

EFFECT OF DISRUPTIVE TECHNOLOGIES ON EFFICIENCY AND RESILIENCE IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

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ABSTRACT

This study investigates the influence of disruptive technologies on efficiency and resilience within Nigeria's fast-moving consumer goods (FMCG) logistics and supply chain sector. Utilizing a mixed-methods approach, primary data were collected through structured questionnaires and semi-structured interviews across medium to large FMCG firms. Data was collected using a structured 5questionnaire. Data was also analysed using percentages and spearman rank correlation coefficient. The findings of the study revealed that spearman rank correlation coefficient (ρ) = 0.736**, this value is high, implying that a strong relationship exists between technology adoption and resilience. The positive sign of the correlation coefficient indicates a positive relationship. That is to say that an increased technology adoption and will lead to an increase in resilience. The findings indicate that technologies such as AI, IoT, and cloud computing systems significantly improve operational efficiency, supply chain visibility, resilience and responsiveness to disruptions. The study further concluded that high implementation costs and infrastructural challenges remain key barriers. The study recommends increased investment in digital infrastructure, workforce training, and policy incentives to accelerate technology adoption.

Keywords: *Disruptive technologies, efficiency, logistics, supply chain, resilience.*

INTRODUCTION

Smith (2019) defined disruptive technologies as those things that significantly alter the way businesses or entire industries operate. The term disruptive technology was first coined by Christensen (1997) as an extension of Schumpeter's hypothesis of creative destruction. Disruptive technology refers to changes that result from technologies in an existing business model (White, 2017). In an era marked by rapid advancements in digitalization, automation, and data analytics, the logistics and supply chain industry has witnessed significant changes (Okwubali et al., 2023). Disruption is thought to occur when technological innovations make existing systems obsolete by bringing about decreases in price, simplification of processes, and convenience (Christensen, 2017).

Disruptive technology applies to hardware, software, networks and combined technologies. Because disruptive technology is new, it has certain advantages, enhancements and functionalities over competitors. As an unused, unapplied and untested alternative, it takes time for disruptive technology to be dominantly deployed, ultimately degenerating existing technology (Elgazzar & Hemayed, 2016). Disruptive technologies typically take longer to develop and are usually associated with a high level of risk (Christensen, Raynor & McDonald, 2015).

Disruptive technologies in supply chain management, such as Artificial Intelligence (AI) and blockchain, have been the subject of much study and discussion in recent years. These technologies

have the potential to transform the way supply chain management is done, providing greater efficiency, transparency, and security. Artificial intelligence can be used to automate and optimize various processes throughout the supply chain, from demand forecasting to inventory and logistics management. On the other hand, blockchain has the potential to increase transparency and trust in the chain, ensuring the integrity of transactions and simplifying bureaucratic processes such as documents and payments (Chen, 2018).

However, it has been established that these technologies have fast penetration and easily replace existing technologies. Often times, these technologies force companies to alter the way they approach their business, or risk losing market share or becoming irrelevant (Chen, 2018). According to Daneels (2004) and Markides (2006), disruptive technologies manifest in different manners with the main identification being that these technologies alter the competition framework by changing the performance parameters along which firms compete.

Supply chain management is a complex activity that involves various processes, from raw material acquisition to delivery of the final product to the consumer. In this context, efficiency and transparency are essential to ensure the competitiveness and sustainability of companies. However, supply chain management is also supported by several challenges, such as lack of visibility, chain complexity, supplier diversity, and lack of trust among the involved parties. To overcome these challenges, companies have resorted to disruptive technologies such as artificial intelligence and blockchain.

Supply chain management uses a systematic approach to view the supply chain as an integrated whole, not as a collection of elements that work independently (Mentzer et al, 2001). In other words, the supply chain management philosophy extends the concept of multi-enterprise integration to manage the total flow of goods from suppliers to key customers. Therefore, supply chain integration is a set of beliefs that each company in the supply chain directly or indirectly affects the performance of all other supply chain members and ultimately affects supply chain efficiency. This set of beliefs is also understood as supply chain orientation (Mentzer et al, 2001); (Storer et. al, 2014).

According to Heizer and Render (2005) in (Storer et. al, 2014) there are several supply chain integrations, namely:

- i. Internal integration, in an enterprise this integration can replace the structural and administrative roles of SC capabilities which have an interactive relationship with cost leadership capabilities for performance improvement. Internal integration includes cross functional integration consisting of the purchasing function, marketing function, and sales function.
- ii. External Integration, in relation to suppliers and customers this integration can replace the role of SC technology and logistics capabilities that interact with innovative marketing, differentiation, and customer service capabilities for performance improvement.

In addition, according to (Heizer, 2005) there is also vertical integration, where companies develop their production gradually forward and backward, namely by buying finished products and buying raw materials from suppliers in building synergies. Supply chain integration is a benchmark for a company in the integration and synergy between business lines, both operational and strategic capacities to be used as a competitive force and to encourage innovation in the face of competition for a wide market share. Langley and Holcomb in (Mentzer et al, 2001), conclude that the pinnacle of supply chain management is customer value through synchronizing supply chain activities. Thus, supply chain management shows that the boundaries of supply chain management include not only the flow of goods, but also all other functions within and between enterprises in the supply chain,

for value creation and customer satisfaction. In other words, supply chain management encourages supply chain members to create synchronous and systematic integration.

The growing complexity of global and regional supply chains necessitates the adoption of technologies that enhance both operational efficiency and resilience. In emerging economies like Nigeria, where supply chains often face systemic disruptions, the integration of disruptive technologies becomes particularly critical. Disruptive technologies such as Artificial Intelligence (AI), Internet of Things (IoT), blockchain, and cloud computing are redefining logistics and supply chain structures across sectors.

STATEMENT OF THE PROBLEM

Movement of goods across the globe is a constant, this process involves multiple parties using different channels for information and communication flows. Each company uses its own operational data and there is little interest in sharing information with partners to protect privacy. This leads to a process that lacks transparency and the participants are provided with asynchronous information (Nakamoto, 2008). Another problem is the reliance on a trusted third party when transactions are carried out between two parties (Swan, 2015).

These problems relate to the concepts of privacy, transparency and trust. The role of these concepts in a blockchain in logistics setting is not yet explored from a Kenyan context (Kimani, 2018). The Blockchain technology has aspects that can solve the existing problems but there are also obstacles. Much of the research on Blockchain technology in general has been conducted in the financial sector (Beck & Müller-Bloch, 2017, Yli-Huumo et al., 2016). Korpela et al. (2017) identified the lack of fundamental functionalities in the services currently operating intermediaries in the logistics sector.

Some of the missing functionalities like the record and storage of transactions are already embedded in the Blockchain technology, but they have yet to be exposed in a logistics setting. Hence, this study explores how these technologies affect efficiency and resilience in Nigeria's FMCG sector—one of the most dynamic but logistically challenging industries in the country

OBJECTIVES OF THE STUDY

The specific objective of the study is to:

- i. examine the innovation-driven nature of disruptive technologies and their impact on logistics transformation.
- ii. determine the challenges affecting disruptive technology innovation.

LITERATURE REVIEW

Disruptive technologies are innovations that significantly alter industry operations by introducing efficiency and flexibility (Christensen, 1997; Ghosh, 2021). In logistics and supply chain management, they facilitate real-time decision-making, automation, and enhanced customer engagement (Ivanov & Dolgui, 2020). Studies by Dubey et al. (2020) highlight how digital platforms improve responsiveness to demand volatility and external shocks.

Attributes of innovation-driven nature on disruptive technologies

The attributes of technological innovation can be seen as novelty, breakthrough and influence as measurement indicators. The term "disruptive innovation" was popularized by Clayton Christensen (1997), who argued that technological innovation can upend market leaders when it originates from simpler, more affordable, and more accessible solutions that meet the needs of a previously neglected segment. Over time, these innovations improve rapidly, eventually meeting the needs of mainstream users and replacing incumbent technologies.

Disruptive technologies are innovation-driven in that they:

- i. Leverage radical or incremental innovations.
- ii. Often result from R&D-intensive processes.
- iii. Thrive in innovation ecosystems, such as tech clusters or digital platforms.
- iv. Benefit from cumulative scientific knowledge and cross-disciplinary insights.

Many disruptive technologies stem from basic and applied scientific research. Artificial Intelligence (AI) and Machine Learning have emerged from decades of research in computer science, statistics, and cognitive neuroscience (LeCun, Bengio & Hinton, 2015). Blockchain technology is rooted in cryptographic principles and distributed computing (Nakamoto, 2008). Biotechnology advances like CRISPR/Cas9 stem from molecular biology breakthroughs (Jinek et al., 2012). These innovations are not only technological breakthroughs; they represent paradigm shifts that open up entirely new applications, business models, and socio-economic implications.

Role of Technological Advancement in Resilience Building on Supply Chain Logistics Management

In today's volatile global environment, supply chains are increasingly vulnerable to disruptions caused by pandemics, geopolitical conflicts, cyber threats, climate events, and market fluctuations. To mitigate these risks, logistics and supply chain systems must prioritize resilience. This is the capacity to prepare for, respond to, and recover from disruptions while maintaining continuity of operations. Technological advancement is at the heart of this transformation, offering tools and frameworks to enhance visibility, agility, adaptability, and collaboration across the supply chain.

Supply Chain Resilience

Supply chain resilience refers to the ability of a logistics network to anticipate disruptions, respond to unexpected events, and recover to a stable state with minimal losses. Technological advancements bolster these capacities through enhanced data collection, processing, communication, automation, and decision-making tools (Pettit, Fiksel & Croxton, 2010). These technologies are not merely enhancing existing processes—they are redefining logistics paradigms, enabling real-time visibility, intelligent automation, agile supply chains, and customer-centric delivery models. The key technological drivers of resilience in logistics are:

Automation and Robotics

Innovation Aspect: Advancements in robotics, computer vision, and machine learning have led to the development of intelligent robots capable of autonomous decision-making in warehousing and last-mile delivery. Technologies like automated guided vehicles (AGVs), robotic arms, and drones optimize warehouse operations by improving speed, accuracy, and safety (Winkenbach et al., 2016). Automation reduces dependence on manual labour and addresses shortages, especially during peak demand. Robotics enables continuous, uninterrupted operations with minimal human supervision.

Internet of Things (IoT)

IoT combines sensor technologies, wireless communication, and real-time analytics to connect physical assets across the supply chain. IoT sensors enable asset tracking, temperature monitoring for perishables, and predictive maintenance of fleet vehicles (Mishra et al., 2021). Smart shelves and RFID systems allow for accurate, automated inventory counts. Early warning systems help mitigate risks related to theft, spoilage, and equipment failure.

Artificial Intelligence (AI) and Machine Learning

AI, particularly predictive analytics and optimization algorithms, enhances decision-making through data-driven insights. Models analyze historical and real-time data to improve demand planning accuracy (Choi et al., 2018). AI-powered platforms optimize delivery routes dynamically based on traffic, weather, and delivery windows. Chatbots and AI-driven service desks improve responsiveness and customer satisfaction.

Blockchain Technology

Blockchain enables decentralized, tamper-proof record-keeping, which enhances transparency and trust across the supply chain. Critical in sectors like pharmaceuticals, food, and luxury goods, ensuring authenticity and compliance. It automates payment releases and contract execution based on fulfillment of predefined logistics conditions. Blockchain reduces paperwork and improves auditability of logistics transactions (Francisco & Swanson 2018).

Autonomous Vehicles and Drones

This is driven by breakthroughs in sensor fusion, LiDAR, AI navigation, and battery technologies, autonomous vehicles and delivery drones are redefining transportation. It lowers labour costs and fuel consumption through route efficiency and electrification. Drones and small autonomous vehicles enhance delivery in urban, rural, or hard-to-reach areas. It brings total reduction to accidents caused by human error, particularly in long-haul trucking (Hwang & Choi, 2019).

Cloud Computing and Digital Platforms

Cloud platforms provide scalable, interoperable, and real-time systems that integrate all parts of the supply chain. It enables flexible and scalable logistics functions outsourced via digital platforms (e.g., Uber Freight). Improves coordination between suppliers, manufacturers, and logistics providers. It also centralizes data analytics for end-to-end supply chain visibility and decision support.

Challenges affecting disruptive technological adoption

These challenges require coordinated investment in training, governance, and infrastructure. Therefore, while technology enhances resilience, its implementation must consider cybersecurity risks, cost and complexity of integration, interoperability across diverse systems and stakeholders and skill gaps among the workforce. However, in developing countries like Nigeria, adoption is constrained by infrastructural deficits, cost barriers, and skill gaps (Akanbi & Ajayi, 2019). This study fills the gap by focusing on Nigeria's FMCG sector, where the balance between efficiency gains and implementation challenges is particularly delicate.

THEORETICAL REVIEW

The Resource Based Theory

One of the best theories in the field of innovation and competitiveness research is the Resource Based theory, which was developed by others after being proposed by Penrose in 1959 (Mulligan, 2018). According to the principle, businesses have resources that they can use to gain a competitive edge. According to the notion, a company can obtain a competitive edge by having unique resources or competencies that are valuable, hard to duplicate, and uncommon in the industry. This viewpoint's proponents contend that businesses should use internal rather than external sources of competitiveness (Tascott, et al. 2017). Proponents of RBV contend that it is far more practical to take advantage of outside chances by repurposing already-existing resources than it is to try to learn new skills at every opportunity.

Businesses value their resources and procedures because they have an impact on their behavior and operations. According to Carson (2018), a resource is an asset, skill, organizational procedures, information, knowledge, or capability. It is deemed unique if it is priceless, uncommon, challenging to duplicate, and lacks a close equivalent. Unique resources are what give businesses long-term competitiveness and greater profits (Goldfarb, 2018; Autor, 2018). A company is viewed as a well-coordinated collection of resources that it may use to gain a long-term competitive advantage (Barney, 2019).

Firm resources encompass human, social, technological, knowledge-based, physical, and financial assets that are semi-permanently attached to it (Zhu & Scott, 2018). Businesses that own uncommon and difficult-to-copy valuable resources get a long term competitive edge through the development of creative new goods (Warren, 2018). By supplying the inputs that are integrated and transformed to produce innovations that increase firm competitiveness, organizational resources have a positive impact on the innovation process (Walsh, 2018). By producing valuable, uncommon, and difficult-to-imitate outputs, innovation gives a company a competitive advantage (OECD, 2019).

One of the most crucial sets of resources that a company may utilize to promote innovative operations, particularly research and development, is money. Human capital is also a crucial factor in determining the competitiveness and performance of a company. Knowledge-based resources are another important asset for a company's competitiveness. Understanding makes it easier to find inspiration and take advantage of chances for innovation. As a result, it helps with the development, manipulation, and transformation of other resources for competitiveness (Wiklund & Shepherd, 2019; Lee & Sukuco, 2019; Wang et al., 2019; Idenedo et al., 2020).

EMPIRICAL STUDIES

Fouad et al. (2018) investigated the innovation process impact on the new product performance in Morocco fish industry. The organisation strives to establish a modernised value chain that supports product innovation in its performance generation. The underlying objective of the study was to measure the impact of value chain on the performance of new product, taking into account the initial stages of development. The empirical implications of the study shows that accelerating the execution of innovation activity is enormously favoured to increase the performance of the innovative product over the medium term. This enables an organisation to be efficient in terms of market entry with good quality of new product (Fouad et al., 2018).

Sawng et al. (2018) examined technology adoption and company performance a correlation analysis with evidence of Korean export companies. The study purpose was to examine the useful implications for Korean export companies adopting smart technology for the improvement of their performance in the era of industrial convergence. The researchers adopted five-stage procedure and methods. The study established that the effects of technology on export companies performance was still unsatisfactory and Organizational Performance proved to be top priority area, the study also established that strategic decision-making is required for adoption smart technology in the perspective of technology convergence to improve the performance of companies among heterogeneous firms. The practical implications of the study findings are in the global market, not only technology convergence in the same sector but also industrial convergence in different organisations is essential for service firms with a perspective of innovation (Sawng et al., 2018).

Zhu et al. (2018) conducted a comparative study of the effects of different factors on firm technological innovation performance in different high-tech organisations, the study examined six variables using semi-parametric models based on data of GEM listed firms between 2010-2015. The model used ensured that influencing factors of firm technological innovation performance are no longer restricted to a particular aspect but can provide a comprehensive comparative analysis of the factors. Study finding shows that research and development expenditure have positive impact on organisational technological innovation performance, investment and government subsidies have a significant and positive impact on an organisation's technological innovation performance in knowledge oriented industries. Technology diversity has a significant and positive impact on organisational innovation performance (Zhu et al., 2018).

Okwubali et al (2023) in their work explores the transformative influence of technology innovations on the field of logistics and supply chain management. In an era marked by rapid advancements in digitalization, automation, and data analytics, the logistics and supply chain industry has witnessed significant changes. This abstract provides a glimpse into the key themes addressed in the seminar, including the adoption of IoT and blockchain, the role of artificial intelligence, and the integration of e-commerce. The research discusses how these technological developments have enhanced efficiency, transparency, and sustainability in the logistics and supply chain domain. It also examines the challenges and opportunities that arise from these innovations, shedding light on their potential to reshape the future of global trade and commerce.

Zainuddin (2021) in his study aims to analyze the effect of supply chain integration on operational performance, and also to analyze the effect of competitive advantage on operational performance. The sample used in this study were 42 managers/heads of the supermarket production division in Ambon City. The data analysis technique used is Partial Least Square (PLS). The results show that supply chain integration has a positive effect on operational performance, the results also show that competitive advantage has a positive effect on operational performance.

Samuel (2022) this systematic review examines the impact of disruptive events on supply chain resilience, focusing on strategies and lessons that organizations can adopt to navigate challenges effectively. With the increasing frequency and complexity of disruptions stemming from natural disasters, geopolitical instability, pandemics, and technological failures, understanding how supply chains can adapt and recover is more critical than ever. This study systematically reviews existing literature to identify the key factors contributing to resilience, including the role of technology, collaboration, adaptability, and sustainability. The review explores how proactive risk management strategies, such as predictive analytics and diversification, enable organizations to anticipate and mitigate potential disruptions. It also delves into the transformative role of digital tools like blockchain, artificial intelligence, and big data in enhancing visibility and decision-making processes. Collaborative practices, including stakeholder engagement and trust-building, are highlighted as essential components in fostering coordinated and effective responses. The findings emphasize that resilience is not a static attribute but a dynamic capability requiring continuous learning, innovation, and alignment with sustainability principles. Furthermore, the review underscores the importance of leadership, organizational culture, and investment in advanced technologies to build robust supply chains that can withstand disruptions and capitalize on opportunities. By synthesizing insights from diverse studies, this review provides a comprehensive understanding of supply chain resilience and offers practical recommendations for practitioners and policymakers to enhance resilience in an increasingly volatile global environment. The conclusions serve as a foundation for future research and contribute to the ongoing discourse on managing supply chain disruptions.

Elizabeth and Gabriel (2021) this paper empirically examined the relationship between supply chain integration and marketing performance of Oil servicing firms in Nigeria. It adopted an explanatory research design and primary data was collected from ten (10) prominent Oil servicing firms in Nigeria. A structured questionnaire was used to elicit responses (primary data) from respondents of the Oil servicing firms in Nigeria and analyzed using inferential statistics. The Spearman rank order correlation coefficient was used to determine the relationship between the dimensions of supply chain integration (strategic alliances and information sharing) and measures of marketing performance (customer satisfaction and customer loyalty). Findings were made, and the study concluded that supply chain integration can positively and significantly enhance marketing performance of Oil servicing firms in Nigeria. This study recommends that Oil servicing firms in Nigeria should reinforce their supply chain integration strategies (strategic alliance and information sharing) to achieve optimum marketing performance.

METHODOLOGY

A mixed-method approach was employed, combining quantitative surveys and qualitative interviews. The target population consisted of supply chain professionals from FMCG firms across Nigeria. A purposive sampling method was used to select participants from companies known to be adopting technology in their logistics operations. Structured questionnaires with Likert-scale items were distributed to 120 participants; 103 valid responses were received. Interviews were conducted with 12 logistics and IT managers to gather deeper insights. Data were analyzed using descriptive and inferential statistics.

RESULTS

Out of 120 distributed questionnaires, 103 were completed and returned, giving a response rate of 85.8%. The respondents included supply chain managers (35%), logistics officers (25%), IT/technology specialists (20%), and operations managers (20%), with over 60% of respondents having more than 5 years of experience in the industry. Most companies surveyed (65%) were medium to large-sized FMCG firms operating in major urban centers like Asaba and Onitsha.

Table 1: Technology Adoption and Usage

Disruptive technologies	Percentage (%)
Artificial Intelligence and data analytics	60
Internet of Things	55
Cloud Computing	50
Blockchain	20
Drones and Autonomous delivery vehicle	10

Table 1 revealed that over 78% of respondents confirmed that their organizations had adopted at least one form of disruptive technology. This indicates that 78% of firms use at least one disruptive technology. AI and IoT were the most prevalent, followed by cloud-based platforms. Only a small fraction had adopted blockchain or autonomous delivery vehicles. This confirms a growing trend in Nigeria’s FMCG sector toward digital transformation, driven by the need for competitiveness, visibility, and customer-centric logistics. Despite infrastructural challenges, firms are willing to invest in efficiency-enhancing technologies.

Table 2a: Efficiency Gains (mean score)

Efficiency outcomes	Mean score
Operational efficiency	4.3
Delivery speed and accuracy	4.1
Cost reduction	3.8
Collaboration with supply partners	3.7

Based on mean score on a 5-point likert scale

Table 2b: Resilience Outcomes

Resilience enhancement	Mean score
Responsiveness to disruption	4.2
Supply chain visibility	4.5
Risk management	4.0

Based on mean score on a 5-point likert scale

Table 2a showed that the respondents reported high improvements in operational efficiency (mean score = 4.3), delivery accuracy (4.1), and order fulfillment speed (4.0). Technologies enabled real-time tracking and demand forecasting. Table 2b revealed significant gains were observed in supply chain visibility (4.5), responsiveness to disruptions (4.2), and risk anticipation (4.0). Firms cited faster recovery from fuel crises, transportation bottlenecks, and supplier delays. Disruptive technologies significantly enhanced logistics efficiency through automation, real-time tracking, and data-driven decision-making. Increased supply chain visibility through IoT and ERP tools allowed for better anticipation of disruptions such as roadblocks, fuel scarcity, and supply shortages, which are common issues in Nigeria.

Challenges to Technological Adoption

Respondents identified the following major barriers to technology adoption:

Table 3: Barriers to technology adoption

Barriers	Percentage (%)
High cost of implementation	68
Lack of technical expertise	55
Poor infrastructure	50
Resistance to change	40
Data security concerns	30

Table 3 indicated that companies noted the need for cultural change and continuous training. Resistance was more common among older staff and in departments with low digital literacy. Cost remains a significant barrier, especially for SMEs, while large firms can afford full digital transformation, smaller logistics operators face funding constraints. Additionally, Nigeria's infrastructural deficits hamper the consistent performance of digital platforms. The results also revealed that staff training and change management are crucial for smooth tech adoption.

Hypotheses

This study is subjected to statistical tests using the Spearman Rank Correlation Co-Efficient Statistical Tool

Table 4: Description of the degree of relationship between variables

Correlation coefficient (rho)	Description
± 0.80 – 1.0	Very strong
± 0.60 – 0.79	Strong
± 0.40 – 0.59	Moderate
± 0.20 – 0.39	Weak
± 0.00 – 0.19	Very weak

The positive (+) sign in the value of r indicates a direct/positive relationship while negative (-) sign in value of r indicates an indirect/negative or inverse relationship. Therefore, the sign of the r value explains nature of relationship between the variables

Decision Rule

Reject the null hypothesis (Ho) if $PV < 0.05$ for 2-tailed test and conclude that significant relationship exists.

Relationship between technology innovation adoption and resilience

The study hypothesized that technology innovation adoption and resilience has no significant relationship. The result presented in Table 2 provides statistical proof showing the extent of the relationship between the variables.

Table 5: Spearman Rank correlation analysis on technology adoption innovation and resilience

			Technology adoption innovation	Resilience
Spearman rho	Technology adoption innovation	Correlation coefficient	1.000	.736**
		Sig (2-tailed)		.000
		N	103	103
	Resilience	Correlation coefficient	.736**	1.000
		Sig (2-tailed)	.000	
		N	103	103

** . Correlation is significant at the 0.05 level (2-tailed).

Source: (SPSS Output version 23)

Table 5 above shows the Spearman rank correlation coefficient (ρ) = 0.736**, this value is high, implying that a strong relationship exists between technology adoption and resilience. The positive sign of the correlation coefficient indicates a positive relationship. That is to say that an increased technology adoption and will lead to an increase in resilience. From the findings in Table 5, the probability value is (0.000) < (0.05) level of significance; hence the researcher rejects the null hypothesis and concludes that there is a significant relationship between technology adoption and resilience. This is in tandem to the resource based theory that businesses have resources that they can use to gain a competitive edge. According to the notion, a company can obtain a competitive edge by having unique resources or competencies that are valuable, hard to duplicate, and uncommon in the industry (Hazell, 2020).

CONCLUSION

The study demonstrated that disruptive technologies play a pivotal role in enhancing both efficiency and resilience in Nigeria's FMCG logistics sector. Technologies like AI, IoT, and cloud based systems are helping firms overcome long-standing operational challenges. However, for the full potential to be realized, there is a need for policy support, investment in infrastructure, and strategic workforce development.

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