

## GREEN INNOVATION AND FINANCIAL PERFORMANCE OF CONSUMER GOODS FIRM IN NIGERIA: MODERATING EFFECT OF ENVIRONMENTAL COSTS

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### Abstract

*The research on environmental performance is gaining much attention from academics and politics when it is associated with each country's policies regarding environmental problems. Unfortunately, the comprehensive studies to observe this case become rare, therefore this study is aimed to propose a conceptual framework on the moderating effect of environmental cost on the relationship between green innovation and financial performance. Literatures reviewed shows that there is inconsistency in the findings on the relationship between green innovation and firm performance. Environmental cost has a strong significant effect on Organisational performance and can moderate the relationship between green innovation and firm performance. The conclusion reached is that the way an organisation manages, and sustains its green innovation and environmental cost has a remarkable relationship with its performance and achievements. It is suggested that future studies to apply the proposed conceptual framework so as to find empirical evidence.*

**Keywords:** performance; green innovation; environmental cost

### Introduction

The escalating global emphasis on environmental conservation has prompted stringent regulations, compelling businesses to integrate sustainable innovation into their operations (Naseem et al., 2021; Falster et al., 2019). Consequently, green innovation (GI) has emerged as a pivotal factor in contemporary industries (Singh et al., 2020). By minimizing detrimental environmental impacts, GI optimizes corporate practices (Chen et al., 2018). The adoption of green process innovation significantly reduces pollution, thereby enhancing sustainable performance (Ai et al., 2021). The growing demand for sustainable performance has led organizations to prioritize green operations (Youssef, 2021). Moreover, green product innovation has driven businesses to develop eco-friendly products and services, ultimately influencing their sustainable performance (Saudi et al., 2019). Moreover, the recognition of green innovation's (GI) pivotal role has spurred companies to integrate environmentally conscious measures into their strategic frameworks. Scholars has underscored the benefits of embedding GI within business strategies, leveraging sustainable thinking to enhance the GI paradigm and mitigate ecological vulnerabilities (Khan & Johl, 2020). The adoption of GI strategies has refined companies' strategic orientation towards sustainability, elevating sustainable performance to a paramount objective (Wang et al., 2022). Globally, nations are collaborating to ensure environmental stewardship, with governments implementing legislation and incentivizing eco-friendly organizations.

Meanwhile, shareholders exhibit growing concern for Organisational performance, as it directly influences the management of their investments and ultimately, their returns. Investors' primary objective is wealth maximization, focusing on financial returns rather than operational intricacies. Shareholders seek to optimize their wealth through share price appreciation, which is contingent upon efficient resource allocation. Strong financial performance serves as an indicator of a healthy economy, bolstering investor confidence. Within the macroeconomic framework, financial performance reflects companies' efficacy in allocating scarce resources (Ibrahim et al., 2024). Consequently, strong performance fosters investor trust, demonstrating economic viability.

Furthermore, the collapse of prominent American corporations, such as WorldCom and Enron, has heightened investor concerns (Ibrahim et al., 2024). Globally, businesses have faced performance challenges, with Nigeria being no exception. Notably, the consumer goods sector's performance declined from 26% to 24% between 2000 and 2020 (United Nations Industrial Development Organization, 2022). In Latin America, specifically Peru, the sector's contribution to GDP decreased from 17% in 2010 to 9% in 2020. This decline was mirrored in the sector's production share, dropping from 10.6% to 5.7% over the same period (Sociedad Nacional de Industrias, 2022).

However, prior research on the green innovation-financial performance nexus has yielded conflicting findings. Some studies (i.e. Helmi & Widiastuty, 2023; Nsiah et al., 2022; Novitasari & Agustia, 2022) reveal a positive relationship, whereas others (i.e. Jayaraman et al., 2023; Osei, 2022; Pandithasekara, 2022; Wang et al., 2022) indicate a negative relationship. Notably, Fitriani (2015) found no significant association. Although moderation attempts have been made (i.e. Wang et al., 2022; Alhadid et al., 2014), but to best of the researcher's knowledge, environmental cost has not been explored as a moderating variable on the relationship between green innovation and financial performance. This study focuses on Nigerian consumer goods companies, given their unique ownership structure, where a few individuals control the majority stakes. This context offers a distinct perspective, potentially yielding divergent yet insightful results.

Based on the above background, the study proposed a conceptual review on the moderating effect of environmental cost on the relationship between green innovation and firm performance, because today research on "environmental cost" provides rich and diverse knowledge.

## **1.2 Research Objectives**

The objectives of this research paper are as follows:

1. To examine the relationship between green innovation and firm performance.
2. To examine the relationship between environmental cost and firm performance.
3. To examine the moderating role of environmental cost on the relationship between green innovation and firm performance.

## Literature Review

### 2.1 Concept of Green Innovation (GI)

The Green Innovation (GI) literature encompasses two primary perspectives. One viewpoint conceptualizes GI as an organization's inherent capabilities (Gluch et al., 2009), whereas the other defines it as the implementation of environmentally conscious practices (Lin & Ho, 2008; Ho et al., 2009). Alternatively, GI is referred to as eco-innovation or environmental innovation, involving the development of novel or enhanced technologies, procedures, and products that mitigate environmental harm (Marchi, 2012). From an Organisational standpoint, GI entails innovations in software, hardware, or management practices focused on sustainable operations, products, and management (Song & Yu, 2018). GI integrates managerial and technological advancements to synergistically enhance environmental and Organisational performance, yielding a competitive advantage (Rennings, 2000). Furthermore, GI comprises distinct systems, products, processes, and practices that provide ecological benefits and promote corporate sustainability (Xie et al., 2019).

#### 2.1.1 Measures of Green Innovation (GI)

Through the implementation of Green Innovation (GI), organizations transform their products, structures, processes, and management practices from conventional to innovative, fostering business growth while ensuring environmental sustainability (Mama et al., 2018). Previous research has categorized GI into distinct subsets (Tang et al., 2018; Xie et al., 2019; Xu et al., 2022), specifically:

1. Green Product Innovation (GPdI)
2. Green Process Innovation (GPcI)
3. Green Management Innovation (GMI)

### 2.2 Concept of Financial Performance

Performance encompasses two distinct dimensions: efficiency and effectiveness. Efficiency pertains to the optimal allocation of resources, whereas effectiveness gauges the attainment of predetermined objectives (Dahiru et al., 2016). In the context of management science, performance serves as a metric for evaluating employee productivity (Osman, 2019). Moreover, Organisational performance is a critical indicator of strategic objective achievement and competitive positioning. Financial performance, a vital aspect of Organisational success, is defined as the ability to optimize profit generation from available resources and assets (Olusola et al., 2022). It encompasses a comprehensive assessment of an organization's financial robustness over a specified period. Financial performance evaluation scrutinizes an organization's efficiency and effectiveness in achieving profit maximization goals and safeguarding shareholder financial interests.

### 2.2.1 Measures of Financial Performance

According to Kaplan (2012), key performance indicators (KPIs) can be categorized into monetary (financial) and non-monetary (non-financial) metrics. Financial KPIs, which contribute to financial success, include: Financial indicators:

- Net profit margin
- Liquidity
- Asset turnover
- Operational cash flow
- Leverage
- Profit/loss
- Solvency
- Equity
- Revenue growth
- Gross profit margin
- Accounts receivable turnover
- Inventory turnover

These financial performance indicators are typically derived from income statements and balance sheets, and may also track sales growth (by channel, product, or customer segment) or expense categories.

Non-financial indicators encompass measures related to:

- Customer relationships
- Employee performance
- Operational efficiency
- Quality control
- Cycle-time management
- Supply chain optimization

Also, researchers have employed profitability-based accounting indicators, such as return on assets (ROA) and return on equity (ROE), to assess financial performance (Olusola et al., 2022).

### 2.3 Concept of Environmental Cost

Environmental costs encompass the identification and quantification of expenditures related to environmental goods and services, guiding environmental management decisions (Raymond et al., 2016). These costs comprise expenses associated with developing environmental initiatives, identifying environmental risks, repairing environmental damage, and preventing environmental harm. Environmental costing, a fundamental principle of environmental accounting, enables businesses to achieve sustainable development, foster positive social relationships, and preserve the environment (Okafor, 2018). This accounting approach facilitates determining environmental protection costs, identifying benefits, and measuring and communicating results effectively. Moreover, environmental accounting is a comprehensive discipline that provides internal and external reports supplying valuable environmental information (Moussa et al., 2015). This information enables informed decision-making among stakeholders, influencing pricing strategies, overhead control, and capital

budgeting. By adopting environmental accounting practices, businesses can effectively manage environmental costs, promote sustainability, and ensure long-term viability.

#### **2.4 Green Innovation and Firm Performance**

The literature review reveals inconsistent findings regarding the relationship between green innovation and firm performance. Several studies (i.e. Helmi & Widiastuty, 2023; Nsiah et al., 2022; Novitasari & Agustia, 2022; Maya & Tarigan, 2022; Wang et al., 2021; Asadi et al., 2020; Zhang et al., 2020a, 2020b, 2019; Xie et al., 2019; Tang et al., 2018; Ma et al., 2018; Zhang & Walton, 2017; Tang et al., 2017) indicate a positive significant relationship. Conversely, other studies (i.e. Jayaraman et al., 2023; Osei, 2022; Pandithasekara, 2022; Wang et al., 2022; Chandra et al., 2021; Rehman et al., 2021; Singh et al., 2020; Khan & Johl, 2020; Saudi et al., 2019) reveal a negative significant relationship. Notably, Fitriani (2015) found no significant relationship. To address these inconsistencies, researchers have attempted to moderate the relationship using various independent variables and firm performance (Wang et al., 2022; Alhadid et al., 2014). However, none of these studies have explored environmental cost as a moderating variable, highlighting a significant research gap. Therefore, this study proposed the following hypothesis:

H1: Green product innovation has effect on firm performance

H2: Green process innovation has effect on firm performance

#### **2.5 Moderating Role of Environmental Cost**

Existing literature reveals a significant link between environmental cost and financial performance, as evidenced by studies such as Lawrence and Bernard (2023), Ilelaboye and Alade (2022), Ofurum and Iwunna (2022), Okeke et al. (2021), Oraka (2021), Okore (2021), Chiamogu and Okoye (2020), Nwaimo (2020), Nwaiwu and Oluka (2018), and Okafor (2018). Moreover, research by Wang et al. (2023) and Ifada and Saleh (2022) demonstrates the effectiveness of environmental cost as a moderating variable, highlighting its potential to influence relationships between key business metrics. Thus, based on the abovementioned arguments, this study proposed the following hypotheses:

H3: Environmental Cost has impact on firm performance

H4: Environmental Cost moderate the relationship between green innovation and firm performance

#### **2.6 Empirical Review**

Li et al. (2023) examined the relationship between green innovation and sustainable performance, mediated by green product innovation and moderated by employee green behaviour. Using resource-based theory, they investigated the impact of green process innovation, GI strategy, and green action innovation on sustainable performance. Their study, based on 411 employees in Pakistan's manufacturing sector, employed structural equation modelling and partial least squares regression. The findings revealed that employee green initiatives enhance sustainable performance through eco-friendly products and moderate the relationship between green product innovation and sustainable performance.

Helmi (2023) provided empirical evidence on the effects of green process innovation and green product innovation on firm performance. Focusing on manufacturing firms listed on the Indonesia

Stock Exchange (IDX) from 2016 to 2020, the study utilized purposive sampling, yielding 103 firm-years. Multiple linear analysis with E-views version 12 was employed. Green product innovation and green process innovation served as independent variables, firm performance as the dependent variable, and firm size and age as control variables. The results showed that green product innovation positively affects firm performance at  $t+1$  and  $t+2$ , while green process innovation has no significant impact.

Pandithasekara (2022) investigated the impact of green innovation practices on Organisational performance in Sri Lanka's apparel industry. The study revealed that green innovation drives Organisational performance, which can be explained by various factors, including financial performance, competitive advantage, environmental performance, operational performance, talent development, and Organisational culture. The findings suggest that a comprehensive analysis and implementation of green innovation strategies at the governmental level are crucial for achieving sustainability. Furthermore, strengthening supplier-based manufacturing efforts would enable producers to adopt environmentally friendly practices, fostering economic growth while harmonizing with the environment. Therefore, it is recommended that green innovation initiatives receive government-level support and that supplier-based manufacturing networks be developed, integrating sustainability practices into Organisational culture. The study contributes to the understanding of green innovation's role in enhancing Organisational performance and promotes sustainable development in the apparel industry.

Yuniarti et al. (2022) investigated the impact of green innovation on firm value in the mining industry, with financial performance as a mediating variable. Their study sampled mining companies participating in Indonesia's Corporate Performance Rating Assessment (PROPER) and listed on the Indonesia Stock Exchange from 2012 to 2018. Financial performance was measured by return on assets (ROA), while firm value was assessed using Tobin's Q. The results revealed a positive effect of green innovation on firm value, with financial performance mediating this relationship. Specifically, green innovation enhances financial performance, which in turn increases firm value. The study provides novel insights into the direct and indirect effects of green innovation on firm value and financial performance, contributing to a comprehensive understanding of the complex relationships between these variables. The research underscores the importance of green innovation in enhancing firm value and financial performance in the mining industry.

Wang et al. (2021) examined the impact of stakeholders' views on green innovation (GI) practices and their subsequent effects on environmental and Organisational performance (OP), considering the moderating role of innovation orientation. Employing a quantitative approach, they collected 515 responses through convenient random sampling from manufacturing and services firms in Pakistan's Punjab province. The data, gathered via a closed-ended questionnaire, was analysed using partial least squares structural equation modelling. The findings revealed a positive and significant relationship between stakeholders' views and GI practices. Moreover, GI practices were significantly associated with environmental and Organisational performance. Notably, innovation orientation had a negative but statistically significant moderating effect. This study contributes to the understanding of

stakeholder influence on GI adoption and its performance outcomes, offering valuable decision-making implications for firms seeking to integrate stakeholders' perspectives into their sustainability strategies.

Siswoyo et al. (2020) investigated the competitive advantage derived from environmental management and green innovation, a topic widely discussed in various publications. Employing a mixed-methods approach, they combined a questionnaire distributed to 110 respondents with in-depth interviews of three BUMDES management informants. The results revealed a positive and significant relationship between environmental management, green innovation, and competitive advantage, as well as firm performance. This study's findings have important implications for policymakers and BUMDES managers, providing valuable insights to inform the development of environmental management and green innovation strategies to achieve sustainable competitiveness.

Tang et al., (2017) found that green process innovation has a positive significant effect on the performance of manufacturing firms in China. Nsiah et al., (2022) indicated that green process innovation had a significant negative association with enterprise financial performance of 64 manufacturing firms in Johannesburg from 2011 up to 2018. Novitasari and Agustia (2022) found that green innovation has a positive effect on firm performance of 369 firm in Indonesia for the 2010–2018 period.

## 2.7 Propose Conceptual Framework

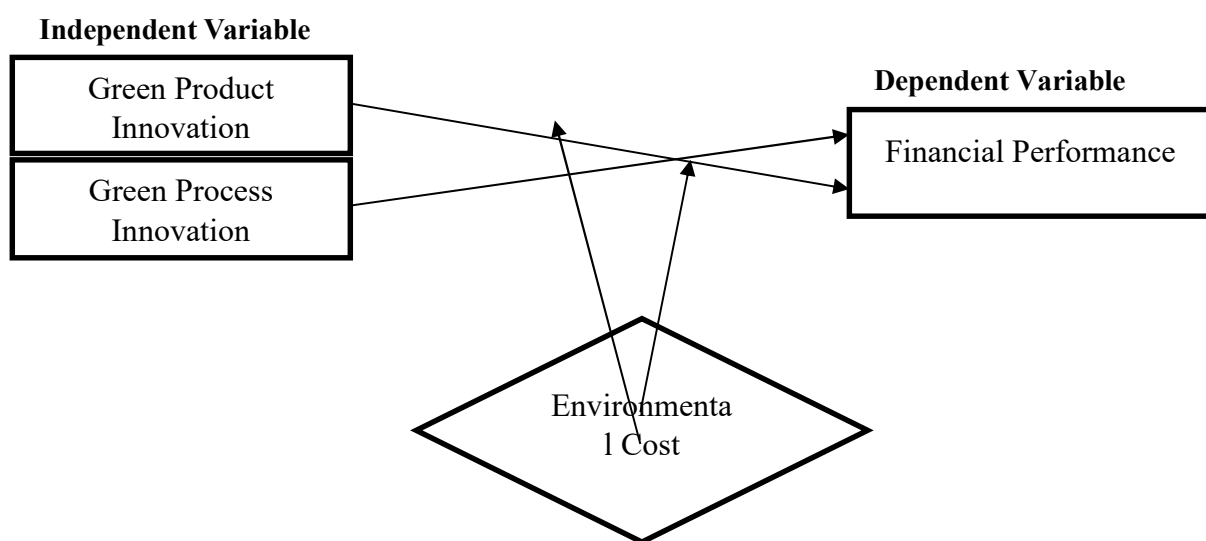


Figure 1: Conceptual Framework

## 2.8 Theoretical Framework

### 2.8.1 Resource-Based View

The resource-based view (RBV) theory, initially formulated by Penrose (1959) and later developed by Wernerfelt (1984), posits that a firm's resources, including assets and weaknesses, underpin its competitive advantage. Wernerfelt defines resources as "semi-permanent" tangible and intangible assets enabling firms to gain a competitive edge. Barney (1991) expands on this concept, arguing that firms can sustainably leverage internal strengths to capitalize on external opportunities and mitigate

risks. In the context of green innovation and environmental cost, RBV theory suggests these intangible resources confer a unique competitive advantage. Green innovation and environmental cost can be viewed as extraordinary intangible resources influencing Organisational performance (Lo, 2012). This study examines the impact of green innovation and environmental cost on Organisational performance through the lens of RBV theory, building on previous research indicating specific environmental costs and green innovation can be considered assets enhancing performance and competitiveness (Li et al., 2023; Egbadju & Elaigwu, 2023).

### 3.0 Conclusions and Recommendations

In conclusion, the literature review highlights the complex/inconsistent relationship between green innovation, environmental cost, and firm performance, revealing inconsistent findings on the link between green innovation and firm performance. However, environmental cost significantly impacts Organisational performance and can moderate the relationship between financial leverage and firm performance. Effective management and sustainability of green innovation and environmental cost are crucial for a company's success. Notably, the study concludes that environmental cost can strengthen the relationship between green innovation and performance of consumer goods firms in Nigeria. Consequently, managers of consumer goods firms are advised to consider environmental cost in their operational processes, as it affects performance and green innovation. Future research should apply the proposed conceptual framework to provide empirical evidence and further explore this relationship, shedding more light on the interplay between green innovation, environmental cost, and firm performance.

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