ISSN: 2579-0609

GREEN PACKAGING AND SUPPLY CHAIN COMPETITIVENESS OF ELECTRONICS DISTRIBUTION COMPANIES IN SOUTH-EAST NIGERIA

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Abstract

This study investigated the relationship between green packaging and supply chain competitiveness of electronics distribution companies in South-East Nigeria. The study was anchored on transaction cost economies theory. The study adopted a, explanatory research approach. The population of the study consisted one hundred and fifteen (115) electronics distribution companies. The Taro Yamane's formula was used to derive a sample of eighty-one (81) companies. One logistics manager from each company was drawn from the 81 companies to provide primary data for the study. A structured self-administered questionnaire was used to collect primary data. The Cronbach's Alpha test was used to ascertain the consistency of the constructs in the questionnaire, with a threshold of 0.7. The Pearson Product Moment Correlation was employed to determine the degree and direction of relationship between the variables. The statistical package for social sciences (SPSS) version 25.0 aided the tests. Results from the analysis showed that green packaging significantly relates to supply chain competitiveness (innovativeness, cost reduction, optimal resource utilization). Thus, the study concluded that green packaging contribute to innovativeness, cost reduction, and optimal resource utilization of electronics distribution companies in South-East Nigeria; and recommends that management of electronics distribution companies in South-East Nigeria should effectively implement green packaging, if they seek to improve the competitiveness of their supply chain. Keywords: cost reduction, green packaging, innovativeness, optimal resource utilization, supply chain competitiveness

Introduction

Every day, millions of packaged items are shipped throughout the world. Each of these items generates waste and many conventional packaging materials cannot be recycled. With the large number of companies transporting goods on a daily basis from factories to retailers, a lot of waste is generated. Wasteful plastics, cardboard, Styrofoam and paper used in packaging are found on streets, drainages and waterways. This has given rise to calls for supply chain partners to switch from conventional packaging to green packaging for the sake of the environment.

Also, the escalated importance of environmental protection has resulted in organizations and individuals preferring to go green (Wandosell et al., 2021) by shifting away from nonbiodegradable waste that harms the ecosystem (Welivita et al., 2015). The growing concern for environmental protection has increased demand for sustainable packaging as a fruitful alternative to packaging that ends up in landfills as waste (Huang, 2017).

Also, van den Elzen (2016) stated that using green packaging is becoming a requirement for competitiveness; as companies that adopt green packaging report positive brand image and reputation, cost savings and better environmental footprints amongst other benefits. It is against this backdrop that this paper examined green packaging and supply chain competitiveness of electronics distribution companies operating in Rivers State as a survey study.

Theoretical Framework

This paper was predicated on transaction cost economics theory which focuses on how much effort and cost are required for two entities (buyer and seller) to complete an economic exchange (Williamson, 2016). Suppliers and buyers seek to minimize cost of transactions (Touboulic &

Walker, 2015). Xingxing (2012) clarifies that transaction cost theory refers to the idea of cost of providing for goods or services if it was purchased from external vendors; rather than made or acquired internally.

Three concepts underpin the theory: transaction costs, asset specificity and asymmetrical information distribution. Transaction costs comprised search, bargaining, decision, policing and enforcement costs. Asset specificity refers to the relative lack of transferability of soft and assets intended for use in a given transaction to other uses.

There are at least five forms of exchange hazards: expropriation, appropriability, measurementrelated, inter-temporal and institutional weakness hazards (Williamson 2016). Some of these hazards have been investigated using the case study approach to understand supply chain relationships that require suppliers to invest in design for environment and environmental management system practices (Sauer & Seuring, 2018). The current study finds transaction cost economics theory adequate in explaining behaviour of firms with regards to green packaging.

Concept of Green Packaging

Green packaging – also known as environmentally friendly packaging, eco-friendly packaging, recyclable packaging, sustainable packaging, eco-green packaging – is concerned with packaging items with materials that are bio-degradable (Wandosell et al., 2021). Green packaging considers the environment by using energy efficient and biodegradable materials. The level of environmental awareness today has resulted in organizations and consumers that prefer recyclable, reusable and degradable packaging (Oloyede & Lignou, 2021; Olsen et al., 2014).

Apart from using biodegradable and recyclable packaging to protect the environment, green packaging also has lower packaging content (packaging optimization) and uses renewable energy. Green packaging is an effective strategy for achieving environmental sustainability. Companies that switch from conventional packaging to green packaging intend to meet functional and economic needs of present generations without compromising the ability of future generations to meet their own needs.

Supply Chain Competitiveness

To, understand the concept of supply chain competitiveness, it is necessary to first understand the concept of competitiveness. Cho (1998, as cited in Isoghom & Ajah, 2018) states that competitiveness is the relative strength of an entity compared to others. Competitiveness supply chain context, is the advantage one supply chain holds over others (Febransyah & Camelia-Goni, 2020). Supply chain competitiveness is also the ability of a supply chain to deliver value to customer and confer competitive advantage on member firms. It refers to ability of a supply chain as a whole to gain competitive advantage as compared to competing supply chains (Rajagopal, 2010; Verma & Seth, 2011).

Supply chain competitiveness has received growing attention from operations and supply chain management scholars (Febransyah & Camelia-Goni 2020). The preparation of a supply chain for superior value increase chances of achieving competitive advantage. Supply chain competitiveness is a key tool for gaining competitive advantage. Supply chain competitiveness is necessary for firms to be the strategic focus, due to speedy technological innovations, globalization, and widely used information technology.

The strategic focus of supply chain requires forming alliances, reengineering, renovating, or refining operations and developing strategies (Isoghom et al., 2022). Supply chain competitiveness requires the integration, and coordination of different components of a supply chain to make it a joint alliance for unified purpose.

Martínez-Olvera (2008) studied supply chain competitiveness in a manufacturing organization and regarded supply chain competitiveness as a holistic concept covering the performance of the entire supply chain rather than that of a single company in the supply chain. This suggests that supply chain competitiveness can be measured using various metrics. In this study, supply chain competitiveness is proxied by innovativeness, cost reduction and optimal resource utilization.

Innovativeness

Innovativeness of a firm refers to openness and capacity to introduce innovation (Isoghom et al., 2022). It is the capability to generate new products, processes, or ideas that confer competitive advantage. By implication, it is receptivity to change and willingness to face new challenges. Innovativeness is a dynamic capability of strategic importance that could be leveraged to succeed in the business environment.

Innovative firms are less resistant to change and more open to creating and leveraging niches. Innovativeness is pivotal to augmenting quality and performance. Customers are value co-creators and a source of innovation because they are not only users of services but also value co-creators (Huarng et al., 2018; Cui & Wu, 2016).

Innovativeness infers a willingness to give up old habits and attempt experimental ideas by seeking new opportunities rather than relying solely on current ones. Innovativeness often strengthen competitive position of organizations in markets where customer demands change quickly, and differentiation is limited. Innovative firms are better at satisfying customers, responding to uncertainty, and surviving volatile demand (Rhee et al., 2010).

Cost reduction

Koufteros et al. (2007) describe cost as the sum of all expenses incurred in a firm's operations. Hamid (2021) describe cost as the expenses incurred to complete a specific activity or operation within a supply chain. McWatters et al. (2001) states that low production costs has become one of the primary ways that organizations compete in a global economy, hence, cost reduction must continually be in the minds of managers of organization. Building a strategy based on reducing overall costs entails considering: reducing inventories, maximizing resource utilization and eliminating non-value adding.

Cost reduction is the process of cutting down costs incurred by an organization. According to Isoghom et al. (2022), cost reduction starts with an assumption that current cost levels are too high despite the fact that cost control may be good and the organization is experiencing high efficiency levels. Cost reduction is important to firms because it regulates unwanted expenses and bring about an increase in competitiveness.

Cost reduction strategies can decrease functional costs while growing productivity, permitting for planned rearrangement of resources. These cost reduction strategies deliver extra assistances that swell throughout the business by eradicating waste, hastening processes, and exploiting resources effectively (Ngumi, 2014). Thus, cost reduction is key to operational efficiency.

Optimal resource utilization

Resource according to Zheng et al. (2022) is time and other productive inputs utilized productively. Guo et al. (2020) described resource utilization as a key performance indicator that allows managers to foresee resource availability across multiple categories. Resource utilization is key to supply chain competitiveness. It explains how resources are employed for productive activities.

Hence, resource utilization focuses on how the firm produces goods and services, using available resources and leveraging economies of scale and market demand. According to Syverson (2011), resource utilization is efficiency in the use of inputs such as land, labour, capital and management employed in a firm's operations. It is the process of combing man, machines and methods optimally with a view to ensuring quality goods and services for the market.

Zheng et al. (2022) asserts that resource utilization is a vital area of project and portfolio management that sustain growth, increase profits, improve productivity and enhance the bottom line. Resource utilization is the simplest means of measuring efficiency and tracking daily productivity of employees (Guo et al., 2020; Tokman & Beitelspacher, 2011). In supply chain management contexts, resource utilization paradigm focuses on making productive use of assets to maximize customer service, reduce lead time and optimize inventory levels (Pan et al., 2017).

Green Packaging and Supply Chain Competitiveness

Ahmed (2022), examined influence of green purchasing and green packaging on sustainability and operational performance in e-commerce. Finding from the study reveal that green purchasing has no significant impact on overall performance; however, a weak positive impact of green packaging on sustainability of a business was observed.

Similarly, Maziriri (2020), assessed impact of green packaging and green advertising on competitive advantage and business performance of manufacturing Small and Medium-sized Enterprises (SMEs) in South Africa. The result of the investigation revealed that green packaging and green advertising had a positive influence on competitive advantage and business performance.

Also, Anucha et al. (2018) explored the relationship between green packaging and environmental sustainability in Nigeria; and found that there is positive significant relationship between green packaging and environmental sustainability. A positive significant relationship was equally found between packaging optimization and environmental sustainability.

- Ho_{1:} There is no significant relationship between green packaging and innovativeness of electronics distribution companies in South-East Nigeria.
- Ho_{2:} There is no significant relationship between green packaging and cost reduction of electronics distribution companies in South-East Nigeria.
- Ho_{3:} There is no significant relationship between green packaging and optimal resource utilization of electronics distribution companies in South-East Nigeria.



Fig 1: Conceptual framework of relationship between green packaging and supply chain competitiveness

Methodology

This study adopted an explanatory research design to investigate the relationship between green packaging and supply chain competitiveness of electronics distribution companies in South-East Nigeria. The population of the study consist one hundred and fifteen (115) electronics distribution companies as obtained from the federal ministry of commerce and industry. The Taro Yamane formula was used to derive a sample size of eighty- nine (89) distribution companies. One (1) logistics manager from each of companies was selected as respondents for the study. Primary data was collected using structured questionnaire. Cronbach's Alpha reliability test was conducted to ascertain the reliability of the instrument using a threshold of 0.70 established by Nunally (1978). The Pearson Product Moment Correlation analysis was used to test the three hypotheses stated in the study with a critical value of 0.01. All analysis were done with the aid of the Statistical package for Social Sciences (SPSS) version 25.0.

Variables	No. of Items	Alpha coefficients
Green Packaging	3	0.813
Innovativeness	3	0.779
Cost Reduction	3	0.904
Optimal Resource Utilization	3	0.855

Table 1 Cronbach Reliability Analysis

Source: SPSS Output from Survey Research

The results in Table 1 reveals that all the variables in the study produced high Cronbach's Alpha coefficients indicating that there is inter item consistency among the variables in the study. This means that, if this study is conducted again in a similar condition the results will be similar to the results of the study.

		Green Packaging	Innovativeness
Green Packaging	Pearson Correlation	1	$.700^{**}$
	Sig. (2-tailed)		.000
	Ν	81	81
Innovativeness	Pearson Correlation	$.700^{**}$	1
	Sig. (2-tailed)	.000	
	N	81	81

Results and Interpretation Table 2: Correlation test for green packaging and Innovativeness

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2 reveals a correlation coefficient of 0.700** between green packaging and innovativeness. This indicates a strong positive relationship between green packaging and innovativeness. More so, the probability value (0.000) is less than the critical value (0.05), this shows that the relationship between green packaging and innovativeness is statistically significant. This implies that electronics distribution companies in South-East Nigeria can leverage green packaging to achieve innovativeness. Based on this, we reject the null hypothesis that there is no significant relationship between green packaging and innovativeness of electronics distribution companies in South-East Nigeria.

Table 3: Correlation test for gree	n packaging and Cost Reduction
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		Green Packaging	Cost Reduction
Green Packaging	Pearson Correlation	1	.757**
	Sig. (2-tailed)		.000
	Ν	81	81
Cost Reduction	Pearson Correlation	.757**	1
	Sig. (2-tailed)	.000	
	N	81	81

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3 displays a correlation coefficient of 0.757** between green packaging and cost reduction, indicating a strong positive between green packaging and cost reduction. More so, the probability value (0.000) is less than the critical value (0.05), this shows that the relationship between green packaging and cost reduction is statistically significant; and implies that green packaging can be leveraged to achieve cost reduction electronics distribution companies in South-East Nigeria. Thus, the null hypothesis that there is no significant relationship between green packaging and cost reduction in South-East Nigeria.

Table 4: Correlation test for green packaging and Optimal Resource Utilization

		0)ptimal Resource
		Green Packaging	Utilization
Green Packaging	Pearson Correlation	1	.583**
	Sig. (2-tailed)		.000
	Ν	81	81
Optimal	Pearson Correlation	.583**	1
Resource Utilization	Sig. (2-tailed)	.000	
	N	81	81

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4 demonstrates a correlation coefficient of 0.583** between green packaging and optimal resource utilization. This indicates a moderate positive relationship between green packaging and optimal resource utilization. More so, the probability value (0.000) is less than the critical value (0.05). This shows that the relationship between green packaging and optimal resource utilization is statistically significant. This implies that electronics distribution companies in South-East can achieve improved optimal resource utilization by adopting green packaging. So, the null hypothesis that there is no significant relationship between green packaging and optimal resource utilization of electrical and electronics distribution companies in South-East Nigeria was rejected.

Discussion of Findings

According to the study's analysis, green packaging has a strong positive and statistically significant relationship with innovativeness and cost reduction; and a moderate positive and statistically significant relationship with optimal resource utilization. These findings are in line with the findings of Ahmed (2022) that green packaging enhances the sustainability of business. And the report of Maziriri (2020) that green packaging and green advertising have positive influence on competitive advantage and business performance.

Also, the present findings support the position that companies that switch from conventional packaging to green packaging meet functional and economic needs of present generations without compromising the ability of future generations to meet their own needs. In addition, our findings support that of Anucha et al. (2018) that recyclable packaging and packaging optimization have positive and significant relationship with environmental sustainability.

Conclusion and Recommendations

In view of the findings of this study and the findings of previous studies examined, this study concluded that green packaging positively and significantly relates with measures of supply chain competitiveness of electrical and electronics manufacturing companies in South- East Nigeria. This means that green packaging is an important green logistics practice that will improve supply chain competitiveness in terms of innovativeness, cost reduction and optimal resource utilization. Therefore, it is recommended that, the management of the electrical and electronics manufacturing companies should endeavour to effectively implement environmental systems and infrastructure which would allow for effective green packaging; ensuring such are duly aligned with the capacities of the firms.

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