Article:
Appiah, L.O. and Essuman, D. orcid.org/0000-0003-1838-2505 (2024) How do firms develop and financially benefit from green product innovation in a developing country? Roles of innovation orientation and green marketing innovation. Business Strategy and the Environment, 33 (7). pp. 7241-7252. ISSN 0964-4733

https://doi.org/10.1002/bse.3864

Received: 26 May 2023 | Revised: 11 March 2024 | Accepted: 16 June 2024

DOI: 10.1002/bse.3864

RESEARCH ARTICLE

Business Strategy and the Environment

WILEY

How do firms develop and financially benefit from green product innovation in a developing country? Roles of innovation orientation and green marketing innovation

Listowel Owusu Appiah[1,2] | Dominic Essuman[3,4]

[1]Faculty of Business Education, Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development, Kumasi, Ghana

[2]Center for Applied Research and Innovation in Supply Chain-Africa, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

[3]Sheffield University Management School, The University of Sheffield, Sheffield, UK

[4]Gordon Institute of Business Science, University of Pretoria, Johannesburg, South Africa

Correspondence
Listowel Owusu Appiah, Faculty of Business Education, Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development, Kumasi, Ghana; Center for Applied Research and Innovation in Supply Chain-Africa, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.
Email: loappiah@aamusted.edu.gh; bralisto@live.com

Abstract

While previous research has explored the antecedents and outcomes of green product innovation, empirical evidence remains inconclusive. This study draws on the contingent natural resource–based view to conceptualize how innovation orientation enables firms to develop green product innovation to enhance financial performance, especially where they emphasize green marketing innovation. The study tests its hypotheses using primary survey data from 347 small and medium enterprises (SMEs) in Ghana and PROCESS as an analytical tool. The results suggest that innovation orientation has a positive relationship with green product innovation and that green product innovation mediates the relationship between innovation orientation and financial performance. Additional results indicate that green product innovation contributes more to financial performance under increasing levels of green marketing innovation. The article sheds new light on how firms can combine innovation orientation, green product innovation, and green marketing innovation to boost financial performance in a developing country.

KEYWORDS
contingent natural resource–based view, Ghana, green innovation, green marketing innovation, innovation orientation, low-resource context

1 | INTRODUCTION

The negative environmental impact of business operations has sparked conversations about how companies can integrate ecological sustainability into their operations (Chang, 2019). Scholars recognize green innovation as a crucial driver of sustainability at the firm and national levels (Appiah, 2024; Farooq et al., 2021). In particular, the literature suggests that firms can simultaneously achieve environmental and economic goals by embracing green product innovation (Abadzhiev et al., 2022; Khan et al., 2021). Green product innovation entails creating new products with minimal environmental impact across their lifecycle (Sellitto et al., 2020).

Firms' strategic orientations critically determine their resource allocation decisions and performance outcomes (Wang et al., 2022); thus, environmental management scholars have keenly explored the roles of strategic orientations in driving green innovations (Ghassim &

Abbreviations: AVE, average variance extracted; CFI, comparative fit index; CI, confidence interval; CMB, common method bias; CR, composite reliability; DF, degree of freedom; EPA, Environmental Protection Agency – Ghana; GMI, green marketing innovation; GPI, green production innovation; IO, innovation orientation; LLCI, lower limit confidence interval; NGOs, non-governmental organizations; NNFI, non-normed fit index; NRBV, natural resource-based view; RMSEA, root mean square error of approximation; SD, standard deviation; SMEs, small and medium enterprises; SRMR, standardized root mean residual; ULCI, upper limit confidence interval; β, unstandardized regression coefficient; χ^2, chi-square.

Bogers, 2019; Zhang & Walton, 2017). This literature covers different strategic orientations, including sustainability orientation (Aboelmaged, 2018; Cheng, 2018), entrepreneurial orientation (Habib et al., 2020), environmental orientation (Fatoki, 2021), and market orientation (Borah et al., 2023; Leal-Rodríguez et al., 2017). However, how innovation orientation, a critical aspect of the strategic orientation concept, enables firms to develop green product innovation to achieve financial performance improvement objectives under specific organizational circumstances remains underexplored (Farooq et al., 2021). Innovation orientation refers to an organization-wide strategic disposition toward developing novel products, services, and operations (Farooq et al., 2021).

Green product innovation is resource-intensive, and business executives are concerned about how and when expanding investment in green product innovation enhances financial performance (Khan et al., 2021). Thus, the relationship between green innovations and financial performance has attracted scholarly work lately, although the evidence is inconclusive. For example, while some studies find the relationship to be positive (e.g., Lin et al., 2019; Tariq et al., 2018), others find it to be negative (e.g., Yao et al., 2019) or insignificant (e.g., Aguilera-Caracuel & Ortiz-de-Mandojana, 2013; Duque-Grisales et al., 2020). While this issue requires additional theoretical and empirical analyses, past studies have proposed contingency models to clarify the complexities associated with the relationship between green innovations and financial performance. For instance, the literature suggests that the firm performance outcomes of green innovations are moderated by environmental turbulence (Tariq et al., 2018), environmental regulations (Aguilera-Caracuel & Ortiz-de-Mandojana, 2013), absorptive capacity (Xue & Boadu, 2019), R&D investment (Duque-Grisales et al., 2020), environmental pressure (Yao et al., 2019), firm size (Lin et al., 2019), market uncertainty (Chu et al., 2018), resource commitment (Li, 2014), and environmental dynamism (Chan et al., 2016).

Though green product innovation is market-centered, past studies have largely overlooked the moderating roles of firms' marketing resources and activities in clarifying the relationship between green product innovation and financial performance. Green marketing innovation is now popular in sustainability literature (Borah et al., 2023). Yet, there is no concrete understanding of how it combines with green product innovation to enhance financial performance (Roh et al., 2022). This study argues that green marketing innovation, the extent to which marketing activities incorporate environmental management practices, may function as a critical organizational condition that can enable firms to effectively realize the economic and market value associated with green product innovation (Borah et al., 2023), especially in developing economies, where consumers' awareness of and preferences for green products are generally low (Appiah, 2023).

Against this background, this study examines the following question in a developing country: *How does innovation orientation enable firms to develop green product innovation to achieve enhanced financial performance when they emphasize green marketing innovation?* In answering this question, the study uses the natural resource–based view (NRBV) to develop the argument that while innovation orientation is a crucial firm resource that can drive green product innovation, green product innovation serves as a generative mechanism via which innovation-oriented firms achieve superior economic and market value (Hart, 1995; Hermundsdottir & Aspelund, 2020). In recognizing that product innovation is not universally beneficial (Aguilera-Caracuel & Ortiz-de-Mandojana, 2013; Tariq et al., 2018), the study extends the contingency theory to the NRBV to advance the proposition that the contribution of green product innovation to financial performance in a developing country strengthens under increasing levels of green marketing innovation (Aragón-Correa & Sharma, 2003). Testing these propositions in a developing country, Ghana, allows the study to make the following three contributions:

First, in expanding knowledge of the roles of strategic orientations in environmental management and the literature on the antecedents of green product innovation (e.g., Kawai et al., 2018; Lisi et al., 2020), this study sheds new light on how innovation-oriented firms may succeed with green product innovation projects. Second, the study demonstrates how innovation orientation interfaces with green product innovation to explain financial performance. Specifically, the study shows how innovation orientation empowers firms to achieve enhanced green product innovation, boosting their financial performance. Third, the study contributes to the literature on the contingencies underlying the green product innovation–financial performance link (e.g., Duque-Grisales et al., 2020; Xue & Boadu, 2019) by identifying green marketing innovation as a crucial factor determining when firms benefit from green product innovation (Seman et al., 2019). To this end, the study's empirical analysis broadens the limited literature on the antecedents and outcomes of green product innovation in developing countries (Khan et al., 2021).

2 | THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1 | Innovation orientation

Innovation orientation provides a context for firms to implement growth-based strategies via innovation (Dobni, 2010), and it manifests in terms of a firm's strategic disposition toward developing novel products, services, and operations for its target market (Dobni, 2010; Ionescu & Ionescu, 2015). Innovation orientation comprises an organization's learning philosophy, strategic direction, and cross-functional beliefs that define and guide its strategies and actions toward developing specific innovation-enabling competencies and processes (Siguaw et al., 2006). While various conceptualizations of innovation orientation exist in the literature, this study adopts the perspective of Siguaw et al. (2006), framing innovation orientation as a knowledge structure' rather than a mere amalgamation of norms and behaviors. Literature suggests that innovation orientation is a crucial resource for overcoming issues that limit the adoption of new systems, products, and processes (Chen et al., 2009; Hurley & Hult, 1998).

2.2 | Green product innovation

Green product innovation involves creating products that minimize environmental impacts throughout their lifecycle. These products use non-polluting materials; are built with specifications featuring modular components for easy disassembly, recycling, and reuse; and employ returnable, reusable packaging (Sellitto et al., 2020). Green products conserve resources, reduce environmental impacts and risks, and minimize waste generation (Awan et al., 2021). A firm can improve its product design, quality, and reliability through green product innovation to achieve environmental goals (Chang, 2011). This study conceptualizes green product innovation as the extent to which firms develop or improve their products to reduce negative environmental impacts (Chen et al., 2006).

2.3 | Green marketing innovation

Green marketing actions require firms to cooperate with downstream partners to inform and educate consumers about the nature of green products and the benefits therein. By adopting innovative marketing strategies and practices, firms can align their business objectives with ecological concerns, differentiate themselves in the market, and contribute to the preservation of the environment. Green marketing innovation is core to green marketing, and it involves developing and implementing novel marketing strategies and practices that promote environmentally sustainable products, services, and behaviors (Prieto-Sandoval & Torres-Guevara, 2022). Green marketing innovations involve consumer education, creating consumer green communities, and understanding consumer diversity (Prieto-Sandoval & Torres-Guevara, 2022). This study conceptualizes green marketing innovation as the extent to which a firm engages in marketing actions that espouse the environmental benefits of its products and processes. By adopting green marketing innovation, firms can effectively communicate their commitment to environmental sustainability and engage customers in making environmentally responsible purchasing decisions (Appiah, 2019).

2.4 | Conceptual model and contingent NRBV

The study combines the NRBV with the contingency theory, termed contingent NRBV (Aragón-Correa & Sharma, 2003), to propose a conceptual model to examine the relationships among innovation orientation, green product innovation, green marketing innovation, and financial performance. As illustrated in Figure 1, the study theorizes that innovation-oriented firms are more likely to improve green product innovation, which enables them to be financially successful, especially when they embark on green marketing innovation.

The NRBV argues that the basis for obtaining market and economic advantages is embedded in resources that enable firms to develop and market green products. Product stewardship, which manifests through green product innovation and green marketing innovation, can generate new value-additions for customers and bolster a firm's reputation in the market (Hart, 1995; Lisi et al., 2020). Consistent with the resource-based literature, the NRBV recognizes that while green product innovation may contribute to financial performance (Aragón-Correa & Sharma, 2003), its levels are contingent on relevant firm-specific resources (Melander, 2017), such as innovation orientation (Chen et al., 2009; Hurley & Hult, 1998).

The contingent NRBV acknowledges the critical importance of natural resources and the contextual contingencies in shaping the relationships between green innovations and financial performance outcomes (Aragón-Correa & Sharma, 2003). This view extends the NRBV by emphasizing that the economic and market value of green product innovation depends on internal or external factors (Hermundsdottir & Aspelund, 2020). Specifically, the contingent NRBV argues that a "fit" between green product innovation and the

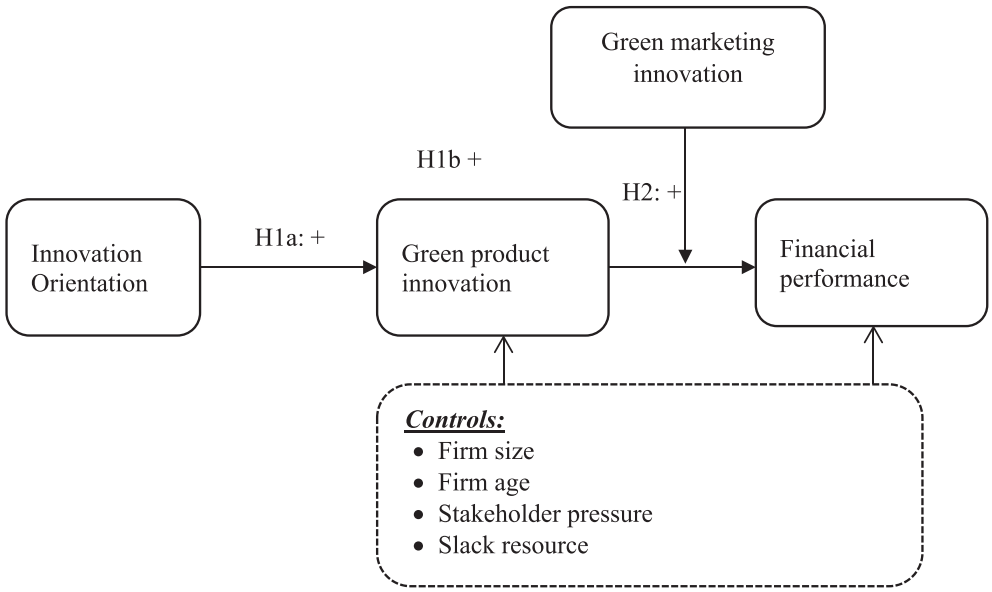

FIGURE 1 Research model.

context under which it is implemented may boost financial performance (cf., Brandon-Jones et al., 2014). Accordingly, while green marketing innovation helps firms align their green products with market requirements (Prieto-sandoval & Torres-guevara, 2022), this study argues that a high level of green marketing innovation creates a conducive environment where firms can market and extract economic value from green product innovation.

2.5 | Innovation orientation, green product innovation, and financial performance

Recent environmental management research suggests that strategic orientations, such as innovation orientation, influence investment in green innovations (Wang et al., 2022). Innovation orientation is a "knowledge structure rather than an amalgamation of norms and behaviors" that begets innovation actions (Siguaw et al., 2006, p.560). Organizations with a greater level of innovation orientation foster the acquisition of competencies that support innovation endeavors (Chen et al., 2009). Firms' innovation orientation supports the development of a culture of openness to new ideas (Ayuso et al., 2011), which is crucial to developing green innovations. This culture of openness is consistent with the idea of open innovation and recent studies on how internal and external collaborations and knowledge search support the development of green innovation (Hofman et al., 2020; Song et al., 2020).

Innovation orientation may be beneficial for driving green innovation in developing countries, where firms tend to encounter high resource constraints and limited pressure to embark on green product innovation projects (Appiah, 2023). We contend that in such countries, innovation-oriented firms are more likely to be early adopters of green product innovation ideas due to their proactiveness and willingness to take risks (Siguaw et al., 2006). Not only can innovation orientation help firms in such markets explore and exploit opportunities for developing green product innovation, but it can also enable them to overcome the uncertainties associated with unproven methods for developing green innovation products (Dobni, 2010; Hurley & Hult, 1998; Ionescu & Ionescu, 2015). Therefore, the study posits that:

> **H1a.** Innovation orientation has a positive relationship with green product innovation.

Furthermore, we contend that the capacity of innovation orientation to drive green product innovation can translate into improved financial performance. As a dispositional factor, innovation orientation's potential to benefit financial performance can be realized through its ability to enable firms to produce innovative outputs (Dobni, 2010; Farooq et al., 2021; Ionescu & Ionescu, 2015). The NRBV suggests that firms that direct their strategic orientation toward developing environmentally friendly products can obtain significant benefits that include financial rewards (Hart & Dowell, 2011). A firm's innovation orientation provides a useful direction for developing green innovations, which in turn can provide financial benefits. Specifically, innovation orientation directs firms toward reinforcing and transforming knowledge to develop innovative green products (Siguaw et al., 2006). The product stewardship role of green product innovation might enable the firm to reap significant financial benefits (Hart, 1995). Green product innovation is linked to financial benefits arising from a reduced cost of production, increased firm reputation, and increased patronage from environmentally conscious consumers (Xie et al., 2019). In line with these arguments, some previous studies show that green innovations benefit financial performance (e.g., Lin et al., 2019; Tariq et al., 2018). Therefore, innovation-oriented firms can achieve superior financial performance by emphasizing green product innovation. Formally stated, the study argues that:

> **H1b.** Green product innovation positively mediates the relationship between innovation orientation and financial performance.

2.6 | The moderating role of green marketing innovation

While prior studies reveal green innovation is not always beneficial (e.g., Duque-Grisales et al., 2020; Yao et al., 2019), the contingent NRBV suggests that the impact of green product innovation on performance hinges on certain contextual factors (Aragón-Correa & Sharma, 2003). This study proposes green marketing innovation as a crucial contingent variable that may moderate the relationship between green product innovation and financial performance. Green marketing innovation enables firms to integrate ecological considerations into their marketing activities to address pressing environmental issues (Prieto-Sandoval & Torres-Guevara, 2022).

The argument that firms that introduce green innovative products may gain advantages in the market assumes that consumers are green-conscious and willing to pay a premium for such products (Amores-Salvadó et al., 2014; Hart & Dowell, 2011). This reasoning may hold in developed countries, where consumers' green awareness and prioritization of green products are high, and the market tends to compete based on firms' green initiatives. Consumers in developing countries, particularly those in Sub-Saharan Africa, have relatively little knowledge, experience, education, and interest in these environmental issues (Appiah & Abul- Majeed, 2021). This issue makes it challenging for firms in these contexts to obtain superior financial benefits from their green product innovation efforts.

Prior research suggests that green product innovation may only pay off when promoted adequately (Amores-Salvadó et al., 2014). Llerena (2011) argues that consumers, unless provided with more information, will tend to value remanufactured products less than conventional products. Firms must often introduce green marketing strategies to customers to elicit positive consumer responses and alter purchasing behaviors (Zhu & Sarkis, 2016). Therefore, this study argues that green product innovation's success in driving financial

performance in a developing country may increase in firms that engage in more innovative green marketing campaigns. Firms with high levels of green marketing innovation can better match their green products to the customers' needs and better understand the channels through which consumers can be educated about these products (Roh et al., 2022).

Conversely, low green marketing innovation may be associated with a disconnect between green product offerings and customer knowledge of these offerings, which may result in suboptimal sales revenue. Firms with limited green marketing innovation may struggle to convey the value of their environmentally friendly products to consumers. As a result, the outcome of green product innovation might be weaker for them. Based on the contingent NRBV, this study posits that firms with high levels of green marketing innovation are better positioned to obtain superior economic benefits from their green product innovation than those with low green marketing innovation. Based on this premise, the following hypothesis is proposed:

> **H2.** Green marketing innovation positively moderates the relationship between green product innovation and financial performance, such that the positive indirect relationship between innovation orientation and financial performance via green product innovation strengthens under high green marketing innovation conditions.

3 | METHODS

3.1 | Sample and data collection

The study's sample comprises small and medium-sized manufacturers in Ghana. Small and medium-sized enterprises (SMEs) are dominant players in Ghana's private sector, whose activities contribute significantly to the country's rapid economic growth in Sub-Saharan Africa (World Bank Group, 2018). Ghana's stable political climate and open economy system make it a viable destination for foreign investment and a beneficial environment for the development of local SMEs (Danso et al., 2019; Ofori-Dankwa & Julian, 2013). Moreover, Ghana has been on a path toward industrialization since 2017, backed by the government's "one district, one factory" agenda to increase the country's industrialization capacity and output. However, the resulting growth in industrial activities is associated with environmental challenges (Meirun et al., 2021) that add to the country's existing challenges in its manufacturing and extraction sector. Ghana is one of the poorest-performing countries in the world on environmental health and ecosystem vitality (Wolf et al., 2022). These challenges require scholarly attention to how firms can develop green innovation products to improve environmental sustainability while driving financial performance.

Following the examples of past studies, we relied on survey data to overcome the challenges of obtaining secondary data from SMEs in developing countries (e.g., Appiah & Obey, 2023; Danso et al., 2019; Essuman et al., 2023). The data were collected from SMEs in four industrialized geographical areas in Ghana — Greater Accra, Western, Ashanti, and Northern regions. In addition, the sample comprises firms that operated for at least 3 years before the data collection exercise in September 2022. Having defined the sample inclusion criteria, we followed a purposive sampling approach to collect the data (e.g., Essuman et al., 2023). This approach entailed using company location addresses sourced from local online databases, such as ghanayello.com and ghanaweb.com. We visited firms that were geographically accessible, presented survey instruments, and negotiated for consent (Essuman et al., 2023). One key informant, consisting of top/senior managers (e.g., CEOs) from each firm, provided the data. The study obtained 376 firm-level responses after 3 months of data collection exercise. Following face analysis and examination of missing values, 347 were considered usable. The average number of employees per firm was 54, and the average firm age was 12 years. These characteristics are similar to those reported in the Regional Spatial Business Report (Ghana Statistical Service, 2016) and other research studies conducted in the research context (e.g., Boso et al., 2017; Essuman et al., 2023).

3.2 | Survey bias assessment

Because the responses were from four different regions, an independent sample *t*-test was conducted to determine if there were significant differences in the firms in terms of demographics (firm size and firm age) and substantive variables (green product innovation and financial performance). The results reveal no significant differences in data based across the regions. Therefore, the data were pooled together to test the hypotheses.

The study implemented relevant procedural and statistical remedies to address common method bias (CMB) (Podsakoff et al., 2012). First, we placed the indicators for innovation orientation, green product innovation, green marketing innovation, and financial performance wide apart in the questionnaire by introducing other indicators to mitigate potential artifactual correlations (Podsakoff et al., 2003, 2012). Also, to minimize the potential of social desirability bias and ensure the honesty of responses, the fieldwork's cover letter explained the study's purpose and practical relevance while guaranteeing respondent anonymity and response confidentiality. Moreover, the questionnaire did not ask for any firm-specific information that could be used to trace the information provided to the organizations.

The study examined potential CMB by performing exploratory and confirmatory factor analyses (Podsakoff et al., 2003). An unrotated exploratory factor analysis revealed multiple factors, with the first accounting for only 22.9% of the variance. A covariance-based confirmatory factor analysis (CFA) in LISREL further confirmed that an unmeasured common factor does not explain the data, given that a one-factor CFA model poorly fits the data: Chi-square (χ^2) = 2090.96, degree of freedom (df) = 140, normed χ^2 = 14.93, root-mean-square error of approximation (RMSEA) = 0.201, standardized root mean residual (SRMR) = 0.158, non-normed fit index (NNFI) = 0.368, and comparative fit index (CFI) = 0.422. These results suggest that

common method bias may not inflate or deflate the results for the hypothesized relationships in the study (Podsakoff et al., 2003).

3.3 | Measures

The study ensured data reliability and validity by relying on past studies to identify relevant indicators to capture the constructs. We reviewed the initial pool of items and modified them, where necessary, to ensure they were appropriate for the study's context. We employed concise multi-item scales to capture the substantive constructs to ensure content validity while minimizing measurement issues associated with respondent fatigue.

3.3.1 | Substantive constructs

We adapted three items from Chen et al. (2006) to measure green product innovation. Four items were adapted from Sellitto et al. (2020) to measure green marketing innovation. Three items were adapted from Tong and Rahman (2022) to capture innovation orientation. The informants used a seven-point scale ranging from "strongly disagree (= 1)" to "strongly agree (=7)" to evaluate these items. Financial performance was measured with three items, adapted from Danso et al. (2019). Using a seven-point scale ranging from "far below industry average (=1)" to "far above industry average (=7)," the informants evaluated their firms' profitability in relation to industry average.

3.3.2 | Control variables

Past studies suggest that green product innovation and financial performance are affected by firm characteristics (Lin et al., 2019), stakeholder pressures (Yao et al., 2019), and slack resources (Leyva-de la Hiz et al., 2019). Thus, this study controlled for the effect of firm size and age, stakeholder pressure, and slack resources. We operationalized firm size as the natural log of the number of full-time employees and firm age as the natural log of the number of years a firm has operated. Stakeholder pressure was measured by asking informants to indicate on a seven-point scale (i.e., 1 = not at all; 7 = to a very large extent) the extent to which their firms face environmental pressure from government agencies, non-government organizations, and local communities. Slack resource was measured with three items adapted from Essuman et al. (2022). Using a seven-point scale ranging from "strongly disagree (= 1)" to "strongly agree (=7)," the informants evaluated their firms' level of uncommitted resources.

3.4 | Analytical approach

Before testing the hypotheses, we employed a covariance-based CFA to examine the reliability and validity of the study's measurement indicators. Covariance-based CFA allows researchers to analyze the extent to which theoretically specified measurement models fit a piece of empirical data while controlling for measurement errors (Hair et al., 2014). We used LISREL 11 to perform this analysis.

After validating the measures, the study followed the examples of previous environmental management studies (e.g., Qiao et al., 2022) to apply Hayes' SPSS PROCESS 3.5 macro to test the hypotheses. Due to its bootstrapping and data visualization capabilities, PROCESS is suitable for analyzing and interrogating conditional process models, such as this study's model (Figure 1) (Hayes & Rockwood, 2020). We employed PROCESS Model 4 to test the direct and indirect effect hypotheses (H1a and H1b) and Model 14 to test the moderated indirect effect hypothesis (H2). We used a 5000 bootstrap sample and a 95% confidence interval to evaluate the hypotheses (Hayes & Rockwood, 2020).

4 | EMPIRICAL ANALYSIS AND RESULTS

4.1 | Reliability and validity tests

We performed a multi-CFA model to examine the psychometric properties of the measures. The model shows an acceptable fit to data: $\chi^2 = 330.76$; DF = 120; normed $\chi^2 = 2.756$; RMSEA = 0.071; SRMR = 0.063; NNFI = 0.915; CFI = 0.933 (Hair et al., 2014). As shown in Table 1, all factor loadings are above 0.70, and their associated composite reliability and average variance extracted (AVE) are above 0.60 and 0.50, respectively, indicating high measure reliability and convergent validity (Fornell & Larcker, 1981; Hair et al., 2014). Further analysis reveals that the square roots of the AVEs are greater than the inter-construct correlations (see Table 2), indicating that the measures exhibit discriminant validity (Fornell & Larcker, 1981).

4.2 | Hypothesis testing

Table 2 shows the descriptive statistics and inter-correlations for the variables included in the analysis. The PROCESS results, generated based on the procedures outlined in Section 3.4, are shown in Tables 3, 4, and 5. Consistent with H1a, the results in Table 3 indicate that innovation orientation positively relates to green innovation, given $\beta = 0.131$, 95% bootstrap CI: 0.052–0.210. The results also show that green product innovation has a positive relationship with financial performance, given $\beta = 0.183$, 95% bootstrap CI: 0.078–0.288). Importantly, the results indicate that green product innovation positively mediates the relationship between innovation orientation and financial performance, given that the 95% confidence interval associated with the indirect effect does not include zero: $\beta = 0.031$, 95% bootstrap CI: 0.004–0.073). These results support H1b.

Additional results in Table 4 show that green marketing innovation positively moderates the relationship between green product innovation and financial performance, given $\beta = 0.156$, 95% bootstrap CI: 0.083–0.230. A simple slope analysis using PROCESS indicates that the relationship is positive and stronger at +1 standard deviation of green marketing innovation ($\beta = 0.357$, 95% bootstrap CI: 0.225–0.490) but insignificant at −1 standard deviation of green marketing

TABLE 1 Measurement items and validity and reliability results.

Construct/measures (composite reliability; average variance extracted)	Factor loading	*T*-value
Innovation orientation (CR = 0.878; AVE = 0.709)		
Our management actively seeks innovative ideas	0.832	Fixed
Within our company, people are constantly thinking about new products or services that serve future needs	0.960	9.925
Our company is willing to invest in innovation	0.717	8.635
Green product innovation (CR = 0.828; AVE = 0.619)		
Our firm chooses materials that produce lower levels of pollution.	0.750	Fixed
Our firm chooses materials that consume the least amount of energy and resources.	0.743	12.809
Our firm uses the lowest possible amount of materials for manufacturing its products.	0.860	13.470
Green marketing innovation (CR = 0.856; AVE = 0.666)		
Our firm provides information on green features of products and processes to customers	0.838	Fixed
Our firm uses the packaging for eco-information	0.884	16.840
Our firm has a reuse or return policy for products	0.719	13.560
Our firm fosters longstanding relationships with customers[a]	-	-
Financial performance (CR = 0.814; AVE = 0.594)		
Overall profitability	0.748	Fixed
Net profit margin	0.757	12.469
Return on investment (ROI)	0.807	12.833
Slack resources (CR = 0.853; AVE = 0.661)		
We have uncommitted financial resources that can quickly be used to fund new strategic initiatives	0.791	Fixed
We are often able to obtain financial resources at short notice to support new strategic initiatives.	0.886	13.623
Our company usually has a reasonable amount of financial resources in reserve.	0.758	11.981
Stakeholder pressures (CR = 0.831; AVE = 0.623)		
Pressure from government entities (e.g., EPA)	0.727	Fixed
Pressure from NGOs and environmental activists	0.884	10.775
Pressure from local communities	0.748	10.843

Abbreviations: NGOs, non-governmental organizations; EPA, Environmental Protection Agency.
[a]Dropped due to weak face validity.

innovation ($\beta = -0.009$, 95% CI: −0.124 – 0.143). Figure 2 presents a visual representation of these results.

Moreover, as shown in Table 5, the index of moderated mediation (Hayes & Rockwood, 2020) associated with the indirect effect of innovation orientation through green product innovation on financial performance under varying conditions of green marketing innovation was positive and significant: index = 0.020, 95% bootstrap CI = 0.005–0.056. A simple slope analysis further indicates that the indirect relationship is positive and stronger at +1 standard deviation of green marketing innovation (indirect $\beta = 0.047$, 95% bootstrap CI: 0.008–0.060) but insignificant at −1 standard deviation of green marketing innovation ($\beta = -0.001$, 95% bootstrap CI = −0.038 – 0.035). These results support H2.

5 | DISCUSSION

5.1 | Theoretical contribution and implications

While green product innovation has increasingly become crucial for environmental management, business executives are interested in understanding its drivers and the conditions under which it could benefit their firms financially (Abadzhiev et al., 2022; Khan et al., 2021). This research draws on the literature on the roles of strategic orientations (Borah et al., 2023; Wang et al., 2022) and green marketing innovation (Borah et al., 2023; Roh et al., 2022) in environmental management to identify innovation orientation as an antecedent and moderator of green product innovation, respectively. The study specifically sought to answer the question: How does innovation orientation enable firms to develop green product innovation to achieve enhanced financial performance when they emphasize green marketing innovation?

The study argued that innovation orientation is a vital resource that can allow firms to proactively explore and convert new ideas and knowledge into innovative green products (Chen et al., 2009; Hurley & Hult, 1998). To this end, consistent with the NRBV, the study suggested that green product innovation is a transformative mechanism via which innovation-oriented firms can add value to their products and boost their reputation in the market to achieve improved financial performance (Hart, 1995; Lisi et al., 2020). Based on data from SMEs in a developing country, the study results support these arguments. SMEs in developing countries generally face significant resource constraints (Appiah, 2023), which makes innovation orientation vital for these firms to take risks in green product initiatives (Siguaw et al., 2006) to differentiate themselves to gain market and economic advantages (Xie et al., 2019).

The study's results support and broaden the domain of past studies that find strategic orientations (e.g., market orientation, entrepreneurial orientation, and environmental orientation) as critical drivers of green innovations (e.g., Borah et al., 2023; Fatoki, 2021; Habib et al., 2020; Leal-Rodríguez et al., 2017). Further, in support of the NRBV principles, the results reinforce evidence from past studies that find that green innovations benefit financial performance (Lin et al., 2019; Tariq et al., 2018) while contrasting with other evidence that suggests the contrary (Duque-Grisales et al., 2020; Yao et al., 2019).

This study further uncovers green marketing orientation as an important moderating factor that helps clarify the relationship between green product innovation and financial performance.

TABLE 2 Descriptive statistics, correlations, and discriminant validity.

Variables	1	2	3	4	5	6	7	8
1. Innovation orientation	*0.709*							
2. Green product innovation	0.179**	*0.619*						
3. Green marketing innovation	0.140**	0.202**	*0.666*					
4. Financial performance	0.236**	0.251**	0.272**	*0.594*				
5. Slack resource	0.028	0.062	0.175**	−0.179**	*0.661*			
6. Stakeholder pressure	0.146**	0.314**	0.314**	−0.010	0.140**	*0.623*		
7. Firm size (log)	0.140**	−0.014*	−0.122*	0.028	−0.106*	0.092	-	
8. Firm age (log)	0.093	0.112*	0.017	0.148**	−0.222**	−0.086	0.339**	-
Mean	4.99	4.74	4.39	4.92	4.16	3.95	54.53	12.44
Standard deviation	1.12	0.83	1.11	0.90	1.24	1.26	74.82	9.78

Note: Correlations are below the principal diagonal. Values on the principal diagonal are the square root of the extracted average variance.
*$p < .05$, and **$p < .01$.

TABLE 3 Direct and indirect effects.

	Green product innovation			Financial performance		
	β	Boot LLCI	Boot ULCI	β	Boot LLCI	Boot ULCI
Control variables						
Firm size	−0.070	−0.173	0.033	−0.003	−0.105	0.099
Firm age	0.183	0.034	0.333	0.073	−0.074	0.220
Slack resources	0.055	−0.017	0.126	−0.169	−0.239	−0.098
Stakeholder pressure	−0.007	−0.078	0.063	−0.045	−0.118	0.027
Main effects						
Innovation orientation (IO)	0.131	0.052	0.210	0.146	0.068	0.223
Green product innovation (GPI)				0.183	0.078	0.288
Green marketing innovation (GMI)				0.216	0.133	0.300
Interaction						
GPI × GMI				0.156	0.083	0.230
Indirect effects						
IO → GPI → financial performance				0.031	0.004	`0.073
R^2	5.3%			24.8%		

Abbreviations: LLCI, lower limit confidence interval; ULCI, upper limit confidence interval.

TABLE 4 Slope analysis of moderated effects.

Path	Levels of green market innovation	β	LLCI	ULCI
Green product innovation → Financial performance	Low (−1 SD)	0.009	−0.124	0.143
	High (+1 SD)	0.357	0.225	0.490

Abbreviations: SD, standard deviation; LLCI, lower limit confidence interval; ULCI, upper limit confidence interval.

TABLE 5 Slope analysis of moderated indirect effects.

Path	Levels of green market innovation	Indirect β	LLCI	ULCI
Innovation orientation → green product innovation → financial performance	Low (− 1 SD)	0.001	−0.038	0.035
	High (+1 SD)	0.047	0.008	0.060
Index of moderated mediation		0.020	0.005	0.056

Abbreviations: SD, standard deviation; LLCI, lower limit confidence interval; ULCI, upper limit confidence interval.

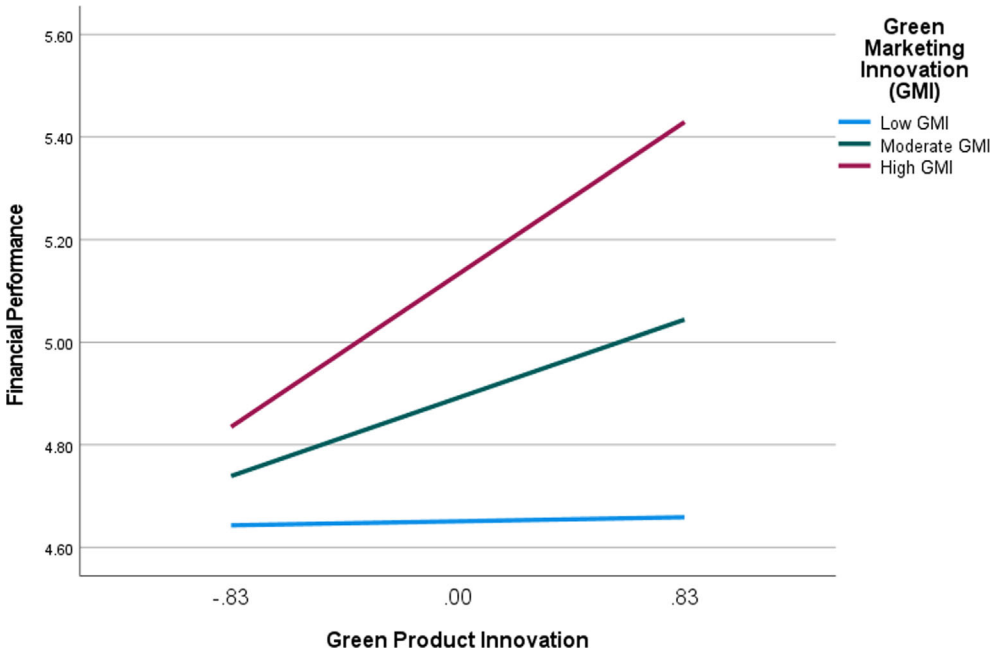

FIGURE 2 Moderating effect of green market innovation.

Specifically, the results indicate that the contribution of green product innovation to financial performance and its capacity to link innovation orientation to financial performance increases in firms that emphasize green marketing innovation. These results broadly support our contingent NRBV contention that greater levels of green marketing innovation can help firms align their green innovation activities with market requirements while better promoting innovative green products to consumers (Aragón-Correa & Sharma, 2003; Prieto-Sandoval & Torres-Guevara, 2022). As argued in this study, such a complementary role of green marketing innovation is vital in the study's setting, where green awareness is generally low (Appiah, 2019). These results support and add to the literature that demonstrates that the green innovation–financial performance link varies by context (e.g., Duque-Grisales et al., 2020; Tariq et al., 2018; Xue & Boadu, 2019).

In summary, this research shows that while green product innovation may account for heterogeneity in financial performance, its levels and contribution to financial performance depend on organizational factors, including innovation orientation and green marketing innovation, respectively. In particular, the study shows how using a conditional process perspective to model the interplay among innovation orientation, green product innovation, and green marketing innovation offers richer insights into the role and nuances of green product innovation in explaining differences in firms' financial performance in a developing country.

5.2 | Managerial implications

While SMEs are engines of sustainable development in developing, green product innovation can provide them with a means to address the growing environmental problem while pursuing their economic goals. To succeed in developing green innovative products, managers should recognize the importance of fostering a culture of openness and tolerance toward new ideas at all organizational levels. Continuous learning, participative decision-making, power sharing, and creating a collaborative organizational culture are effective ways to encourage innovation within the organization (Hurley & Hult, 1998). These practices can enable SMEs in high-uncertainty avoidance societies, such as Ghana, to forge strong innovation orientation to overcome the uncertainties associated with embracing new initiatives such as green product innovation.

The study results indicate that SMEs in developing countries can achieve superior financial performance by complementing green product innovation efforts with innovative marketing activities. Managers in such countries should recognize that their customers have yet to appreciate the value of green products fully; therefore, they must design novel ways of communicating the value associated with them. It is important they maintain ongoing interactions with customers and other stakeholders to establish a foothold in the market. Managers should create specific marketing plans tailored to promote their green products beyond traditional marketing strategies. It is essential to develop year-round themes to engage both existing customers and potential customers in discussions about the firm's new environmentally friendly products.

5.3 | Policy implications

The findings have implications for policymakers in developing countries seeking to drive environmentally focused innovations in firms to support sustainable development goals. Developing countries should develop robust national and industry-level policies on environmental management and innovation (e.g., intellectual property rights) to promote green product innovation through close collaboration with

SMEs. Such policies must address counterfeiting issues while rewarding SMEs for green product innovation efforts.

SMEs in developing countries lack the financial, human, and technological resources needed for embarking on green product innovation projects. While policy interventions that expand possibilities for SMEs to access such resources are necessary, the study's results suggest that innovation orientation is crucial. Market and non-market institutional actors can collaborate to orchestrate training programs to foster strong innovation orientation among SMEs.

The results show that green marketing innovation enhances the financial outcomes of green product innovations. Policymakers should, therefore, support the propagation of green news about firms that develop environmentally friendly innovations. This could be done by setting up national recognition and award platforms that help to promote these innovative organizations. Such strategies can increase firms' financial performance by increasing customer awareness and patronage while encouraging them to invest more in green product innovation.

6 | LIMITATIONS AND FUTURE DIRECTIONS

While the study identifies innovation orientation as a critical driver of green product innovation, other factors may also play a role. A budding stream of research has considered how the interrelationship between digital technologies and sustainability strategies can enhance sustainable corporate and country-level development (e.g., Abbate, Centobelli, & Cerchione, 2023; Costa & Matias, 2020). Future research should explore how such technologies can be deployed to support green innovation development (Shashi et al., 2021) in developing countries. There is also scope for research on how country-specific contextual issues (e.g., informal and formal institutional forces, such as culture and regulatory environment) may affect the deployment of these technologies to support green innovations. Future research may also expand the industrial scope of this study by examining how green innovations are developed in the health sector and how digital technologies will be useful in this regard (Abbate, Centobelli, Cerchione, Oropallo, & Riccio, 2023).

This study shows how innovation-oriented firms can improve financial performance through green product innovation. Future studies can extend this line of inquiry by exploring whether and when other green innovations (e.g., green process innovation) may intervene in the relationship between innovation orientation and financial performance.

In assuming that green awareness and product prioritization may be low in developing countries (Appiah, 2019), this study theorized and demonstrated how green marketing innovation may complement green product innovation to boost financial performance. We encourage future work to interrogate this assumption by explicitly capturing and analyzing how variability in customer green awareness moderates the relationship between green product innovation and financial performance.

The study uses cross-sectional survey data from a single country and industry, which limits our ability to make causal inferences from the results and generalize broadly. Future studies can address these issues using a longitudinal survey design and data from other contexts (e.g., SMEs from other developed and developing countries and large firms).

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

ORCID

Listowel Owusu Appiah https://orcid.org/0000-0003-0150-4211
Dominic Essuman https://orcid.org/0000-0003-1838-2505

REFERENCES

Abadzhiev, A., Sukhov, A., Sihvonen, A., & Johnson, M. (2022). Managing the complexity of green innovation. *European Journal of Innovation Management*, *25*(6), 850–866. https://doi.org/10.1108/EJIM-02-2022-0098

Abbate, S., Centobelli, P., & Cerchione, R. (2023). From fast to slow: An exploratory analysis of circular business models in the Italian apparel industry. *International Journal of Production Economics*, *260*, 108824. https://doi.org/10.1016/j.ijpe.2023.108824

Abbate, S., Centobelli, P., Cerchione, R., Oropallo, E., & Riccio, E. (2023). Blockchain technology for embracing healthcare 4.0. *IEEE Transactions on Engineering Management*, *70*(8), 2998–3009. https://doi.org/10.1109/TEM.2022.3212007

Aboelmaged, M. (2018). Direct and indirect effects of eco-innovation, environmental orientation and supplier collaboration on hotel performance: An empirical study. *Journal of Cleaner Production*, *184*, 537–549. https://doi.org/10.1016/j.jclepro.2018.02.192

Aguilera-Caracuel, J., & Ortiz-de-Mandojana, N. (2013). Green innovation and financial performance: An institution approach. *Organisation & Environment*, *26*(4), 365–385. https://doi.org/10.1177/1086026613507931

Amores-Salvadó, J., De Castro, G. M., & Navas-López, J. E. (2014). Green corporate image: Moderating the connection between environmental product innovation and firm performance. *Journal of Cleaner Production*, *83*, 356–365. https://doi.org/10.1016/j.jclepro.2014.07.059

Appiah, L. O. (2019). Sustainability in supply chain management: The role of partner collaboration and power. *International Journal of Management and Sustainability*, *8*(4), 215–232. https://doi.org/10.18488/journal.11.2019.84.215.232

Appiah, L. O. (2023). Stakeholder engagement for green process innovation: Exploring the link and boundary conditions. *Operations and Supply Chain Management*, *16*(2), 153–163. https://doi.org/10.31387/oscm0530380

Appiah, L. O. (2024). Does proactive boundary-spanning search drive green innovation? Exploring the significance of green dynamic capabilities and analytics capabilities. *Corporate Social Responsibility and Environmental Management*, *1–11*. https://doi.org/10.1002/csr.2703

Appiah, L. O., & Abul- Majeed, S. (2021). Does buyer power contribute to environmental sustainability performance in supply chains? *International Journal of Sustainable Development & World Policy*, *10*(1), 38–50. https://doi.org/10.18488/journal.26.2021.101.38.50

Appiah, L. O., & Obey, V. Q. (2023). Social capital, joint knowledge creation and relationship performance in buyer-supplier relationships. *Supply Chain Forum: An International Journal*, *24*(2), 217–232. https://doi.org/10.1080/16258312.2023.2183709

Aragón-Correa, J. A., & Sharma, S. (2003). A contingent resource-based view of proactive corporate environmental strategy. *Academy of*

Management Review, *28*(1), 71–88. https://doi.org/10.5465/amr.2003.8925233

Awan, U., Nauman, S., & Sroufe, R. (2021). Exploring the effect of buyer engagement on green product innovation: Empirical evidence from manufacturers. *Business Strategy and the Environment*, *30*(1), 463–477. https://doi.org/10.1002/bse.2631

Ayuso, S., Rodriguez, M. A., Garcia-Castro, R., & Arino, M. A. (2011). Does stakeholder engagement promote sustainable innovation orientation ? *Industrial Management and Data Systems*, *111*(9), 1399–1417. https://doi.org/10.1108/02635571111182764

Borah, P. S., Dogbe, C., Pomegbe, W. S. K., Bamfo, B., & Hornuvo, K. L. (2023). Green market orientation, green innovation capability, green knowledge acquisition and green brand positioning as determinants of new product success. *European Journal of Innovation Management*, *26*(23), 364–385. https://doi.org/10.1108/EJIM-09-2020-0345

Boso, N., Oghazi, P., & Hultman, M. (2017). International entrepreneurial orientation and regional expansion. *Entrepreneurship and Regional Development*, *29*(1–2), 4–26. https://doi.org/10.1080/08985626.2016.1255430

Brandon-Jones, E., Squire, B., Autry, C. W., & Petersen, K. J. (2014). A contingent resource-based perspective of supply chain resilience and robustness. *Journal of Supply Chain Management*, *50*(3), 55–73. https://doi.org/10.1111/jscm.12050

Chan, H. K., Yee, R. W. Y., Dai, J., & Lim, M. K. (2016). The moderating effect of environmental dynamism on green product innovation and performance. *International Journal of Production Economics*, *181*, 384–391. https://doi.org/10.1016/j.ijpe.2015.12.006

Chang, C. (2011). The influence of corporate environmental ethics on competitive advantage: The mediation role of green innovation. *Journal of Business Ethics*, *104*, 361–370. https://doi.org/10.1007/s10551-011-0914-x

Chang, C. H. (2019). Do green motives influence green product innovation? The mediating role of green value co-creation. *Corporate Social Responsibility and Environmental Management*, *26*(2), 330–340. https://doi.org/10.1002/csr.1685

Chen, J.-S., Tsou, H. T., & Huang, A. Y.-H. (2009). Service delivery innovation. *Journal of Service Research*, *12*(1), 36–55. https://doi.org/10.1177/1094670509338619

Chen, Y. S., Lai, S. B., & Wen, C. T. (2006). The influence of green innovation performance on corporate advantage in Taiwan. *Journal of Business Ethics*, *67*(4), 331–339. https://doi.org/10.1007/s10551-006-9025-5

Cheng, C. C. J. (2018). Sustainability orientation, green supplier involvement, and green innovation oerformance: Evidence from diversifying green entrants. *Journal of Business Ethics*, *161*, 393–414. https://doi.org/10.1007/s10551-018-3946-7

Chu, Z., Xu, J., Lai, F., & Collins, B. J. (2018). Institutional theory and environmental pressures: The moderating effect of market uncertainty on innovation and firm performance. *IEEE Transactions on Engineering Management*, *65*(3), 392–403. https://doi.org/10.1109/TEM.2018.2794453

Costa, J., & Matias, J. C. O. (2020). Open innovation 4.0 as an enhancer of sustainable innovation ecosystems. *Sustainability (Switzerland)*, *12*(19), 8112. https://doi.org/10.3390/su12198112

Danso, A., Adomako, S., Lartey, T., Amankwah-Amoah, J., & Owusu-Yirenkyi, D. (2019). Stakeholder integration, environmental sustainability orientation and financial performance. *Journal of Business Research*, *119*, 652–662. https://doi.org/10.1016/j.jbusres.2019.02.038

Dobni, C. B. (2010). The relationship between an innovation orientation and competitive strategy. *International Journal of Innovation Management*, *14*(2), 331–357. https://doi.org/10.1142/S1363919610002660

Duque-Grisales, E., Aguilera-Caracuel, J., Guerrero-Villegas, J., & García-Sánchez, E. (2020). Does green innovation affect the financial performance of Multilatinas? The moderating role of ISO 14001 and R&D investment. *Business Strategy and the Environment*, *29*(8), 3286–3302. https://doi.org/10.1002/bse.2572

Essuman, D., Aku, P., Ataburo, H., Asiedu-appiah, F., & Boso, N. (2022). Linking resource slack to operational resilience: Integration of resource-based and attention-based perspectives. *International Journal of Production Economics*, *254*, 108652. https://doi.org/10.1016/j.ijpe.2022.108652

Essuman, D., Ataburo, H., Boso, N., Anin, E. K., & Appiah, L. O. (2023). In search of operational resilience: How and when improvisation matters. *Journal of Business Logistics*, *1–23*, 300–322. https://doi.org/10.1111/jbl.12343

Farooq, R., Vij, S., & Kaur, J. (2021). Innovation orientation and its relationship with business performance: moderating role of firm size. *Measuring Business Excellence*, *25*(3), 328–345. https://doi.org/10.1108/MBE-08-2020-0117

Fatoki, O. (2021). Environmental orientation and green competitive advantage of hospitality firms in South Africa: Mediating effect of green innovation. *Journal of Open Innovation: Technology, Market and Complexity*, *7*, 223. https://doi.org/10.3390/joitmc7040223

Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement Error. *American Marketing Association*, *18*(1), 39–50.

Ghana Statistical Service. (2016). Summary report: Integrated business establishment survey. *Ghana Statistical Service*, 1–136. https://statsghana.gov.gh/gssmain/fileUpload/pressrelease/SUMMARYREPORT_FINAL_FINAL_24-5-16.pdf

Ghassim, B., & Bogers, M. (2019). Linking stakeholder engagement to profitability through sustainability-oriented innovation: A quantitative study of the minerals industry. *Journal of Cleaner Production*, *224*, 905–919. https://doi.org/10.1016/j.jclepro.2019.03.226

Habib, M. A., Bao, Y., & Ilmudeen, A. (2020). The impact of green entrepreneurial orientation, market orientation and green supply chain management practices on sustainable firm performance. *Cogent Business and Management*, *7*(1), 1743616. https://doi.org/10.1080/23311975.2020.1743616

Hair, J. F. J., Black, C. W., Babin, J. B., & Anderson, E. R. (2014). *Multivariate data analysis* (7th ed.). Pearson Education.

Hart, S. L. (1995). A natural resource-based view of the firm. *Academy of Management Review*, *20*(4), 986–1014. https://doi.org/10.2307/258963

Hart, S. L., & Dowell, G. (2011). A natural-resource-based view of the firm: Fifteen years after. *Journal of Management*, *37*(5), 1464–1479. https://doi.org/10.1177/0149206310390219

Hayes, A. F., & Rockwood, N. J. (2020). Conditional process analysis: Concepts, computation, and advances in the modeling of the contingencies of mechanisms. *American Behavioral Scientist*, *64*(1), 19–54. https://doi.org/10.1177/0002764219859633

Hermundsdottir, F., & Aspelund, A. (2020). Sustainability innovations and firm competitiveness: A review. *Journal of Cleaner Production*, *280*, 124715. https://doi.org/10.1016/j.jclepro.2020.124715

Hofman, P. S., Blome, C., Subramanian, N., & Schleper, M. C. (2020). Supply chain collaboration and eco-innovations: An institutional perspective from China. *Business Strategy and the Environment*, *1–21*, 2734–2754. https://doi.org/10.1002/bse.2532

Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: An integration and empirical examination. *Journal of Marketing*, *62*(3), 42–54. https://doi.org/10.1177/002224299806200303

Ionescu, A., & Ionescu, C. (2015). The relationship between innovation orientation and organisation's performance in Romania. *Romanian Journal of Economics*, *40*(49), 299–312.

Kawai, N., Strange, R., & Zucchella, A. (2018). Stakeholder pressures, EMS implementation, and green innovation in MNC overseas subsidiaries. *International Business Review*, *27*(5), 933–946. https://doi.org/10.1016/j.ibusrev.2018.02.004

Khan, S. J., Parida, V., & Papa, A. (2021). Past, present, and future of green product innovation. *Business Strategy and the Environment*, *21*, 4081–4106. https://doi.org/10.1002/bse.2858

Leal-rodríguez, A. L., Ariza-montes, A. J., & Morales-fernández, E. (2017). Green innovation, indeed a cornerstone in linking market requests and business performance. Evidence from the Spanish automotive components industry. *Technological Forecasting & Social Change*, *129*, 185–193. https://doi.org/10.1016/j.techfore.2017.07.021

Leyva-de la Hiz, D. I., Ferron-Vilchez, V., & Aragon-Correa, J. A. (2019). Do firms' slack resources influence the relationship between focused environmental innovations and financial performance? More is not always better. *Journal of Business Ethics*, *159*(4), 1215–1227. https://doi.org/10.1007/s10551-017-3772-3

Li, Y. (2014). Environmental innovation practices and performance: Moderating effect of resource commitment. *Journal of Cleaner Production*, *66*, 450–458. https://doi.org/10.1016/j.jclepro.2013.11.044

Lin, W., Cheah, J., Azali, M., Ann, J., & Yip, N. (2019). Does firm size matter ? Evidence on the impact of the green innovation strategy on corporate fi nancial performance in the automotive sector. *Journal of Cleaner Production*, *229*, 974–988. https://doi.org/10.1016/j.jclepro.2019.04.214

Lisi, W., Zhu, R., & Yuan, C. (2020). Embracing green innovation via green supply chain learning: The moderating role of green technology turbulence. *Sustainable Development*, *28*(1), 155–168. https://doi.org/10.1002/sd.1979

Llerena, D. (2011). Green consumer behaviour: An experimental. *Business Strategy and the Environment*, *20*, 408–420.

Meirun, T., Mihardjo, L. W., Haseeb, M., Khan, S. A. R., & Jermsittiparsert, K. (2021). The dynamics effect of green technology innovation on economic growth and CO_2 emission in Singapore: New evidence from bootstrap ARDL approach. *Environmental Science and Pollution Research*, *28*(4), 4184–4194. https://doi.org/10.1007/s11356-020-10760-w

Melander, L. (2017). Achieving sustainable development by collaborating in green product innovation. *Business Strategy and the Environment*., *26*, 1095–1109. https://doi.org/10.1002/bse.1970

Ofori-Dankwa, J., & Julian, S. D. (2013). Dynamism, capital structure, and performance in a sub-saharan economy: Extending the institutional difference hypothesis. *Organization Science*, *24*(5), 1422–1438. https://doi.org/10.1287/orsc.1120.0789

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Podsakoff, P. M., Mackenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, *63*, 539–569. https://doi.org/10.1146/annurev-psych-120710-100452

Prieto-Sandoval, V., & Torres-Guevara, L. E. (2022). Green marketing innovation: Opportunities from an environmental education analysis in young consumers. *Journal of Cleaner Production*, *363*, 132509. https://doi.org/10.1016/j.jclepro.2022.132509

Qiao, J., Li, S., & Capaldo, A. (2022). Green supply chain management, supplier environmental commitment, and the roles of supplier perceived relationship attractiveness and justice. A moderated moderation analysis. *Business Strategy and the Environment*, *31*, 3523–3541. https://doi.org/10.1002/bse.3103

Roh, T., Noh, J., Oh, Y., & Park, K. (2022). Structural relationships of a firm' s green strategies for environmental performance: The roles of green supply chain management and green marketing innovation. *Journal of Cleaner Production*, *356*, 131877. https://doi.org/10.1016/j.jclepro.2022.131877

Sellitto, M. A., Camfield, C. G., & Buzuku, S. (2020). Green innovation and competitive advantages in a furniture industrial cluster: A survey and structural model. *Sustainable Production and Consumption*, *23*, 94–104. https://doi.org/10.1016/j.spc.2020.04.007

Seman, N. A. A., Govindan, K., Mardani, A., Zakuan, N., Mat Saman, M. Z., Hooker, R. E., & Ozkul, S. (2019). The mediating effect of green innovation on the relationship between green supply chain management and environmental performance. *Journal of Cleaner Production*, *229*, 115–127. https://doi.org/10.1016/j.jclepro.2019.03.211

Shashi, Centobelli, P., Cerchione, R., & Mittal, A. (2021). Managing sustainability in luxury industry to pursue circular economy strategies. *Business Strategy and the Environment*, *30*(1), 432–462. https://doi.org/10.1002/bse.2630

Siguaw, J. A., Simpson, P. M., & Enz, C. A. (2006). Conceptualizing innovation orientation: A framework for study and integration of innovation research. *Journal of Product Innovation Management*, *23*, 556–574. https://doi.org/10.1111/j.1540-5885.2006.00224.x

Song, M., Yang, M. X., Zeng, K. J., & Feng, W. (2020). Green knowledge sharing, stakeholder pressure, absorptive capacity, and green innovation: Evidence from Chinese manufacturing firms. *Business Strategy and the Environment*, *29*, 1517–1531. https://doi.org/10.1002/bse.2450

Tariq, A., Badir, Y., & Chonglerttham, S. (2018). Green innovation and performance: Moderation analyses from Thailand. *European Journal of Innovation Management*, *22*, 446–467. https://doi.org/10.1108/EJIM-07-2018-0148

Tong, T., & Rahman, A. A. (2022). Effect of innovation orientation of high-tech SMEs "small and mid-sized enterprises in China" on innovation performance. *Sustainability*, *14*, 1–17.

Wang, C., Zhang, X., & Teng, X. (2022). How to convert green entrepreneurial orientation into green innovation: The role of knowledge creation process and green absorptive capacity. *Business Strategy and the Environment*, *32*(4), 1260–1273. https://doi.org/10.1002/bse.3187

Wolf, M., Emerson, J., Esty, D., de Sherbinin, A., & Wendling, Z. (2022). *Environmental performance index 2022*. Yale Center for Environmental Law & Policy.

World Bank Group. (2018). Third Ghana economic update: Agriculture as an engine of growth and jobs creation. In *World Bank*. http://documents.worldbank.org/curated/en/113921519661644757/Third-Ghana-Economic-Update-agriculture-as-an-engine-of-growth-and-jobs-creation

Xie, X., Huo, J., & Zou, H. (2019). Green process innovation, green product innovation, and corporate financial performance: A content analysis method. *Journal of Business Research*, *101*, 697–706. https://doi.org/10.1016/j.jbusres.2019.01.010

Xue, M., & Boadu, F. (2019). The penetration of green innovation on firm performance: Effects of absorptive capacity and managerial environmental concern. *Sustainability*, *11*(2455), 1–24.

Yao, Q., Liu, J., Sheng, S., & Fang, H. (2019). Does eco-innovation lift firm value? The contingent role of institutions in emerging markets. *Journal of Business and Industrial Marketing*, *34*(8), 1763–1778. https://doi.org/10.1108/JBIM-06-2018-0201

Zhang, J. A., & Walton, S. (2017). Eco-innovation and business performance: The moderating effects of environmental orientation and resource commitment in green-oriented SMEs. *R and D Management*, *47*(5), E26–E39. https://doi.org/10.1111/radm.12241

Zhu, Q., & Sarkis, J. (2016). Green marketing and consumerism as social change in China: Analyzing the literature. *International Journal of Production Economics*, *181*, 289–302. https://doi.org/10.1016/j.ijpe.2016.06.006

How to cite this article: Appiah, L. O., & Essuman, D. (2024). How do firms develop and financially benefit from green product innovation in a developing country? Roles of innovation orientation and green marketing innovation. *Business Strategy and the Environment*, 1–12. https://doi.org/10.1002/bse.3864