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CEO Financial Expertise and Firms Social and Environmental Performance: The Mediating Role of Environmental Management Practices

Muhammad Zain ul Abidin*
PhD Scholar, Lahore Business School, The University of Lahore, Lahore, Pakistan. Corresponding Author Email: zain_lbs@hotmail.com
Dr. Rizwan Ali
Associate Professor, Lahore Business School, The University of Lahore
Rizwan.ali@lbs.uol.edu.pk
Dr. 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

Abstract

Purpose: This study considers the impact of CEO financial expertise on social and environmental performance and the mediating role of environmental management practices in this relationship is also considered. Design/methodology/approach: The span of the research considered ten years' data ranges from 2013 to 2022 of non-financial firms of FTSE 100-index listed on London stock exchange (LSE). This research successfully applied previously defined regression methodology to test the hypothesis investigating the significance of CEO financial expertise. Findings: Empirical investigation reveals that the CEO financial expertise are not only associated with financial measures, but they also play a significant role in non-financial performance measures like environmental and social performance. The mediating role of environmental management practices has a positive impact in this relationship. Practical Implications: Results of this study show that among the other CEO attributes the CEO financial expertise is important in shaping the environmental and social profile of the company through allocation of resources by enhancing the environmental management practices. These factors are key contributors to companies' sustainable business performance, and a financial expert CEO is more aware of their long-standing impact. Originality/Value: In this study the firms of developed economy of UK are considered that range from multiple sectors to successfully establish the significance of CEO financial expertise in environmental and social performance and indirect effect played by the adoption of environmental management practices in shaping this relationship. This study tried to extend the CEO attributes and corporate environmentalism literature and validated the environmental management practices measure that is not previously used with the study variables.

Key words: CEO financial expertise, environmental performance, social performance and environmental management practices

Introduction

The upper-echelon perspective developed by Hambrick and Mason (1984), proposed that the attributes of a company's senior leadership team can partially predict the organization's strategic choices and overall business outcomes. As a result, the literature concluded that corporate success and performance is significantly linked with attributes of top management since their decisions are essential for achieving corporate goals. (Amin et al., 2023; Shen, 2021; Gupta et al., 2017). This illustrates how variations in cognitive views and attributes among executives or managers impact every step of the strategic decision-making process, covering issue identification (Dutton &

Duncan, 1987), search for information (Herrmann & Datta, 2002), corporate social performance (Petrenko et al., 2016), and the environmental performance (Albertini, 2013; Buertey et al., 2019).

Specifically, in this research we focused on one of the observable CEO attributes of financial expertise. This is one of the key attributes that contributes in CEO's decision making behavior. (Ali et al., 2022; Gupta 2022). According to Dieguez-Soto et al. (2022) this equips the CEOs with required knowledge which is important for strategic decisions like adoption of environmental management practices (Shahab et al., 2020; Musa, Abdul Latif, and Abdul Majid, 2023). These equip CEO with enough capabilities that are crucial for allocation of resources for organization success. Their financial acumen may help them to understand more effectively how the investors and stakeholders see companies with superior environmental performance as deserving of investment, eventually resulting in enhanced financial outcomes (Shahab el al., 2019).

Our study extends business strategy and corporate environmentalism literature by focusing on the relationship of CEO financial expertise with social and environmental performance. Further, we analyzed the mediating role of environmental management practices (EMPs) in this relationship. To perform this study, we collected the sample of 770 observations of UK based firms of FTSE-100 index during the period of 2013 to 2022. Our results found that CEO financial expertise is significantly and positively associated with social as well as environmental performance. This suggests that when CEOs have better financial skills then they have better decision-making authority, they are more likely to implement and prioritize environmental initiatives.

This study offers several contributions to extend the literature on CEO financial expertise in the context of their relationship with social and environmental performance and role of environmental management practices (EMPs) in this relationship. This study first addressed the gap identified by Shahab et al. (2020) by studying the relevance of the less-explored CEO characteristic of financial acumen in connection to social and environmental performance. Secondly, this research examined the influence of CEO financial expertise on the adoption of environmental management techniques, which are essential for long-term organizational effectiveness and sustainable company performance. Thirdly, the importance of environmental management practices, as emphasized by Aslam et al. (2021), is examined as a mediator between financial competence and social and environmental performance. This provides new insight for literature, indicating that a CEO's financial expertise enables more effective management and

strategic allocation of firm resources for environmental management activities, thereby improving both social and environmental performance, which are crucial for an organization's strategic and long-term growth.

Fourthly, the consideration of just non-financial performance metrics yields sustainable corporate success (Agyabeng-Mensah et al., 2020; Orazalin, 2019). Moreover, the social performance metrics of charity contributions are seen as a mitigating strategy to safeguard the organization's image in light of its declining environmental performance (Wu, Jin, Monfort, & Hua, 2021). Examining these individual models provides a more comprehensive perspective on the organization's approach to sustainability. The suitable metric for environmental management practices is a subject of ongoing discussion, and we used the measure suggested by Trump et al. (2015), which encompasses all facets of environmental practices (Aslam et al., 2021). The rest of the paper is structured as follows; section 2 will comprise of literature review and hypothesis development; the research methodology is addressed in section 3; results are presented and explained in section 4; section 5 is about summary and conclusion.

Literature Review and Hypothesis Development

Upper Echelon Theory

According to the upper echelon theory perspective, the top management of an organization is crucial for an organization’s strategic management process; their competence and attributes have an impact on both the financial and non-financial results. Among those the CEO is a top decision maker of an organization and plays a significant role in implementation of decisions involving sustainable business practices that lead towards better environmental and social performance. Previous studies suggest that the attributes of CEOs like financial expertise, can foster enhanced executive commitment to adhering to institutional regulations, thereby positively influencing environmental sustainability and performance and these are considered as key drivers of corporate sustainable business performance involving non-financial performance measures like environmental and social performance (Shahab et al, 2020; Ntim & Soobaroyen, 2013a, 2013b; Shahab, Ntim, Chengang, Ullah, & Fosu, 2018; Soobaroyen & Ntim, 2013). Therefore, in this research we pursued the observable attributes of CEO financial expertise; which is less researched but equally important for both financial and non-financial performance measures; like social and environmental performance.

CEO Financial Expertise; Environmental and Social Performance

CEOs educational background is believed to be an important factor that influences their behavior while making key business decisions of the organization (Ali et al. (2022). As the CEO is responsible for the firm's decisions, therefore the outcomes of the firm are dependent upon their education level (Gupta 2022). Accordingly financial knowledge is required at this level that provides necessary skills and expertise to make and execute strategic decision making (Diéguez-Soto et al., 2022). Human capital studies consider this superior human capital which provides a firm with sustainable business advantage and significantly impact firm performance (Crook, Todd, Combs, Woehr, & Ketchen, 2011). Previous studies indicate that the educational background of senior executives may significantly influence corporate behaviors and results. Although most research has concentrated on corporate outcomes such as financial performance and innovation, few researchers have examined the impact of educational backgrounds on a firm's non-financial metrics, including environmental and social performance (Liao & Wu, 2024; Lewis, Walls, & Dowell, 2014; Finkelstein et al., 2009).

Despite the importance of financial literacy, prior literature has examined other CEO characteristics such as political ideologies and connections (Chin, Hambrick, & Treviño, 2013; Marquis & Qian, 2014), moral and ethical conduct (Wu, Kwan, Yim, Chiu, & He, 2015), career paths (Oh et al., 2016), as well as confidence and narcissism (McCarthy et al., 2017; Petrenko, Aime, Ridge, & Hill, 2016), which have been found to significantly influence social, sustainable, and environmental performance. While the aforementioned literature illustrates the influence of individual backgrounds, experiences, and other observable traits of CEOs on sustainable and environmental performance, current studies have not examined the financial expertise of CEOs, a crucial attribute for the effective performance of upper echelons and environmental and social performance (Hambrick, 2007; Hambrick & Mason, 1984).

Firstly, we contend that the financial expertise of CEOs impacts on their personal beliefs, which may, in turn, influence the degree to which they engage in sustainable and environmentally responsible actions. Their financial acumen may help them to understand more effectively that investors and stakeholders see companies with superior environmental performance as deserving of investment, eventually resulting in enhanced financial outcomes (Shahab el al., 2019). Furthermore, financial expertise also helps them in allocating resources for environmental initiatives that align the environmental and financial goals of an organization (Sumarta et al., 2021).

Secondly, the social performance which contends to cover business impact towards society,

its stakeholder and upon itself. This is a contingent concept in the wider span of sustainable business performance which covers environmental as well as social performance. Keeping in view the growing regulatory requirements and consumer needs, business must invest in welfare of the society (Agyabeng-Mensah, Afum, & Ahenkorah, 2020). Social performance is linked with the organization reputation and its associated financial risks and opportunities (Lagasio & Cucari, 2019) Despite this some researchers have raised concern regarding associated cost and allocation of resources for social and environmental initiatives (e.g. Aguilera et al., 2007; Margolis and Walsh, 2001; Sen and Bhattachary, 2001; Waddock and Graves, 1997) they questioned whether it is financially advantageous for an organization to participate in achieving social and environmental performance. Therefore, studying this relationship with CEO attribute of financial expertise is required to see either financial expert CEO consider social performance a cost or opportunity.

Thirdly, the environmental and social performance needs to be explored in single setting because some organizations use donations; a proxy of social performance, as a fire-suppressing approach to avoid the cost of resource allocation required to address environmental issues. Wu, Jin, Monfort, and Hua (2021) ascertain that the detrimental impact on a firm's reputation resulting from breaches of environmental or occupational safety and health rules may be mitigated by philanthropic contributions. Numerous environmentally detrimental corporations in the mining, petroleum, and tobacco sectors often feature on lists of the most charitable enterprises (Du, Chang, Zeng, Du, & Pei, 2016). Research indicates that environmentally negligent companies face increased non-systemic stock risk (Bansal & Clelland, 2004; Klassen & McLaughlin, 1996). When CEO having financial expertise, they can manage recourses more effectively and allocate recourses to manage regulatory and financial pressures more effectively, resultantly impact social and environmental performance.

Overall, the financial expertise of CEOs are believed to have a positive influence on environmental as well as social performance therefore we hypothesize that:

Hypothesis 1a: *CEO financial expertise has a positive relationship with environmental performance.*

Hypothesis 1b: *CEO financial expertise has a positive relationship with social performance*

CEO Financial Expertise and Environmental Management Practices

Senior executives in companies are dedicated to implementing policies and processes that use the

company's resources to accomplish strategic objectives (Endo, 2020). As a result, this leads to both financial and non-financial benefits (Shahab et al., 2020), as well as enhancing the firms' legitimacy in the environmental context (Alrazi et al., 2015). This can be achieved by adhering to effective environmental legislation and policies. Multiple research studies have demonstrated that merely having environmental management policies and practices in place is insufficient for enhancing a company's performance. The active involvement of senior management, particularly the CEO, is crucial for implementing and enforcing these policies and practices (Galbreath, 2017; García Martín & Herrero, 2020).

This viewpoint contends that the top executive's psychological traits (such as cognitive-oriented values) and observable trait like financial expertise is important in determining how effectively a company allocates resources to implement sustainable/environmental regulations and practices to achieve competitive advantage through environmental performance and social performance (Kilincarslan et al., 2020; Nguyen et al., 2021).

Therefore, we hypothesize that:

Hypothesis 2: *CEO financial expertise has a positive relationship with environmental management practices*

Environmental Management Practices; Environmental and Social Performance

The selection of environmental management practices in business is an increasing worldwide trend. These are being investigated by researchers in connection with business and environmental performance to determine the factors that motivate their adoption (Darnall et al., 2008; Agyabeng-Mensah et al., 2020). The previous literature tries to justify this using various theoretical approaches involving institutional theory and resource-based view, as the organizations are motivated to increase their efficiency and legitimacy, which can also lead to a competitive edge. It implies that by optimizing internal processes and being perceived positively by external stakeholders, organizations can outperform competitors (Aguilera et al., 2021; Elmagrhi et al., 2019) but the findings are mixed. Therefore, in this study, we considered non-financial measures like environmental and social performance. The first concept of environmental performance refers to the extent to which companies can effectively utilize both financial and non-financial resources to mitigate the negative effects of their operations on the environment. This involves taking measures to promote environmental sustainability, such as reducing air pollution, minimizing the use of harmful materials, preventing environmental accidents, and conserving energy and

resources (Agyabeng-Mensah et al., 2020).

The second aspect is social performance which is an act of improving an organization's reputation by implementing practices that protect society and promote the well-being of employees through environmental initiatives. These matters include but are not limited to wages and benefits, training and education, management quality, health and safety concerns, equal opportunities policies, child labor, freedom of association, forced labor, and human rights and services (Wood, 1991; Vallance et al., 2011). Social performance also be measured by using donation as a proxy (Brammer & Millington, 2008; Jia & Zang, 2012). Studies conducted by Wu et al. (2021) in a Chinese perspective found that certain companies have utilized social performance as a fire-suppressing approach and a proactive approach, for window-dressing environmental misconduct. Organizations used charitable donations as a relatively low-cost way to create a cost-effective strategy to establish a socially esteemed public perception or to acquire favorable public sentiment (Koehn & Ueng, 2010). This assertion has particular validity in instances where organizations encounter the potentiality of environmental scandals. This shows an inverse relationship between the environmental practices of a firm and social performance. The researcher proposed to confirm this relation in different settings to further enhance the literature.

The existing body of evidence indicates a lack of consistency in the link between corporate environmentalism and performance. Spicer (1978) established a noteworthy positive correlation between these variables. However, a strong negative association was discovered by Klassen and McLaughlin (1996). Furthermore, in a study conducted by Mahapatra (1984), it was shown that there exists a negative correlation between corporate environmental practices and performance, particularly when a larger sample size is employed than 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. So, this study proposes the hypothesis that:

Hypothesis 3a: *Environmental management practices have a positive impact on environmental performance.*

Hypothesis 3b: *Environmental management practices have a positive impact on social performance.*

The Mediating Role of Environmental Management Practices (EMPs) between CEO Financial Expertise and Social and Environmental Performance

The CEO is considered a key architect of the organization's long-term strategic planning. They have to make decisions about different strategic choices that influence organizational performance (Sheikh, 2019). This is the reason the researchers now consider the mediation path involving strategic choices a better way to elaborate the CEO attributes and firm performance relation (Herrmann & Datta, 2006; Peterson et al., 2012; Simsek, 2007). For clarity and to present a comprehensive picture of the literature the mediation path is a better way to study the association between CEO attributes and organizational performance. The sustainable performance of an organization is also influenced by the activities of the Chief Executive Officer (CEO).

These attributes can enhance executives' commitment to institutional norms, leading to improved environmental sustainability and operational results. In other words, the unique attributes of CEOs have a crucial role in determining the extent to which a corporation engages in environmental sustainability practices, performs in this area, and discloses relevant information (Shahab, et al., 2019). Studies reveal that the mere existence of environmental management policies is not a guarantee of improved firm performance. It is the active engagement and endorsement of these practices by the CEO that truly drives the transformation toward environmental sustainability (Galbreath, 2017; García Martín & Herrero, 2020). This perspective aligns with the upper echelon's theory, suggesting that observable traits of senior management, like age, tenure, and experience, are instrumental in aligning firm resources toward achieving a competitive edge through environmental performance (Kilincarslan et al., 2020; Nguyen et al., 2021). Investors and other stakeholders are increasingly scrutinizing the alignment of firm CEOs with environmental challenges. This scrutiny is often viewed as a measure of how a firm respond to risks and opportunities in the context of environmental sustainability (Oware & Awunyo-Vitor, 2021; Rao & Tilt, 2016). Within this framework, the CEO's role in leveraging EMPs to address environmental challenges is significant and cannot be understated (Hardcopf et al., 2021).

Further, research focusing on the impact of CEOs on environmental sustainability outcomes highlights their central role in interpreting environmental trends and prioritizing issues and stakeholders (Lewis et al., 2014; Walls & Berrone, 2017). Evidence suggests that CEOs significantly influence green innovation (Galbreath, 2019), environmental performance (Chen et al., 2015), environmental strategy (Dahlmann & Brammer, 2011), and environmental disclosures (Lewis et al., 2014). In terms of professional traits, CEOs' educational background, tenure, and legal expertise significantly influence their decisions regarding environmental disclosures. For

instance, CEOs with shorter tenures, who tend to be more open-minded, are more inclined to promote environmental disclosures (Dahlmann & Brammer, 2011; Shahab et al., 2019). Additionally, CEOs with financial expertise are more likely to advocate for investments in environmental initiatives and related disclosures (Shahab et al., 2020). EMPs convert the strategic choices of financially expert CEOs into concrete financial results via improved operational efficiency, resource optimization, and innovation.

Therefore, this study hypothesize that:

Hypothesis 4a: *Environmental management practices mediates the relationship between CEOs financial expertise and environmental performance*

Hypothesis 4b: *Environmental management practices mediates the relationship between CEOs financial expertise and social performance*

Methodology

Sample Selection

There are three categories of variables use in this study; CEO financial expertise data is collected from the annual audited of FTSE-100 firms, for environmental management practices this study used a 31-item scale from Refinitiv's EIKON database, social and environmental performance variables also extracted for same data base which is a leading repository of environmental and social performance variables. The study sample comprises non-financial publicly traded companies from 2013 to 2022. Financial firms are not considered in the sample study because they have distinct regulatory framework and distinct features. After the elimination of financial institutions our final sample consists of 770 firm-year observations. The sample selection brief 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

The dependent variable of the study environmental performance is measured as per latest research

trends, (Aslam et. al., 2021) using natural log of total carbon emission and for social performance we used charitable donations as proxy following the methodology of (Haque & Ntim, 2018). The mediator is measured using a more reliable measure of 31-item scale as introduced by the Trump et. al., (2015). The independent variable CEO financial expertise is a dummy variable equal to 1 if CEO has financial education or previously worked in financial institutions, commercial banks, and investment sector, among others, and 0 otherwise (Shahab et al., 2020). The social and environmental performance are continuous variable while the EMPs a 31 item scale measure ranges from 0 to 31.

The control variables of the study are firm age, leverage and cash holding which are commonly used in previous research as control variables in previous studies measuring the relationship of CEO attributes and environment related studies (Al-Najjar and Abualqumboz, 2023; Francoeur et al., 2021). Table 2 shows the measurements and nature of all the study variables used in this paper.

Table 2: Variable and Measures

Variables	Symbols	Expected Sign	Description
Dependent Variable			
Environmental Performance	EP	+/-	Carbon Emissions (Total carbon emissions (nlog) further details. (Aslam et. al., 2021; Samsul et al., 2019)
Social Performance	SP	+	Total Charitable Donations (Haque & Ntim, 2018; Orazalin, 2019)
Independent Variable			
CEO Financial Expertise	CEO_Finexp	+	1 if CEO has financial education of work experience of financial or investment sector, 0 otherwise (Shahab et al., 2020)
Mediation Variable			
Environmental Management Practices	EMPS	+	Environmental management practices is 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)
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

The studies exploring the relationship between CEO attributes and environmental variables found that there exist endogeneity and multicollinearity issues in these relationships (Al-Najjar and Abualqumboz, 2023; Aslam, Elmagrhi, Ur Rehman, and Ntim, 2021). Therefore, while testing our study hypothesis the advanced techniques like Generalized Method of Moments (GMM) are used as recommended in the literature to overcome endogeneity and multicollinearity problems. Therefore, the following models are used:

In the first step of this study, we explore the relationship between independent variable CEO financial expertise and dependent variables environmental and social performance using equation 1a and 1b.

$$EP_{i.t=}\alpha+\beta_1 CEO\_Finexp_{i,t} + \sum_{k=1}^{3} \beta_2 Controls_{i,t}+\epsilon_{i,t}\text{----equation 1a}$$

$$SP_{i.t=}\alpha+\beta_1 CEO\_Finexp_{i,t} + \sum_{k=1}^{3} \beta_2 Controls_{i,t}+\epsilon_{i,t}\text{----equation 1b}$$

In the second step this study will evaluate the relationship between independent variable and mediator so equation 2 covers the CEO financial expertise and environmental management practices relationship.

$$\sum_{i=1}^{5} EMPs_{i.t} = \alpha + \beta_1 CEO\_Finaexp_{i.t} + \sum_{k=1}^{3} \beta_2 \, Controls_{i,t} + \epsilon_{i,t} \text{----equation 2}$$

The third step of this study will evaluate the relationship between mediator environmental management practices and dependent variables environmental and social performance using equation 3a and 3b.

$$EP_{i.t=} \alpha + \sum_{i=1}^{5} \beta_2 EMPs_{i,t} + \sum_{k=1}^{3} \beta_2 \, Controls_{i,t} + \epsilon_{i,t} \text{----equation 3a}$$

$$SP_{i.t=} \alpha + \sum_{i=1}^{5} \beta_2 EMPs_{i,t} + \sum_{k=1}^{3} \beta_2 \, Controls_{i,t} + \epsilon_{i,t} \text{----equation 3b}$$

The mediation relationship of environmental management practices between CEO financial expertise and environmental and social performance is measured in fourth step using equation 4a and 4b.

$$SP_{i.t=} \alpha + \beta_1 CEO\_Finexp_{i,t} + \sum_{i=1}^{5} \beta_2 EMPs_{i,t} + \sum_{k=1}^{3} \beta_3 \, Controls_{i,t} + \epsilon_{i,t} \text{----equation 4a}$$

$$EP_{i.t=} \alpha + \beta_1 CEO\_Finexp_{i,t} + \sum_{i=1}^{5} \beta_2 EMPs_{i,t} + \sum_{k=1}^{3} \beta_3 \, Controls_{i,t} + \epsilon_{i,t} \text{----equation 4b}$$

whereas CEO financial expertise (CEO_Finexp) is independent variable of the study, environmental management practices (EMPs) mediator and environmental performance (EP) and social performance (SP) are the dependent variable of the study; αi,t is the intercept of the model; control variables are included; β1–β3 represents regression coefficients of independent variable, mediator and of control variables, furthermore 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 3. This includes the two dependent variables environmental (EP) and social performance (SP), representing non-financial performance measures. 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. The

variability level of EP is high among the sample set firms; high level is associated with the poorer environmental performance as these firms are not managing their carbon footprint. This reflects the different levels of commitment and effectiveness in addressing the impact of environmental impact. The social performance (SP) of 720 observed value has a mean of 14.52 and standard deviation of 2.50. This shows a moderate level of community care perspective exists among the sample firms. The high standard deviation value shows the variability of firms toward social performance this way some firm have SP score of 7.80 and some are contributing a lot in towards this having 21.89 value. This shows the diversity among FTSE 100 firms towards the level of their engagement towards social responsibility. In terms of control variables, the average firm age (f age) stands at 3.935, the average cash holdings (Cash) are at 12.48, 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 37665.

The CEO financial expertise (CEO_Finexp) shows a mean value of 0.57, which indicates that nearly 50% CEOs of the sample set has some sort of financial expertise and a standard deviation of 0.50. Environmental management practices (EMPs) score represents the average of the sample firm's engagement towards environmental practices. The mean EMPS score of 19.53 suggests a moderate level of commitment to environmental management across the sample firms. The standard deviation of 8.71 indicates considerable variability in environmental management practices across firms. The range from 0 to 31, captures the diversity in environmental management engagement across firms and implies that some firms prioritize environmental responsibility more strongly than others, which have implication for sustainable business performance.

Table 3: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
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
CEO_Finexp	770	0.57	0.50	0	1.00
f age	770	3.96	0.97	1	5.73
Cash	770	12.46	1.821	6.55	17.18
Lev	745	125	1,864	0.370	37,665

Correlation Matrix

Table 4a and b present the correlation among all examined variables of the study. The table 4a show the Pearsons correlation with EP. It is shown that most of the CEO financial expertise have a significant negative correlation with environmental performance (EP). This is consistent with the study hypothesis as the negative association of CEO_Finexp with EP results into lessor emissions and resultantly better environmental performance. EMPS is showing positive association with EP which needs to be further explored with advanced techniques like regression to confirm the study hypothesis. Control Variables such as f_age, Cash and Lev shows modest but significant relationships with EP, CEO_Finexp and EMPS highlighting the influence of basic firm characteristics upon relationship of executive's attributes and corporate environmental strategies and their outcome.

Table 4a: Correlation Statistics

Variables	EP	CEO_Finexp	EMPS	f_age	Cash	Lev
EP	1					
CEO_Finexp	-0.042*	1				
EMPS	0.654***	-0.067*	1			
f_age	0.252***	-0.033	0.302***	1		
Cash	0.405***	-0.100***	0.291***	0.143***	1	
Lev	-0.055	0.036	0.025	-0.021	-0.019	1

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

The Table 4b shows the Pearsons correlation of study variables with SP. There exists a positive relationship of SP with CEO financial expertise (CEO_Finexp) and this is consistent with the hypothesis of the study. This shows that the CEOs having financial expertise show more socially responsible behavior as hypothesized in the study. Moreover, EMPs have positive association with SP as hypothesized in H3 but it has negative association with CEO_Finexp other way around hypothesized in H1. Control Variables such as f_age, Cash shows modest but significant relationships with SP, CEO_Finexp and EMPs highlighting the influence of basic firm characteristics on corporate strategy and performance.

Table 4b: Correlation Statistics

Variables	SP	CEO_Finexp	EMPS	f_age	Cash	Lev
SP	1					

CEO_Finexp	0.002*	1				
EMPS	0.660***	-0.067*	1			
f_age	0.248***	-0.033	0.302***	1		
Cash	0.374***	-0.100***	0.291***	0.143***	1	
Lev	-0.025	0.036	0.025	-0.021	-0.019	1

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

Regression Results

The problem of endogeneity is a possible obstacle in examining the relationship exploring the CEO attributes especially CEO financial expertise and EMPs. Resultantly the concern about the reliability and precision of the obtained findings increases. The estimation technique of System Generalized Method of Moments (GMM) is considered as a very efficient statistical tool for resolving problems associated with endogeneity, heterogeneity and estimate related bias (Ullah, Akhtar, and Zaefarian., 2018; Ullah, Zaefarian, and Ullah, 2020). The system GMM estimation method mitigates endogeneity concerns by using internal instruments derived from the lagged values of the dependent variables (Ullah et al., 2018). Additionally, the two-step GMM model assists in reducing data loss (Ullah et al., 2018). Accordingly, in accordance with existing environmental literature (Al-Tuwaijri et al., 2004; Anton et al., 2004; Haque and Ntim, 2018), we used the dynamic two-step system GMM model to address possible endogeneity and reverse causality concerns in estimating all research models.

Hypothesis H1a and H1b explain the impact of CEO financial expertise on environmental and social performance. The results are inconformity with the hypothesis and previous researches (Shahab et al., 2019; Ghardallou, 2022) that shows that the CEO financial expertise have positive association with social and environmental performance as summarized in table 5 (SP: $\beta = 0.038$, $p < 0.1$; EP: $\beta = -0.030$, $p < 0.05$) the negative association here means the fewer carbon emissions so better environmental performance. This supports the idea that financial expertise of CEOs influences both the social and environmental performance and does not support the fire-suppressing approach (Wu et al., 2021). Study control variables significantly impact both the social and environmental like, firm age (f_age) positively and significantly impacts the non-financial measure used in this study (SP: $\beta = 0.125$, $p < 0.01$; EP: $\beta = 0.028$, $p < 0.01$). Higher cash holdings negatively affect environmental performance (EP: $\beta = -0.051$, $p < 0.01$) but positively influence social performance (SP: $\beta = 0.000$, $p < 0.01$). Leverage shows have negative impacts on social (SP:

β = -0.000, p < 0.01) and positively impacts environmental performance (EP: β = 0.000, p < 0.01).

Hypothesis 3a and b explains the relationship between environmental management practices (EMPs) and non-financial performance measure like social, and environmental performance. The results corroborate the hypothesis that EMPs exert a positive impact on social performance (SP: β = 0.026; p < 0.01) while exhibiting a negative relationship with environmental performance (EP: β = -0.001; p < 0.01) which means reduction of emissions resultantly impact environment positively. 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).

The negative co-efficient between EMPs and environmental performance relationship—signified by a reduction in carbon emissions—aligns with prior studies (Clarkson et al., 2008; Hassan & Romilly, 2018; Moussa et al., 2020). This outcome supports the core principles of resource-based-view and institutional theories, which argue that adopting environmental management practices mitigates corporate environmental hazards. These findings affirm the effectiveness of EMPs in achieving desired environmental outcomes and are consistent with previous research (Arda et al., 2019; Aslam et al., 2021; Famiyeh et al., 2018; Hartmann & Vachon, 2018; Moussa et al., 2020).

The financial expertise of CEO is a crucial factor that plays a significant positive role in adoption of environmental management practices for any organization as hypothesized under H2 (EMPS: β = 0.210; p<0.1) and EMPs also mediate the relationship between CEO financial expertise (CEO_Finexp) and environmental and social performance.

Mediating Role of EMPS between CEO Financial expertise and Social and Environmental Performance

Table 5: GMM Regression Results -2 STEP

Variables	EMPS	SP	SP	SP	EP	EP	EP
Lag of DV	0.999***	0.789***	0.850***	0.754***	0.982***	0.992***	0.977***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)	(0.000)
CEO_Finexp	0.210*	0.038*		0.068**	-0.030**		-0.012**
	(0.111)	(0.050)		(0.031)	(0.014)		(0.005)
EMPS			0.026***	0.022***		-0.001***	-0.001***
			(0.001)	(0.001)		(0.000)	(0.000)
f_age	-0.698***	0.125***	0.032***	0.093***	0.028***	-0.007***	-0.000
	(0.013)	(0.006)	(0.001)	(0.004)	(0.003)	(0.002)	(0.001)
Cash	0.000***	0.000***	0.000***	0.000***	-0.051***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lev	0.003***	-0.000***	-0.000***	0.000	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	2.930***	2.535***	1.531***	2.718***	0.761***	0.120***	0.239***
	(0.058)	(0.063)	(0.065)	(0.073)	(0.022)	(0.021)	(0.006)
Observations	669	629	629	629	669	669	669
Number of panelcode	77	72	72	72	77	77	77
AR(2): p-value	0.0645	0.516	0.533	0.531	0.246	0.235	0.238
Hansenâ€™s J: p-value	0.264	0.304	0.423	0.199	0.477	0.153	0.384

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1; Year Effects: Yes

The path analysis results reported in table 5 support the hypothesis H4a and b that the CEOs having the financial expertise can allocate resources effectively that enhance EMPs effectiveness and results into the social performance (SP: $\beta = 0.068$; $p<0.01$). This study reports partial mediation, and results are found consistent with the hypothesis H4b. Similarly, the mediation of EMPs as hypothesized in H4a is also significantly and positively influences the relationship of CEO_Finexp and environmental performance (EP: $\beta = -0.012$; $p<0.01$). The negative co-efficient here means the reduction of carbon emission which means better financial performance.

Table 6: Sobel Test

Variables	EMPS		
	t statistics	**Standard Error**	**P-value**
Social Performance			
CEO Financial Expertise	-0.288	0.125	0.022
Environmental Performance			
CEO Financial Expertise	-0.248	0.134	0.064

Robustness Check

Robustness of the mediation is confirmed using Sobel test which was proposed by Baron and Kenny (1986) and is used in literature to confirm the mediation relationship (Aslam et al., 2021; Ali et al., 2021). Table 6 reflects the output of Sobel test and it confirms that the mediation of EMPs between CEO_Finexp and non-financial measure of social and environmental performance. The significant p-value reconfirms our mediation hypothesis H4a and H4b.

In order to confirm further the results of this study with the alternative measure of social and environmental performance as used by Orazalin, (2019) and Aslam at al., (2021) respectively. The social and environmental scores extracted from Refinitiv's EIKON database used as alternative measures. The results of robustness check are reported in table 4.7 and these are consistent with hypothesis H1 to H4 of this study and those results which were reported in table 7 of this study.

Mediating Role of EMPS between CEO Financial expertise and Social and Environmental Performance (Robustness)

Table 7: GMM Regression Results -2STEP

Variables	EMPS	S.Score	S.Score	S.Score	E.Score	E.Score	E.Score
Lag of DV	0.999***	0.828***	0.760***	0.904***	0.944***	0.679***	0.591***
	(0.001)	(0.000)	(0.000)	(0.009)	(0.011)	(0.000)	(0.012)
CEO_Finexp	0.210*	0.188*		0.058*	1.240***		1.373*
	(0.111)	(0.329)		(0.517)	(0.409)		(0.782)
EMPS			0.528***	-0.186***		0.990***	1.867***
			(0.001)	(0.011)		(0.000)	(0.018)
f_age	-0.698***	-0.809***	-1.179***	-0.788***	-1.640***	-0.642***	-2.417***
	(0.013)	(0.106)	(0.063)	(0.289)	(0.397)	(0.008)	(0.794)
Cash	0.000***	0.000***	0.000***	0.000***	0.000*	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lev	0.003***	0.004***	-0.001***	0.001***	0.027***	0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)
Constant	2.930***	14.903***	10.557***	13.607***	9.795***	4.115***	-3.886
	(0.058)	(0.322)	(0.237)	(1.282)	(1.663)	(0.222)	(2.943)
Observations	669	669	669	669	669	669	669
Number of panelcode	77	77	77	77	77	77	77
AR(2): p-value	0.0645	0.824	0.806	0.524	0.587	0.747	0.919
Hansenâ€™s J: p-value	0.264	0.319	0.303	0.209	0.131	0	0.156

Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1; Year Effects: Yes

Summary and Conclusion

This research explored the role played by the observable attribute specifically the CEO financial expertise on non-financial measures of social and environmental performance. Further, the mediating role of environmental management practices (EMPs) are studies between CEO financial expertise and social and environmental performance relationship in a single model. This study also confirmed that EMPs are associated with both social and environmental performance and in the top 100 firms of the UK the fire-suppressing approach is not observed in which charitable donations are used as a tool to create socially responsible image and avoiding resources allocation for environmental management practices. This research provides beneficial insights for literature by integrating environmental and social aspects into business strategy through bridging a gap between corporate governance, corporate environmentalism and business strategy. First, we addressed that gap highlighted by Shahab et al., (2020) by examining the role of less researched CEO attribute of financial expertise in context of its relations towards environmental and social performance. Secondly, how the CEO financial expertise behaves towards the adoption of environmental management practices which are key contributor of organizational long-term success and sustainable business performance.

Thirdly, the environmental management practices role as highlighted by Aslam et al, (2021) is studied as mediator between financial expertise and social and environmental performance. This contributes new insight into literature that the financial expertise of CEO helps them to better manage and strategize the firm resources for environmental management activities which further enhances both the social and environmental performance which are important for organizations' strategic and long-term growth. Fourthly, only non-financial performance measures are considered which results in sustainable business performance (Agyabeng-Mensah et al., 2020; Orazalin, 2019). Furthermore, the social performance measures of charitable donations are believed to be used as fire-suppressing approach to protect the organization's reputation to cover their deteriorated environmental performance (Wu, Jin, Monfort, & Hua, 2021). Studying both in single models helps them to give a more holistic view about the organization attitude towards sustainability. Fifthly the appropriate measure of environmental management practices is under continuous debate, and we used the measure proposed by Trump et al.

(2015) which covers all aspect of environmental practices (Aslam et al., 2021). Empirical analysis of this study confirms the significant positive impact of CEO financial expertise on social and environmental performance. Second, the direct impact of CEO financial expertise on adoption of EMPs is positive and these practices positively impact both the social and environmental performance. The mediation of these practices plays a positive impact both on social and environmental performance as hypothesized in this study.

The sample of this study comprises of listed non-financial firms of FTSE-100 over the period 2013-2022 and we used two step GMM regression to test the study hypothesis. Additionally, to confirm mediation we used Sobel test and alternate dependent variables measures used for robust analysis. Under H1a and H1b we enquired that CEO financial expertise positively impacts environmental and social performance. The results fully support these hypotheses and validate the prior literature (Shahab et al., 2020; Lagasio & Cucari, 2019). In addition, the we hypothesize and empirically confirmed that the environmental management practices (EMPs) plays a mediating relationship between the CEO financial expertise and social and environmental performance measure. (Kilincarslan et al., 2020; Nguyen et al., 2021). Our research findings have various theoretical implications for existing literature as this enriches the CEO attributes and corporate environmentalism and business strategy literature due to the influential role played by these attributes like financial expertise in environmental and social performance directly and through adoption of environmental management practices (EMPs). This supports the Upper Echelon perspective that the attributes of CEOs shape the organization's success by influencing the selection of environmental management practices.

This research has many policy implications, including the enhancement of governance and the promotion of sustainable business practices. Governments and regulatory organizations may provide incentives for corporations that adopt effective environmental management practices and require thorough reporting on environmental and social performance. This enhances openness, accountability, and motivates companies to implement sustainable measures. This research advocates for the formulation of cohesive strategic plans that synchronize financial, environmental, and social objectives from a corporate strategy and risk management standpoint. It underscores the need for risk assessment frameworks to mitigate environmental and social concerns, hence assuring

robust corporate practices. Moreover, stakeholder engagement rules have to foster inclusive decision-making processes and facilitate transparent communication methods that emphasize the influence of CEO financial acumen and EMPs. These policy implications jointly improve the performance and sustainability of organizations, fostering good developments in corporate governance, environmentalism, and business strategy. Like previous investigations, this study has certain limitations that can be addressed by future research efforts. Initially, we concentrated only on the non-financial firms in our sample building. We advocate for more research to duplicate this methodology within the context of financial institutions. Secondly, unlike established markets, developing countries have a more pronounced concentration of ownership, including familial and governmental ownership. Future research may expand this field by analyzing the personality traits of CEOs and their influence on corporate performance, especially regarding family and state ownership. Ultimately, further research might be undertaken to analyze the interaction effects among various personality qualities. CEOs of different age with CEO duality may demonstrate distinct behaviors about corporate disclosures.

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