

Exploring corporate environmental ethics and green creativity as antecedents of green competitive advantage, sustainable production and financial performance: empirical evidence from manufacturing firms

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Abstract

Purpose – Environmental degradation in emerging economies has induced stakeholder pressures on diverse firms to ensure sustainable business performance. Consequently, firms are adopting environmentally ethical cultures and reinforcing green creativity to satisfy stakeholders' environmental needs while attaining green competitive advantage, sustainable production and higher financial performance. The purpose of this study is to investigate whether corporate environmental ethics and green creativity serve as antecedents to higher competitiveness, sustainable production and financial performance, and also examine if green competitive advantage and sustainable production mediate the relationships between corporate environmental ethics, green creativity and financial performance in the context of an emerging economy.

Design/methodology/approach – This study using a survey approach examined data from 290 manufacturing small and medium-sized enterprises. Data were analyzed and interpreted using SmartPLS 3.0 software, a variance-based structural equation modelling technique. This modelling technique was adopted due to its suitability for predictive research models.

Findings – The findings show that corporate environmental ethics and green creativity are critical antecedents to green competitive advantage, sustainable production and financial performance. The results connote that while corporate environmental ethics and green creativity directly and robustly influence green competitive advantage, sustainable production and financial performance, their effect on financial performance is strengthened via the indirect effects of green competitive advantage and sustainable production. Contrasting past findings, corporate environmental ethics negatively related to financial performance in this study context. The findings indicate that the integration of environmental ethics and green creativity can be a unique strategy for mitigating environmental negative risks while improving green competitive advantage, sustainable production and financial performance.

Originality/value – The study is among the few that draws insights from organizational ethics and the natural resource-based view (NRBV) to examine the interactions between corporate environmental ethics, green creativity, green competitive advantage, sustainable production and financial performance. Drawing insights from the findings, the study provides suggestions for managers, academicians, policymakers and governments as well as highlights implications and directions for future research.

Keywords Corporate environmental ethics, Green creativity, Green competitive advantage, Sustainable production, Financial performance, PLS-SEM

Paper type Research paper



1. Introduction

Amid growing environmental degradation issues caused by rising industrialization in emerging economies, multifarious stakeholders have mounted significant pressures on manufacturing firms to ensure environmental preservation (Steffen *et al.*, 2015; Han *et al.*, 2019; Baah *et al.*, 2020, 2021a; Afum *et al.*, 2020). Menguc *et al.* (2010) assert that firms via the adoption of corporate environmental ethics can attain legitimacy with diverse stakeholder groups while preserving the environment and promoting societal development. Agyabeng-Mensah *et al.* (2021) posit the importance of environmental cultures for manufacturing sectors due to their enormous contribution to environmental pollution and degradation. While in developed economies, most small and large manufacturing firms have adopted sustainable strategies that encourage circular economy initiatives, most manufacturing firms in developing countries are still in the industrialization phase characterized by environmental pollution, heavy reliance on natural resources, robust energy consumption, among others, thus making environmental dilapidation in emerging economies one of the potent challenges for attaining global sustainable development in the foreseeable future (Xie *et al.*, 2019).

Governments perceiving the seriousness of environmental concerns in emerging economies have intensified regulations to further coerce manufacturing firms to implement strategies that ensure sustainable business operations (Afum *et al.*, 2022; Fernando *et al.*, 2019). To achieve sustainability outcomes in manufacturing sectors, some scholars have highlighted the need for antecedents that serve as crucial measures in helping generate green initiatives that ensure significant sustainable operations (Aslam *et al.*, 2020; Han *et al.*, 2019). While recent literature on corporate environmental ethics reveals organizational ethical cultures as valuable resources, Chen and Chang (2013) further suggests that they enable green creativity within the firm, resulting in green competitiveness. As supported by the natural resource-based view (NRBV), organizations that are embedded in corporate environmental ethical cultures implement proactive environmental practices (Hart, 1995; Han *et al.*, 2019). Particularly, the NRBV highlights that integrating corporate environmental ethics via implementation of environmental policies, training and pro-environmental practices boosts green creativity and helps minimize negative environmental impacts through sustainable production and also achieves green competitive advantage (Hart, 1995; Adomako *et al.*, 2021; Baah *et al.*, 2021b, c).

While the traditional economic theory suggests that environmental management investments significantly increase operational and transactional costs resulting in negative impacts on financial and economic performances (Guo *et al.*, 2020), Chen and Chang (2013) categorized corporate environmental ethics and green creativity as intangible assets, that have the ability to align the skills, motives, and attitudes of a workforce to a firm's environmental systems, processes and practices leading to innovation and competitiveness. Yazdani and Murad (2015) draw insights from the ethical theory of organizing to posit that firms by being ethical develop trust as a competency and capability. Trust as an intangible capability and competency, according to Chang (2011), is a rare, inimitable, valuable and non-substitutable resource that drives legitimacy, competitiveness, creativity and innovation. Therefore, integrating organizational ethics and NRBV provides a better theoretical lens in investigating how corporate environmental ethics and green creativity serve as antecedents of green competitive advantage, sustainable production and financial performance.

Additionally, corporate environmental ethics and green creativity have emerged as potential mechanisms through which manufacturing firms optimize their green strategies, innovation and resources for obtaining greater operational efficiency and financial performance (Wang and Sarkis, 2017; Tang *et al.*, 2020). Thus, corporate environmental ethics and green creativity are lately gaining attention as new means to strengthening corporate reputation, credit accessibility, moral and social capitals (Wang *et al.*, 2017; Baah *et al.*, 2021b, c; Agyabeng Mensah *et al.*, 2021). Specifically, Chang (2011) highlighted that firms use corporate environmental ethics and green

creativity to attract more environmentally conscious investors which means more credit facilities to increase working capital. In addition, having an environmentally ethical culture and possessing a green creative employee base deepens green product and process innovations, proactive response to environmental concerns and green competitiveness (Jabbour *et al.*, 2020; Han *et al.*, 2019).

Similarly, Guo *et al.* (2020) suggest that firms that have environmentally ethical cultures better promote stakeholder ties and economic performance than firms that do not. Rui and Lu (2021) also suggest that the benefits of corporate environmental ethics and green creativity include the attraction of external stakeholder support and resources. Despite the benefits, little is known about how corporate environmental ethics and green creativity influence green competitive advantage, sustainable production and financial performance of manufacturing firms operating in an emerging economy. Thus, this study aims to investigate if corporate environmental ethics and green creativity drive sustainable production practices, competitiveness and financial performance since past studies, in emerging economies, provide little on the associations between the adopted variables. Furthermore, by investigating the associations between the variables, the study provides empirical evidence concerning the mechanisms through which manufacturing firms can achieve superior sustainability outcomes given that sustainable production, green competitiveness and financial performance are relevant indicators of a firm's sustainability (Zameer *et al.*, 2020; Huo *et al.*, 2019).

Besides, this study is also empirically among the first few to establish direct and indirect relationships among corporate environmental ethics, green creativity, sustainable production, green competitiveness and financial performance, especially in the context of an emerging economy seeing that significant studies have been conducted in developed countries. The rest of the paper is organized as follows. Section 2 of the study exposes the theoretical framework and hypothesis development, while Sections 3 and 4 reveal research methods and results. Section 5 captures the discussion highlighting theoretical and managerial implications, and section 6 presents the conclusion in addition to research limitations and future research direction.

2. Theoretical framework and hypothesis development

2.1 Ethical theory of organizing and NRBV perspectives

Yazdani and Murad (2015) elucidate that economically driven organizational cultures have resulted in diverse corporate scandals such as Enron and WorldCom, among others, because economically motivated firms predominantly detached themselves from social and environmental initiatives in pursuit of shareholder gains. Chang (2011) posits that firms that lack environmental and societal objectives or ignore such initiatives will fail to amass stakeholder trust and legitimacy. Thus, the author recommends firms aim beyond profit maximization to achieve social and ecological objectives. According to Yazdani and Murad (2015), it is crucial to cultivate an ethical culture within a company by identifying the antecedents, organizational practices and results where profitability is a secondary outcome under the supremacy of ethics to foster greater firm performance. Primarily, the authors, using the ethical theory of organizing, posit that ethical cultures build trust which becomes a critical competency and capability for attaining sustained competitive advantage. Colquitt and Rodell (2011) supporting the above also indicate that trust is essential in completing tasks or responsibilities in an organization successfully. From an environmental perspective, Han *et al.* (2019) elaborate that ethical cultures shape the primary beliefs and values that promote environmental or green behaviors in a firm. Xu *et al.* (2018) also indicate that a firm's environmental culture or behavior due to the trust it builds with stakeholders is a potent indicator of sustainable collaborations, competitiveness and performance.

Building on the ethical theory of organizing, Pirson and Maholtra (2011) further posit that ethics-based trust is positively correlated with green innovation and creativity, knowledge

acquisition and transfer, collaboration capability and a firm's competitive advantage. Positioning environmental ethics as a resource, [Chang \(2011\)](#) argues that having an ethical culture can become a capability that is valuable, rare, inimitable and non-substitutable. Additionally, [Han et al. \(2019\)](#) explain from the NRBV perspective that creating environmentally ethical cultures not only pushes green creativity but also enables proactive responses to environmental concerns and minimizes negative environmental impacts ([Hart, 1995](#); [Han et al., 2019](#)). [Fernando et al. \(2019\)](#) imply that achieving green competitive advantage, sustainable production and financial performance is centered on how an organization is able to leverage its environmentally ethical culture, green creativity and green innovation. Essentially, corporate environmental ethics and green creativity, which capture the skills, motives, attitudes and knowledge of managers and employees, facilitate the generation of original, novel and useful product and process ideas that push sustainable production, green competitiveness and financial performance. According to [Chang \(2011\)](#) and [Chen and Chang \(2013\)](#), while corporate environmental ethics reflects the total ethical belief, value and norm of environmental concerns within a firm, green creativity reveals the creation of original, novel and useful ideas that aim at promoting ecological balance and green innovativeness.

Drawing insights from the ethical theory of organizing and NRBV, the study asserts that firm environmental ethics and green creativity not only potentially increase sustainable production and green competitive advantage but also ensure financial dominance through the continuous accumulation of benefits derived from mitigating negative ecological risks, attaining corporate legitimacy, reputation and attracting green investors ([Guo et al., 2020](#); [Chang, 2011](#); [Bi et al., 2021](#)). [Table 1](#) presents the operational definitions of the adopted study variables.

2.2 Corporate environmental ethics, green competitive advantage, sustainable production and financial performance

Environmentally ethical cultures have been considered as crucial internal resources that create and enable businesses to employ creativity and innovative strategies that enhance green competitiveness ([Singh et al., 2019](#); [Guo et al., 2020](#)). While [Bag et al. \(2022\)](#) posit that excessive

Research construct	Operational definition	References
Corporate environmental ethics	The total ethical belief, value and norm of responding to environmental concerns within a firm	Chang (2011) , Han et al. (2019)
Green creativity	Underlies the development of new ideas about green products, green services, green processes or green practices that are judged to be original, novel, and useful	Chen and Chang (2013) , Guo et al. (2020) , Singh et al. (2019)
Sustainable production	The creation of goods and services using systems and processes that are deemed as environmentally friendly, non-polluting, conserves resources and energy	Alayón et al. (2017) , Baah et al. (2021b, c) , Wang et al. (2019)
Green competitive advantage	The ability to gain benefits from environmental management and green innovation strategies and as such, occupy a position where competitors cannot copy such environmental strategies	Chen and Chang (2013) , Agyabeng-Mensah et al. (2021) , Zameer et al. (2020)
Financial performance	The assessment of fiscal health by considering assets, equity, revenues and overall profitability of a firm	Wang and Sarkis (2017) , Dong et al. (2020) , Awaysheh et al. (2020)
Source(s): Authors' own work		

Table 1.
Operational definition
of constructs

ethical training and audits have negative impacts on a firm's relationship quality and trust, [Han et al. \(2019\)](#) assert that firms that are embedded in sound environmental ethical cultures have strong commitments to ensuring checks on adverse environmental impacts, ultimately promoting stakeholder trust and relationships. Adding to this, [Chang \(2011\)](#) posited that corporate environmental ethics aid the implementation of policies that enhance an organization's green production practices and processes. In fact, firms through corporate environmental ethics gain the natural tendencies to proactively respond to environmental concerns while also enabling innovativeness. This innovation allows firms the ability to outperform competitors establishing a green competitive advantage ([Chen et al., 2009](#); [Barney, 2001](#)). [Chen et al. \(2016\)](#) further posited that green creativity which is attained through ethical cultures drives sustainable production. This assertion was supported by [Guo et al. \(2020\)](#) when they asserted that corporate environmental ethics promote green creativity which also creates environmental value through the development of ecologically friendly products, raw material conservation, pollution reduction, enhancement in energy conservation and efficiency.

[Cerchione and Bansal \(2020\)](#) from an Indian context specified that businesses that generate and sustain ecological cultures can acquire stakeholder support and resources that aid the implementation of environmental policies. Furthermore, past studies ([Jabbour et al., 2020](#); [Cerchione and Bansal, 2020](#); [Chen and Chang, 2013](#)) highlight that the ability to achieve sustainable production, green competitiveness in addition to the implementation of corporate environmental ethics enhances legitimacy with stakeholders, the attraction of green credit and investors, increase sales and larger market share, which eventually results in higher financial performance. Essentially, environmentally conscious firms not only adhere to strict sustainable production requirements such as ISO 14001 and emission cut-offs, but also proactively engage environmental stakeholders, hence strengthening relationships and reputation with key industry players and stakeholders, as such accruing sustainable benefits that directly influence and links to sustainable business performance. From the discussion, we hypothesize that:

- H1. Corporate environmental ethics positively influences green competitive advantage.
- H2. Corporate environmental ethics positively influences financial performance.
- H3. Corporate environmental ethics positively influences sustainable production.

2.3 Green creativity, green competitive advantage, sustainable production and financial performance

Green creativity is regarded as one kind of necessity to attain sustainable business performance ([Chen et al., 2016](#)). This is because green creativity stimulates novel thinking in green product development, sustainable production and proactive environmental actions, eventually facilitating green innovations ([Chen et al., 2016](#); [Chang, 2011](#); [Guo et al., 2020](#)). While [Przychodzen et al. \(2016\)](#) acknowledge that creative thinking underlines the recognition and conversion of ideas into new products and services, [Agyabeng-Mensah et al. \(2023\)](#) elucidate that creative thinking is grounded on a firm's knowledge about its environment and stakeholders. From the green perspective, creativity that centers on the environmental demands of stakeholders lead to the development of novel ideas regarding green products, green services, green processes or green practices ([Chen and Chang, 2013](#)). In addition to environmental ethics, green creativity is considered fundamental to green practices and environmental management systems ([Chen et al., 2016](#)). [Jia et al. \(2018\)](#) indicated that green creativity serves as a crucial determinant in adopting sustainable production practices and processes, which further improve performance and competitive advantage. While [Dangelico et al. \(2017\)](#) posited that green creativity motivates sustainable production that uniquely positions the firm among its competitors, [Singh et al. \(2019\)](#) also advocate that

green creativity is a function of corporate environmental ethics and sustainable management. As such, green creativity promotes and breeds innovativeness leading to green production and achievement of green competitive urge over competitors ultimately improving financial performance. In addition, some academics (Chen *et al.*, 2009; Guo *et al.*, 2020; Chen and Chang, 2013) assert that organizations focused on green creativity and innovation should expect to gain greater environmental benefits, support from a variety of stakeholders, attract green credit and draw investors, all of which will ultimately help achieve sustainable business performance. Consequently, this study proposes that:

H4. Green creativity positively influences green competitive advantage.

H5. Green creativity positively influences financial performance.

H6. Green creativity positively influences sustainable production.

2.4 Mediating impacts of green competitive advantage and sustainable production

As firms aim to achieve superior financial performance, the need to respond to market demands which include adhering to environmental regulations as well as responding to environmental concerns cannot be downplayed (Singh *et al.*, 2019; Aftab *et al.*, 2022). Aftab *et al.* (2022) explain that companies, through green innovation and creativity, must continually aim to attract and satisfy multifarious environmentally conscious stakeholders to maintain market competitiveness and higher performance. In particular, firms must update their green innovation capabilities to adjust to changing market and stakeholder needs (Baah *et al.*, 2023). Possessing a green competitive advantage and engaging in sustainable production not only imply the effective and efficient acquisition and combination of resources but also a proactive response to stakeholder demands, which leads to increased financial performance (Afum *et al.*, 2020; Agyabeng-Mensah *et al.*, 2021). Additionally, stakeholder engagement has been also associated with knowledge sharing and higher consumer satisfaction (Agyabeng-Mensah *et al.*, 2023). The interplay between stakeholders and the unique combination of resources enhances a firm's fiscal health (Papadas *et al.*, 2019). While green competitive advantage and sustainable production improve financial performance through economies of scale, lower production costs, the attraction of green credit and investors, waste minimization, resource conservation, among others (Hahn and Figge, 2011; Cerchione and Bansal, 2020; Jabbour *et al.*, 2020), it also indirectly strengthens the relationships between corporate environmental ethics, green creativity and financial performance.

Gligor *et al.* (2019) posited that the benefits associated with sustainability have in one way or the other motivated its adoption in several industries in addition to stakeholder pressures. The NRBV suggests that having environmentally ethical cultures allows the sustainable integration of resources in production that strengthens value creation and green competitive advantage. This sustainable production and green competitive advantage, according to Jabbour *et al.* (2020), have significantly elevated business performance and as such, have become fundamental reasons for orientation toward corporate environmental ethics and green creativity. Additionally, Singh *et al.* (2019) and Chen and Chang (2013) claim that these influence firm green capabilities thus should be considered as strategic resources that possibly improve the adopted dimensions of sustainable business performances. Therefore, corporate environmental ethics and green creativity will lead to increased or superior financial performance through the indirect influences of sustainable production and green competitive advantage, as graphically presented in Figure 1. Thus, we hypothesize that:

H7. Green competitive advantage positively influences financial performance.

H8. Sustainable production positively influences financial performance.

- H9. Green competitive advantage indirectly influences the relationships between corporate environmental ethics (a) green creativity (b) and financial performance.
- H10. Sustainable production indirectly influences the relationships between corporate environmental ethics (a) green creativity (b) and financial performance.

3. Research methods

3.1 Sample, data collection and common method bias (CMB)

This study, relying on the review of extant literature, developed questionnaires based on the theoretical and conceptual framework of the study as indicated in Section 2. The questionnaires were developed to solicit primary data on a sample of four hundred and eighty small and medium-sized enterprises (SMEs), which were randomly chosen from a list of about three thousand and eight SMEs obtained from the Association of Ghana Industries using a purposive sampling technique (Agyabeng-Mensah *et al.*, 2020). The questionnaires and a cover letter clarifying the objectives of the study were sent to selected firms, and follow-up phone calls were placed to show gratitude and serve as reminders for non-respondents after a week to two weeks interval. From the 480 questionnaires distributed among SMEs mostly manufacturing firms, 320 questionnaires were retrieved giving a response rate of about 65%. An inspection of the returned questionnaires showed 30 had missing entries and thus were removed from the data analysis.

The inconclusiveness of the excluded questionnaires in addition to some highlighted shortfalls of the survey method of data collection as captured by past studies (Podsakoff *et al.*, 2003) motivated the need to test common method bias (CMB) using Harman's one factor test. Thus, following the guidelines of Podsakoff *et al.* (2003), Harman's one factor test was employed,

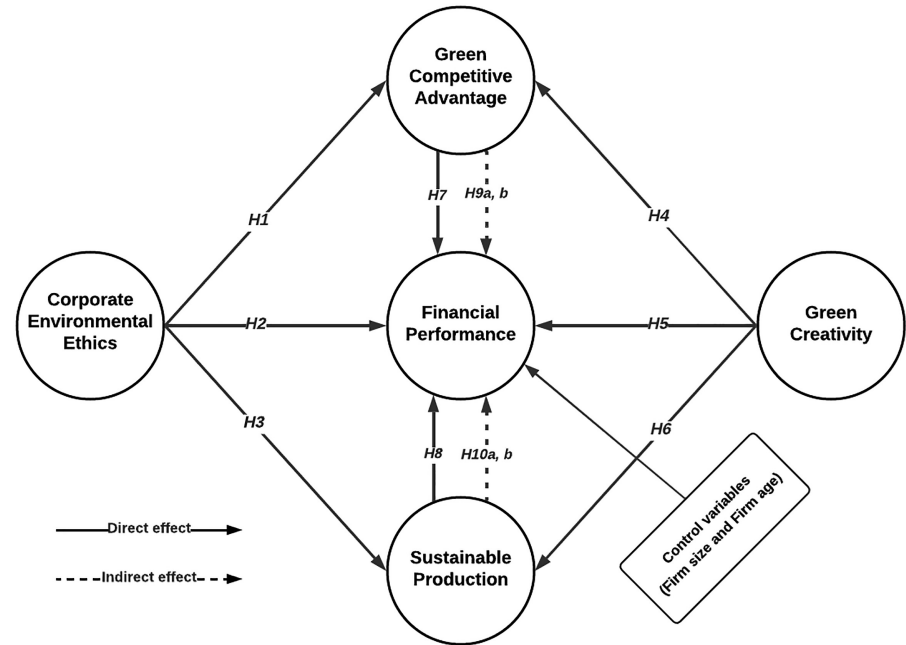


Figure 1.
Conceptual model

Source(s): Authors' own work

and the results from the exploratory factor analysis showed that the single factor explained 36.815% of the cumulative variance. This result being below the recommended threshold of 50% shows the study is free from issues of CMB. Specifically, the questionnaires were structured in line with the recommendations of Podsakoff *et al.* (2003) in order to resolve or reduce issues of CMB. As such, the questionnaires presented well-structured separation of measured items, promised anonymity to respondents and attained measures from different sources. Additionally, the study employed Kaiser–Meyer–Olkin measure of sampling adequacy (KMO) and Bartlett's test of sphericity in determining the data are sufficient for factor analysis and comparing the observed correlation matrix to the identity matrix respectively. The results showed that the KMO measure of sampling adequacy was 0.801 and acceptable. The Bartlett's test showed a significance value of 0.000 which is below the threshold of 0.005. Hence, these conclusions show the adequacy of the sample for factor analysis as well as no issues of high correlation. Table 2 reveals the profile of respondent SMEs.

Firm characteristics	Frequency (%)
<i>Gender</i>	
Male	194 (67%)
Female	96 (33%)
<i>Number of employees</i>	
<10	40 (14%)
11–50	38 (13%)
51–100	40 (14%)
101–500	60 (21%)
501–1,000	47 (16%)
>1,000	65 (22%)
<i>Firm age</i>	
<5 years	50 (17%)
5–10 years	76 (26%)
10–15 years	80 (28%)
15–20 years	45 (16%)
>20 years	39 (13%)
<i>Work experience (years)</i>	
1–5	66 (23%)
6–10	70 (24%)
11–15	55 (19%)
15–20	65 (22%)
Over 20	34 (12%)
<i>Industry</i>	
Wood, lumber products and processing	57 (20%)
Rubber and other plastic products	78 (27%)
Food and beverages	50 (17%)
Leather products and processing	55 (19%)
Textile and fabric products	30 (10%)
Others	20 (7%)
<i>Job qualification</i>	
Owner	85 (29%)
Manager	98 (34%)
Assistant manager	52 (18%)
Departmental heads/supervisors	55 (19%)
Source(s): Authors' own work	

Table 2.
Characteristics of
respondents (*n* = 290)

3.2 Measurement model assessment

Before sending out the questionnaires, eight experts were invited to assess the measuring items and content of the questionnaire. These experts initially indicated that the content and questions measured their constructs and therefore deemed the questionnaire adequate for its purpose with minor changes, which were mostly related to rewording and rephrasing of some of the contents. These invited experts consisted of four professionals from industry (manufacturing sector) and four from academia. The study adopted a 5-point Likert scale, where 1 represented strongly disagree to 5 strongly agree, to measure the extent to which respondents agreed or disagreed to each item as is the case in their respective firms. The study adopted a 5-point Likert scale based on the recommendation of [Sachdev and Verma \(2004\)](#) that it reduces respondents' frustration level and increases response rate and quality.

Furthermore, we examined each measurement item during confirmatory factor analysis (CFA) to ensure the model has validity and reliability. According to [Hair et al. \(2013\)](#), factor loadings above 0.70 should be maintained, and those below 0.70 should be deleted. The authors indicated that deleting lower-loading items strengthens the model path, average variance extracted (AVE), R Squared (R^2), and predictive relevance (Q^2). Based on this recommendation, most measurement items that loaded below 0.70 were deleted from the model except a few items (GC5, GCA5, SP2, SP5, FP3 and FP4) that contributed to predictive relevance during CFA. The study employed partial least square-structural equation modelling (PLS-SEM) (SmartPLS software 3.0) in making data analysis and interpretation.

According to [Henseler et al. \(2015\)](#), a model's reliability and validity which is assessed using Cronbach's alpha (CA), composite reliability (CR), AVE and Heterotrait-Monotrait (HTMT) ratio should have ≥ 0.70 , ≥ 0.70 , ≥ 0.60 and < 0.90 , respectively, in order to be considered satisfactory. From [Table 3](#), the model constructs have internal consistency reliability because the CR and CA were within the range of 0.845–0.881 and 0.776 to 0.823. The AVEs, which assess that indicators measured one underlying construct, were with a recommended range of 0.523–0.650. As posited by [Henseler et al. \(2015\)](#), the outer VIFs show the study is free from multicollinearity issues since all values were < 3 .

Furthermore, discriminant validity was examined using HTMT ratio which is the current and presents a more sophisticated examination of discriminant validity. From [Table 4](#), the model achieves discriminant validity since all ratios were < 0.90 . The correlations among the variables have also been captured in [Table 3](#).

4. Results

4.1 Structural model evaluation

Next to confirming the model achieves reliability, convergent and discriminant validity, we assess the structural model and test hypotheses by scrutinizing the R^2 and Q^2 . Also, path coefficients (β) and significance levels (p -values) are observed as suggested by [Hair et al. \(2013\)](#). [Hair et al. \(2013\)](#) suggest that reporting the R^2 and Q^2 in PLS-SEM is necessary in empirical exploratory studies. The Stone–Geisser's Q^2 explains a model has predictive relevance when Q^2 values are > 0 . From [Table 5](#), the blindfolding procedure confirmed that the constructs have predictive relevance since Q^2 values are > 0 .

4.2 Hypothesis testing

After evaluating the measurement and structural models, we further tested the hypothesized relationships in the study and presented the findings in [Table 6](#). The results show that although corporate environmental ethics positively and significantly influenced green

						Corporate environmental ethics
Measurement items	CR	CA	AVE	Factor loading	Outer VIF	
Corporate environmental ethics (CEE)	0.881	0.823	0.650	–	–	
1. Our firm has clear and specific environmental policies				0.762	1.419	
2. Our firm frequently invests in environmental protection				0.775	1.472	
3. Our firm integrates environmental concerns and initiatives to its culture				0.789	2.002	
4. Our firm integrates environmental goals and strategies into marketing campaigns				0.893	2.211	
<i>Source: Guo et al. (2020), Singh et al. (2019), Han et al. (2019)</i>						
Green creativity (GC)	0.863	0.819	0.559	–	–	
1. Our firm proposes new green ideas to promote environmental performance				0.718	2.140	
2. Our firm frequently suggests new avenues to achieve environmental goals and targets				0.769	2.574	
3. Our firm ensures the generation of novel ways to implement green ideas				0.778	2.384	
4. Our firm is constantly proposing creative solutions to environmental issues/problems				0.793	1.993	
5. Our firm frequently promote the rethinking of already implemented and new green ideas				0.673	1.122	
<i>Source: Barczak et al. (2010), Chen and Chang (2013), Song and Yu, 2018</i>						
Green competitive advantage (GCA)	0.845	0.776	0.523	–	–	
1. Our green products and services are better than those of competitors				0.719	1.873	
2. Our green competitive advantage is better than competitors				0.794	1.656	
3. Our business green processes is better than competitors				0.729	1.987	
4. Our managerial and employee capabilities are better than competitors				0.730	1.501	
5. Our green strategies and reputation are better and stronger than competitors				0.635	1.340	
<i>Source: Singh et al. (2019), Agyabeng-Mensah et al. (2020), Guo et al. (2020)</i>						
Sustainable production (SP)	0.854	0.791	0.540	–	–	
1. Our production practices and processes reduce negative environmental impacts				0.719	1.781	
2. Our production conserves energy and materials				0.690	1.522	
3. Our production practices and processes ensure minimum chemical, ergonomic and physical hazards				0.801	2.000	
4. Our production practices and processes ensure that products/services/packages are safe and ecologically balanced				0.772	1.699	
5. Our firm ensures waste minimization during production				0.686	1.215	
<i>Source: Veleva et al. (2001), Alayón et al., 2017</i>						
Financial performance (FP)	0.861	0.797	0.555	–	–	
1. Our business has a large market share				0.719	1.656	
2. Our firm accrues high returns on investment				0.809	1.768	
3. Our company has high growth of market share				0.680	1.432	
4. Our business has high profit margin on sales				0.650	1.837	
5. Our firm has high returns on equity				0.844	2.372	
<i>Source: Alayón et al. (2017), Jabbour et al. (2020), Baah et al. (2021b, c)</i>						
Note(s): *CA – Cronbach's alpha; CR – composite reliability; AVE – average variance extracted; VIF – variance						
Source(s): Authors' own work						

Table 3.
Measurement items,
reliability and validity

competitive advantage ($\beta = 0.642$, $T = 18.201$, $p < 0.001$) and sustainable production ($\beta = 0.657$, $T = 18.661$, $p < 0.001$), its effect on financial performance is significant yet negative ($\beta = -0.302$, $T = 3.542$, $p < 0.001$). Thus, while H1 and H3 were supported, H2 was not supported. Green creativity is positively and significantly related to green competitive advantage ($\beta = 0.280$, $T = 5.836$, $p < 0.001$), financial performance ($\beta = 0.248$, $T = 4.535$, $p < 0.001$) and sustainable production ($\beta = 0.288$, $T = 7.362$, $p < 0.001$). Thus, H4, H5 and H6 were supported. Green competitive advantage ($\beta = 0.453$, $T = 6.748$, $p < 0.001$) and sustainable production ($\beta = 0.462$, $T = 7.182$, $p < 0.001$) also positively and significantly related to financial performance, thus supporting H7 and H8.

Following the guidelines of Hayes and Preacher (2010), we tested whether green competitive advantage and sustainable production mediate the relationship between corporate environmental ethics and financial performance using the bias-corrected bootstrapping method. The results presented in Table 6 show that the indirect effect of corporate environmental ethics on financial performance via green competitive advantage ($\beta = 0.291$, $T = 6.333$, $p < 0.001$) and sustainable production ($\beta = 0.303$, $T = 6.904$, $p < 0.001$) were significant, thereby confirming a competitive mediation and supporting H9a and H10a. Moreover, the study results show that green competitive advantage ($\beta = 0.127$, $T = 4.369$, $p < 0.001$) and sustainable production ($\beta = 0.133$, $T = 4.886$, $p < 0.001$) also had complementary mediating effects between green creativity and financial performance, thus supporting H9b and H10b. Comparing the two mediating effects from corporate environmental ethics to financial performance and from green creativity to financial performance, the former was categorized as a competitive mediation because the direct effect was negative yet significant and the indirect effect was positive and also significant. The latter was also captured as complementary mediation because both direct and indirect effects were positive and significant.

Drawing on past studies, we considered control variables in the research model. The analysis of the data indicated that firm size and firm age were insignificant at a one-tailed significance level (0.05) in influencing the constructs adopted in the study model, as presented in Table 6 and Figure 2.

Table 4.
Correlations and
HTMT ratio

Construct	1	2	3	4	5
1. Corporate environmental ethics	1.000	0.802	0.836	0.464	0.713
2. Financial performance	0.686	1.000	0.855	0.685	0.824
3. Green competitive advantage	0.684	0.795	1.000	0.586	0.870
4. Green creativity	0.524	0.660	0.529	1.000	0.544
5. Sustainable production	0.619	0.790	0.712	0.553	1.000

Note(s): *Construct correlation values are below the diagonal elements and HTMT values are above the diagonal elements
Source(s): Authors' own work

Table 5.
Structural model's R²
and Q²

Endogenous constructs	R ²	R ² adjusted	Q ²
Financial performance	0.751	0.745	0.382
Green competitive advantage	0.626	0.622	0.294
Sustainable production	0.658	0.654	0.330

Source(s): Authors' own work

Hypothesis direct effects	Coefficient (β)	T-value	P-value	Standard error	Inner VIFs	Decision
H1: CEE $\rightarrow$ GCA	0.642	16.219	0.000	0.040	1.166	Supported
H2: CEE $\rightarrow$ FP	−0.302	3.542	0.000	0.085	2.228	Not supported
H3: CEE $\rightarrow$ SP	0.657	19.520	0.000	0.034	1.166	Supported
H4: GC $\rightarrow$ GCA	0.280	5.434	0.000	0.052	1.166	Supported
H5: GC $\rightarrow$ FP	0.248	4.043	0.000	0.061	1.524	Supported
H6: GC $\rightarrow$ SP	0.288	7.145	0.000	0.040	1.166	Supported
H7: GCA $\rightarrow$ FP	0.453	6.563	0.000	0.069	2.040	Supported
H8: SP $\rightarrow$ FP	0.462	6.887	0.000	0.067	2.182	Supported
Indirect effects						
Bias-corrected confidence interval (0.05–99.5%)						
H9a: CEE $\rightarrow$ GCA $\rightarrow$ FP	0.291	6.069	0.000	0.048		0.173–0.467
H9b: GC $\rightarrow$ GCA $\rightarrow$ FP	0.127	4.111	0.000	0.031		0.060–0.234
H10a: CEE $\rightarrow$ SP $\rightarrow$ FP	0.303	6.607	0.000	0.046		0.150–0.428
H10b: GC $\rightarrow$ SP $\rightarrow$ FP	0.133	4.669	0.000	0.029		0.057–0.206
Control variables	0.147	2.744	0.006	0.054		−0.007–0.317
Note(s): *CEE – corporate environmental ethics; GC – green creativity; FP – financial performance; SP – sustainable production; GCA – green competitive advantage Source(s): Authors’ own work						

Table 6.
Hypothesis testing

5. Discussion

This study investigates corporate environmental ethics and green creativity as antecedents of green competitive advantage, financial performance and sustainable production. Similar to the findings of [Chen and Chang \(2013\)](#), the effects of corporate environmental ethics on green competitive advantage and sustainable production were positive and significant. Further supporting our findings, other scholars suggest that firms with environmental ethical cultures nurture green capabilities leading to green competitiveness and efficient implementation of sustainable production initiatives ([Singh et al., 2019](#); [Guo et al., 2020](#); [Aftab et al., 2022](#); [Baah et al., 2020, 2021a](#)). Contrary to past findings, corporate environmental ethics negatively influence financial performance. The finding suggests that investments in the adoption of environmental ethical cultures can be enormous and thus can drain or negatively impact a firm's finances ([Guo et al., 2020](#)). [Bag et al. \(2022\)](#) assert that intensive ethical orientations in the form of training and auditing can negatively affect firm performance. Although ethical environmental orientations may require substantial investments in the initiation phase, firms will offset these investment costs in the long-term, thus boosting financial performance.

Green creativity positively and significantly influences green competitive advantage, financial performance and sustainable production. [Chen et al. \(2009\)](#) and [Chang \(2011\)](#) assert that green creativity stimulates novel thinking which contributes to firm performance. [Jia et al. \(2018\)](#) connote that firms that possess green creativity can achieve green competitiveness. We explain further that green creativity drives green competitive advantage, sustainable production and financial performance of a firm as well as allows the implementation of novel ideas which respond to environmental concerns and needs of stakeholders and the firm, leading to improved firm performance. Moreover, while several scholars capture the individual influences of corporate environmental ethics and green creativity on firms' performance, the study findings show that integrating the two concepts presents enormous gains for competitiveness, sustainable production and financial performance thereby presenting a unique strategy for optimizing sustainable business initiatives and performance.

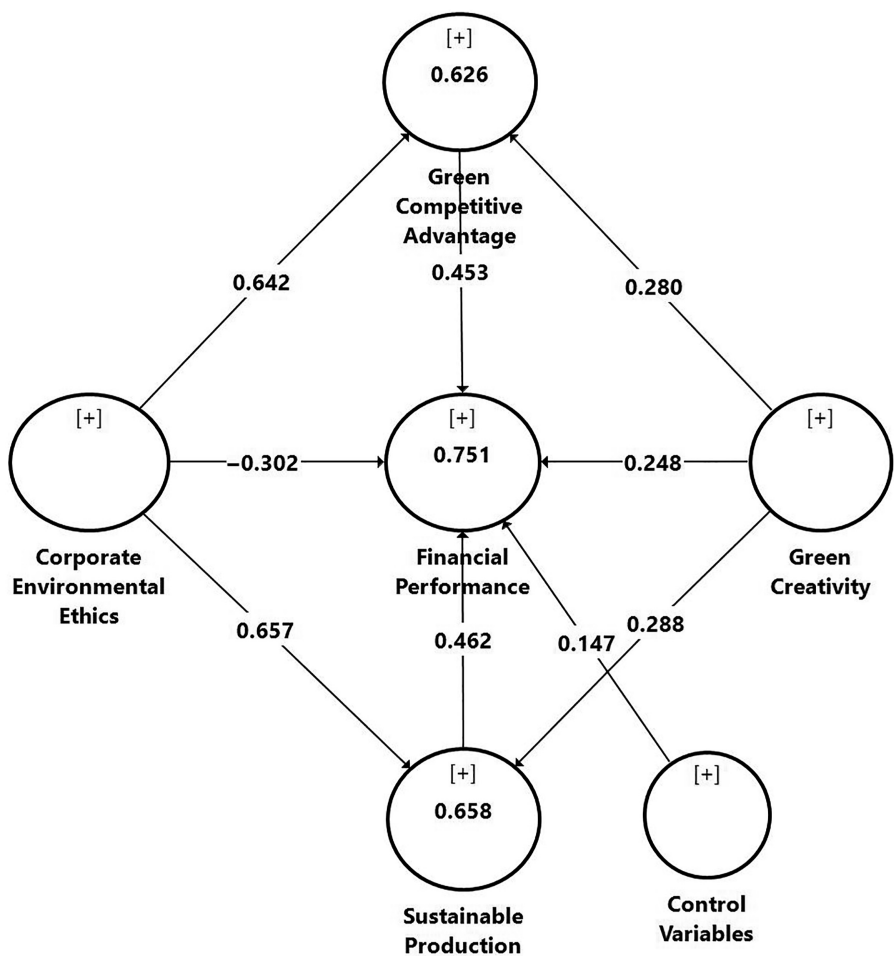


Figure 2.
Structural model

Source(s): Authors' own work

Additionally, this study provides insights into how the relationship between corporate environmental ethics, green creativity and financial performance can be strengthened by via the indirect effects of sustainable production and green competitive advantage. Several studies have investigated how firms develop and improve financial performance (Zameer *et al.*, 2020; Zhang *et al.*, 2011), but few studies have investigated how sustainable production and green competitive advantage indirectly improve the relationships. The results show that green competitive advantage and sustainable production in the Ghanaian context do serve as partial mediators in strengthening the associations between corporate environmental ethics, green creativity and financial performance. This suggests that firms that have an environmentally ethical culture and possess green creativity can achieve higher financial performance through sustainable production and green competitiveness.

5.1 *Contribution to theory*

The empirical examination of the proposed model offers unique insights into how corporate environmental ethics and green creativity drive financial performance through sustainable production and green competitive advantage. Drawing on the theory of organizing and NRBV, this study establishes green competitive advantage and sustainable production as significant mediators in the relationships between corporate environmental ethics, green creativity and financial performance. Thus, adding to the corporate environmental ethics and financial performance literature, we reveal mechanisms through which firms can improve financial performance. Moreover, the integration of corporate environmental ethics and green creativity can be a unique strategy for organizations to fulfill stakeholder and firm environmental needs, thereby mitigating environmental risk and other related liabilities.

Moreover, this study provides empirical evidence concerning how SMEs operating in emerging economies use corporate environmental ethics to acquire rare, inimitable, valuable, and non-substitutable resources and use green creativity to develop these resources in an effort to improve sustainable production, green competitive advantage and financial performance. In particular, the acquisition of such rare, inimitable, valuable and non-substitutable resources enables SMEs to compensate for resource scarcity through the efficient use of available resources while also utilizing green competitive advantage to form strong collaborations and alliances that allow sustainable production and positive firm results. This further suggests that corporate environmental ethics and green creativity can be innovatively leveraged by SMEs to access competitive resources and meet stakeholder environmental demands.

5.2 *Contribution to practices and policy*

The findings of the study provide several practical suggestions to managers and policymakers. First, managers can minimize environmental risks by using environmentally ethical cultures as means of building trust with stakeholders, attracting green investors and credit, and proactively responding to environmental concerns. Secondly, by means of ethical cultures and green creativity, manufacturing firms in the Ghanaian context can ensure employee innovativeness which enables quick and cost-effective responses to market changes and uncertainties. Third, the study indicates that managers should not give up on ethical investments if immediate returns are not achieved but should make continuous efforts to achieve positive long-term outcomes which strengthen green competitive advantage and creativity, sustainable production and financial performance. Fourth, manufacturing firms can leverage their environmentally ethical cultures and creativity to strengthen collaborations and trust with industry stakeholders, policymakers and government agencies to gain legitimacy.

In terms of policy, Ghana is gradually transitioning towards green practices and sustainable initiatives as evidenced by the implementation of policies such as the National Plastic Management Policy and Global Plastic Action Partnership (GPAP) and its proactive roles in co-chairing the United Nations (UN) advocate program. To sustain and boost this transition, policymakers can collaborate with manufacturing firms to promote ethical cultures via offering environmental rebates, subsidies and support that encourage firm green proactiveness. In addition, the government and other policymakers can make policies that instruct adherence to and implementation of ethical cultures for firms and industries. By so doing, government and other policymakers can create avenues for SMEs and large firms to engage and collaborate in terms of building effective ethical cultures that nurture green creativity and boost sustainability.

5.3 *Limitation and future research direction*

Similar to other studies, this study has some limitations that must be addressed. To start with, the study was conducted in Ghana which suggests that the findings cannot

be generalized. As such, we recommend that future research examine the proposed model in other countries to provide more insights. While we rely on data from SMEs, other studies can also use large firms or a combination of both to contribute to the environmental ethics–firm performance literature. Data were collected using cross-sectional and self-reported survey designs which can present major issues of response and common method bias. Based on this, we suggest that future studies can use a longitudinal approach to data collection to further improve and ensure model quality, reliability and validity. Lastly, we recommend other scholars integrate other firm concepts into the proposed model to understand firm-related variables that also predict performance.

6. Conclusion

Drawing insights from the ethical theory of organizing and the NRBV, the study examines whether corporate environmental ethics and green creativity drive green competitive advantage, sustainable production and financial performance in an emerging context. Using responses of managers in 290 manufacturing firms in Ghana, we tested a novel model that indicated that corporate environmental ethics and green creativity are crucial antecedents for higher competitiveness, sustainable production practices and financial performance. Jointly, the adopted study variables predicted 0.751 of the variance of financial performance indicating how crucial they are to business operations. While green creativity, green competitive advantage and sustainable production had positive impacts on financial performance, the impact of corporate environmental ethics was negative and significant. This portrays that firms that aim for higher environmentally ethical cultures must make huge investments that place finances under pressure.

The study also demonstrates that the relationship between corporate environmental ethics, green creativity and financial performance is mediated by green competitive advantage and sustainable production. This further shows that green competitive advantage and sustainable production may be essential tools for firms in strengthening ethical cultures and green creativity while also promoting their financial outcomes. Perceiving that resources are a top issue for businesses today especially firms operating in emerging markets, managers must respond to environmental stakeholders' concerns to improve sustainable practices, competitiveness and financial performance via having trustworthy relationships with diverse stakeholders.

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