an alternate perspective. Nonetheless, including other factors linked to environmental and social performance enhances the robustness of the results. Future study may investigate the primary link within the cohort of major carbon emissions emitters corporation to mitigate self-reported sample bias. Future research may investigate the interactive role of other ownership types between relationships of EMPs and financial success, as well as environmental performance.

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