EFFECT OF PRODUCT AND MARKET INNOVATION ON PERFORMANCE OF MANUFACTURING FIRMS IN NORTH EAST NIGERIA.

[1]MUSA, Idris Umar[1] & [2]Ahmed Abdullahi Ibrahim PhD
[1]Department of Business Administration, The Federal Polytechnic Nasarawa
[2]Department of Business Administration, Nasarawa State University, Keffi
Email:adagabamusa@gmail.com

Abstract
The need for firms to innovate in both products and marketing strategies has become essential to ensure sustainability and growth. Product and market innovations are seen as key drivers of profitability, market share expansion, and customer satisfaction. However, there is limited empirical research examining how these types of innovations impact the performance of manufacturing firms in this region. This study seeks to fill this gap by investigating the relationship between product innovation, market innovation, and firm performance in manufacturing firms in North-Eastern Nigeria. This study investigates the effect of product innovation and market innovation on the performance of manufacturing firms in North-Eastern Nigeria. Adopting a cross-sectional survey design, the study targets a population of 422 management employees across 20 registered manufacturing firms. Data was collected using a structured questionnaire with a five-point Likert scale to measure respondents' perceptions of innovation practices and firm performance. The study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the data. The findings reveal that both product innovation and market innovation have a positive and significant impact on firm performance. The study underlines the importance of innovation as a key determinant of business success and recommends that firms prioritize investment in product innovation while adopting new marketing strategies to sustain growth in North-Eastern Nigeria's manufacturing sector.
Keyword: *Product Innovation, Market Innovation, Firm Performance, Manufacturing Firms, North-Eastern Nigeria*

INTRODUCTION

The critical role that manufacturing enterprises play in national economies has come into greater focus in recent years. These businesses, especially in less developed countries, have a major positive impact on innovation, economic growth, and the creation of jobs. Historically, the manufacturing sector has been thought of as the catalyst for inclusive, sustainable economic growth. Although the manufacturing sector still fulfills this role today, the recent trend of globalization has given it a larger role in enhancing innovation and boosting economic competitiveness.

Innovation is a critical driver of competitiveness and sustainable growth in the manufacturing sector, enabling firms to adapt to changing market demands, improve efficiency, and develop unique products and services. In an increasingly globalized economy, the ability to innovate has become essential for firms to remain relevant and competitive. Malerba and McKelvey (2020) emphasized the role of innovation as a key component of economic development, highlighting how new products, processes, and market strategies can transform industries and create competitive advantages. Similarly, Miller, (2019) posits that firms with unique resources and innovative capabilities can achieve superior performance.

In the manufacturing sector, product and market innovation play significant roles in enhancing operational efficiency, expanding market share, and improving customer satisfaction. Product innovation involves introducing new or significantly improved goods, while market innovation focuses on identifying and penetrating new markets or employing innovative marketing strategies. These aspects of innovation are crucial for firms to meet customer expectations, differentiate themselves from competitors, and achieve long-term growth (OECD, 2018).

Despite the potential benefits of innovation, manufacturing firms in North East Nigeria face unique challenges that hinder their ability to innovate and achieve optimal performance. The region has been significantly affected by economic volatility, resulting in high operational costs and limited access to capital. Insecurity, driven by insurgency and social unrest, has disrupted supply chains, discouraged

investments, and led to the closure of several manufacturing firms (Ahmed, 2021). Additionally, limited market access due to poor infrastructure and geographical isolation has further constrained the growth and competitiveness of these firms (World Bank, 2022).

However, firms in regions with unique socio-economic challenges, such as North East Nigeria, innovation particularly product and market innovation has been identified as a critical enabler for overcoming such challenges and driving firm performance. Innovative products are more likely to succeed when supported by effective marketing strategies, while market innovations are more impactful when they promote unique products. Savitri *et al.* (2023) noted that firms combining these innovations experienced enhanced market adaptability and financial outcomes. The nexus between product and market innovation and firm performance is a cornerstone of competitive strategy. When effectively integrated, these innovations not only enhance individual performance metrics but also foster long-term resilience and adaptability.

Despite substantial evidence on the positive effects of innovation on business performance in other regions and sectors, significant gaps remain in understanding how these dynamics play out in North East Nigeria. Existing studies provide insights into the relationship between innovation and performance but often focus on different contexts. For example, Savitri *et al.* (2023) demonstrated that innovation, combined with business strategy and market orientation, significantly enhances business performance in Indonesian SMEs. Similarly, Exposito and Sanchis-Llopis (2018) provided evidence from Spanish SMEs, showing that innovation improves performance when assessed through a multi-dimensional approach. These findings underscore the potential of innovation to boost performance, but their applicability to Nigeria's manufacturing sector especially in the challenging context of the North East remains underexplored.

Research in African contexts, such as Ajayi *et al.* (2024), has highlighted the mediating role of research and development in linking marketing innovation to SME performance in Oyo Township, Nigeria. This suggests that region-specific factors, such as socio-economic and infrastructural challenges, can influence the effectiveness of innovation strategies. Similarly, Daodu and Bhaumik (2024) examined innovation's role in Nigeria's service sector, linking it with business analytics and enhanced performance, but did not extend the analysis to manufacturing firms in regions facing unique adversities.

Moreover, eco-innovation has been found to influence business performance positively in food-processing enterprises, as observed in Jordan by Al-Hanakta *et al.* (2023). However, eco-innovation's applicability and broader lessons for product and market innovation in Nigerian manufacturing firms remain under-researched.

This study seeks to address these gaps by investigating how product and market innovation influence the performance of manufacturing firms in North East Nigeria. It aims to provide context-specific insights that will guide policymakers and practitioners in leveraging innovation to overcome regional challenges and enhance firm competitiveness and growth. To achieve this objective, the following hypotheses are proposed:

$H0_1$: Product Innovation has no significant effect on performance in manufacturing firms in North East Nigeria.

$H0_2$: Market Innovation has no significant effect on performance in manufacturing firms in North East Nigeria.

LITERATURE REVIEW

Firm Performance

Conceptually, two extreme trends have emerged among managers and scholars to address the shortcomings of performance measurement. The first focuses primarily on financial indicators, while the second focuses primarily on operational measures. Some attempted to improve financial performance measurement methods by developing concepts such as economic profit, Economic Value Added, or free

cash flow analysis. Others tried to improve operational efficiency by developing concepts and methods, such as Activity, Based Costing, Activity Based Management, Quality Management, JIT systems, etc. (Adam and Alarifi, 2021)

Firm performance, defined as the outcomes of a firm's business activities (Kotane *et al.*, 2017), has been conceptualized through two main perspectives: financial and operational measures. While financial metrics such as Economic Value Added and free cash flow analysis focus on profitability (Adam and Alarifi, 2021), operational measures emphasize efficiency using tools like Activity-Based Costing and Quality Management systems. Performance is seen as the achievement of objectives that align with stakeholder interests, accomplished by utilizing resources efficiently in internal and external contexts (Sani *et al.*, 2015; Wu, 2009).

Firm performance is closely tied to a company's ability to achieve growth and profitability goals, with indicators such as sales, workforce, profit, assets, and equity serving as key metrics (Haghighinasab *et al.*, 2015; Shepherd and Wiklund, 2009). Neely *et al.* (1995) argue that performance reflects how well firms meet objectives and exceed customer requirements, highlighting the importance of outperforming competitors to attain sustainable success.

Product Innovation

Product innovation is broadly defined as the introduction of new or improved goods or services that address customer needs and enhance product quality (Febrianti and Herbert, 2022). It involves creating distinct products that differentiate from previous offerings, either through entirely new items or upgrades to existing ones (Un *et al.*, 2010; Ilsev and Gumusluoglu, 2009). Additionally, it encompasses the development of unique ideas that result in significant changes to a firm's final products or services (Prjogo *et al.*, 2007).

Marketing Innovation

Marketing innovation, as described by Gupta *et al.* (2016), encompasses developing new products or services, innovative pricing and promotional strategies, creative distribution channels, and advanced marketing information systems. It involves crafting unique and effective marketing approaches, with a growing emphasis on using software tools to gather customer data, highlighting the essential role of innovation in ensuring a company's success.

Product Innovation and Firm Performance

Thanh and Dung (2024) examined the connection between green innovation and business performance, using cost leadership competitive advantage as a mediating factor. The study examined the assumptions using a structural equation model that used the partial least squares approach (PLS-SEM). Through a survey, a questionnaire was used to gather data. Utilizing data from 121 middle and senior managers of Vietnamese manufacturing companies, SmartPLS 3 was used to examine the findings. The findings showed that Vietnamese manufacturers' performance is enhanced by green innovation in both green product and green process areas. Moreover, the association between green process innovation and firm performance is fully mediated by cost leadership competitive advantage, but the relationship between green product innovation and firm performance is not mediated by it. However, a contemporary investigation from a new viewpoint or area is still necessary.

Ayinaddis (2023) in their study aimed to examine the effect of innovation on the performance of micro and small manufacturing firms in selected towns of Awi Zone, Amhara, Ethiopia. The target population of the study was 643 micro and small manufacturing firms in Injibara, Dangila, and Tilili; a number provided by Awi zone enterprise development of data during 2021. Data were drawn from a sample of 247 manufacturing firms using cross-sectional primary data collected from wood and metal manufacturing firms in selected towns of Awi Zone. The study adopted descriptive and explanatory designs and used correlation and multiple linear regression analysis to estimate the effect of innovation on firm performance. The regression results revealed that product, process, marketing and organizational

innovation were positively and significantly related to firm performance, while product innovation was found to have a strong positive effect on the dependent variable firm performance followed by process and organizational innovation, respectively. However, a weak statistical relationship was reported between marketing innovation and the performance of manufacturing firms than other variables. Hence, firms which have a strong orientation towards product, process, organizational and marketing innovation have better performance in manufacturing firms in the study area. The study was conducted in Ethiopia which cannot be applicable in the Nigerian context.

Bedraoui and Lhassan (2022) investigated the individual impacts of innovations on the performance of 112 hotel establishments in Morocco. Innovation was assessed across various dimensions including product, process, organizational, marketing, and environmental innovations. Structural equation analysis via Smart-PLS was employed for analysis. The findings revealed that these five innovation dimensions positively affect firm performance both financially, in terms of revenue, firm profit, and RevPAR, and non-financially, by enhancing occupancy rates, social climate, and organizational practices within the firm. However, the study was carried out in Morocco which limits its findings from general applicability due to geographical constraint.

The link between product innovation and firm performance was investigated by Mahto *et al.* (2022). The researchers followed Lipsey and Wilson's (2001) Meta-Analysis procedure, also known as the LW procedure, for every stage of the process, from study selection to the analysis of coded data. Meta-Analysis (MA) was used to summarize, interpret, and compare various empirical studies that examined the construct and relationship. The research discovered that a firm's success is significantly and favorably impacted by product innovation. The study used Meta-Analysis to analyze their data which may give a different outcome with this study as partial least square of structural equation modeling was used to analyze the data for this study.

Zand and Rezaei (2020) investigated the impact of process and product innovation strategies on business performance due to the dynamic environmental mediator role. The statistical population of the study consisted of 36 managers of Iranian banking industry. Questionnaires were used for data collection. Structural equation modeling was used to analyze the data. The results showed that process and product innovation strategies have a positive and significant effect on business performance. Also, Sobel test results indicated that at 95% confidence level, process and product innovation strategies through dynamic mediator variable. Environment has a positive and significant impact on business performance. However, the sample size is too small to be a representative of a larger populace.

Marketing Innovation and Performance

The relationship between marketing innovation and entrepreneurial performance of SMEs has been explored in various studies, with consistent findings indicating a positive and significant impact. Okundi and Muchemi (2022) investigated this effect among SMEs in Nakuru East Town Sub-County, Kenya, using a descriptive and explanatory design with data collected through questionnaires and interviews. Their analysis revealed a strong correlation between marketing innovation strategies and improved entrepreneurial performance, including market share growth, customer satisfaction, and profitability. The study highlighted the importance of product redesign, adopting new distribution channels, exploring new markets, and updating advertising methods. However, the findings were region-specific and may have limited general applicability.

Similarly, Walobwa *et al.* (2013) examined marketing innovation within Nairobi-based garment SMEs, employing a descriptive research design with structural equation modeling. Their study identified marketing innovation as the most influential factor in the growth of garment SMEs in Nairobi's Jericho market, highlighting its relevance in the business expansion of the sector. In a related study, Adam and Alarifi (2021) focused on the furniture industry, using quantitative analysis and regression techniques. They found that marketing innovation strategies positively impacted SMEs' efficiency and performance,

with all variables showing strong correlations. Both studies reinforce the critical role of marketing innovation in fostering business success across industries.

Further, Cuevas-Vargas et al. (2021) analyzed the adoption of ICTs in marketing innovation as a strategy to enhance SME performance in manufacturing. Using a quantitative approach with Partial Least Square Structural Equation Modeling, they found that marketing innovation significantly improved business performance. Moreover, the adoption of ICTs moderated the relationship, strengthening its positive effects. These findings suggest that marketing innovation strategies, coupled with technological advancements, can lead to substantial performance improvements. However, they call for further research in different regions and contexts to validate and expand these insights environments, such as Nigeria.

Schumpeter Theory of Innovation

According to Schumpeter (1934), economic development is driven by structural changes fueled by innovation, rather than by consumer preferences, which play a passive role in this process. Schumpeter categorized innovation into five types: introducing new products or variations, employing revolutionary production or sales methods, establishing new markets, sourcing new materials, and restructuring industries, such as creating or dismantling monopolies. He argued that innovation is essential for competitiveness (Porter and Stern, 1999) and economic dynamics (Hanush and Pyka, 2007). This process involves industrial mutation, continuously destroying old economic structures and creating new ones (Schumpeter, 1943).

Schumpeter also emphasized the importance of diffusion and imitation over invention in shaping the economy. While fundamental innovations initially have limited macroeconomic impact, their widespread adoption and imitation significantly drive economic growth, investment, and employment. This phase, marked by the recognition of profitable opportunities by imitators, leads to substantial investments in new technologies, further transforming the economic landscape (Freeman, 1987; Burton-Jones, 1999).

Diffusion of Innovation Theory

One of the earliest social science theories is the Diffusion of Innovation (DOI) Hypothesis, which was created by Rogers (1962). It first appeared in communication to describe how an idea or product gathers steam and diffuses (or spreads) within a particular population or social system over time. People eventually adopt a new idea, habit, or product as a part of a social system as a result of this dissemination. When someone adopts, they do something that is different from what they previously did (i.e., purchase or use a new product, acquire and perform a new behavior, etc.). Adoption depends on a person's ability to see an idea, behavior, or product as novel or inventive. This allows for the possibility of dissemination. A social system does not embrace a new concept, activity, or product all at once; rather, adoption of an innovation occurs over time, with certain individuals being more likely to do so than others. According to study, those who integrate improvements earlier than those who do so later exhibit various characteristics. Knowing the features of the target market that will help or hamper recognition of the idea is vital when advertising it to that group. Even if the majority of people fit into one of the five established adopter types, it is still crucial to understand the characteristics of the target audience. Many tactics are employed while advertising an innovation to appeal to the various adopter segments.

METHODOLOGY

The study adopted a cross-sectional survey research design, which involves collecting data at a single point in time to examine the relationships between product innovation, market innovation, and firm performance. This design is particularly suitable for assessing the influence of innovative practices on performance metrics, as it allows for capturing the perceptions, strategies, and outcomes of firms within a defined timeframe.

The study targeted a population of 422 management employees across 20 registered manufacturing firms operating in North-Eastern Nigeria CAC,(2024) has positive effect on Performance in manufacturing

firms in North East Nigeria involved in implementing product and market innovation strategies within their organizations.

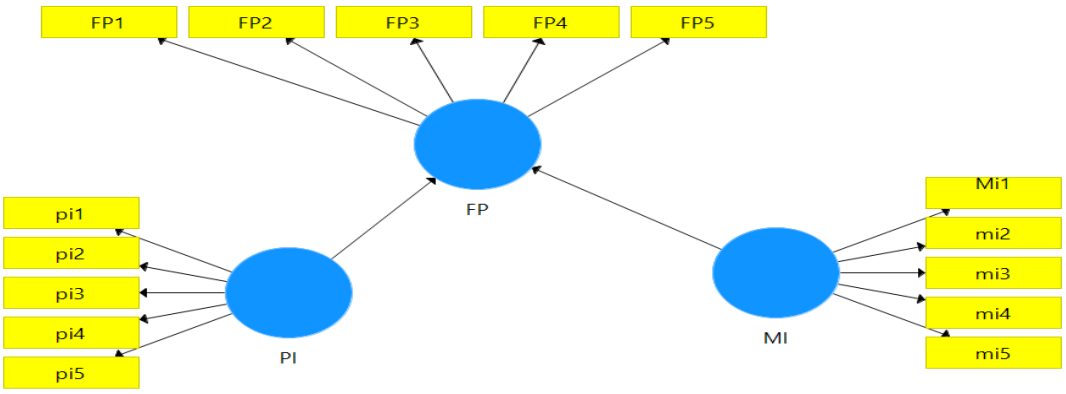
The study adopted the census sampling technique, which involves including the entire population in the study rather than selecting a subset. This approach was appropriate for the following reasons: Given that the total number of management employees (422) was manageable, a census approach ensured comprehensive data collection and minimized sampling error.

This study employed primary data collection through the use of a structured questionnaire. The questionnaire was designed to capture relevant information on product and market innovation and their effects on the performance of manufacturing firms in North-Eastern Nigeria. A five-point Likert scale ranging from "1 = Strongly Disagree" to "5 = Strongly Agree" was used to measure respondents' perceptions, experiences, and evaluations of innovation practices and performance outcomes.

The data gathered for the study was analyzed using partial least square of structural equation modeling (PLS-SEM). PLS-SEM was employed to evaluate the relationships between the variables under study, specifically assessing the effect of innovation (product and market innovation) on the performance of manufacturing firms in North-East Nigeria.

The analysis began with the Measurement Model Assessment, evaluating reliability using Cronbach's alpha and composite reliability (CR), with values above 0.70 indicating internal consistency. Convergent validity was confirmed through Average Variance Extracted (AVE) (values > 0.50), and discriminant validity was checked using the Fornell-Larcker criterion. Next, the Structural Model Assessment estimated path coefficients to assess relationships between Product Innovation (PI), Market Innovation (MI), and Firm Performance (FP), with R^2 values gauging predictive power and SRMR evaluating model fit (values < 0.08). Finally, bootstrapping with 5,000 resamples was conducted to ensure the robustness and statistical significance of the results.

Model specification



In this study, the relationship between Product Innovation (PI), Market Innovation (MI), and Firm Performance (FP) was examined using Partial Least Squares Structural Equation Modeling (PLS-SEM).
Product Innovation (PI) is measured by indicators such as new product development, improvement of existing products, and adoption of advanced technologies.
Market Innovation (MI) is measured by indicators like market expansion, new market entry, and customer relationship management strategies.
Firm Performance (FP) is assessed by indicators such as profitability, market share growth, and return on assets.

This specifies the relationships between the constructs, where PI and MI are the independent variables (exogenous), and FP is the dependent variable (endogenous). The model hypothesizes that PI and MI positively influence FP.

Result and Discussion

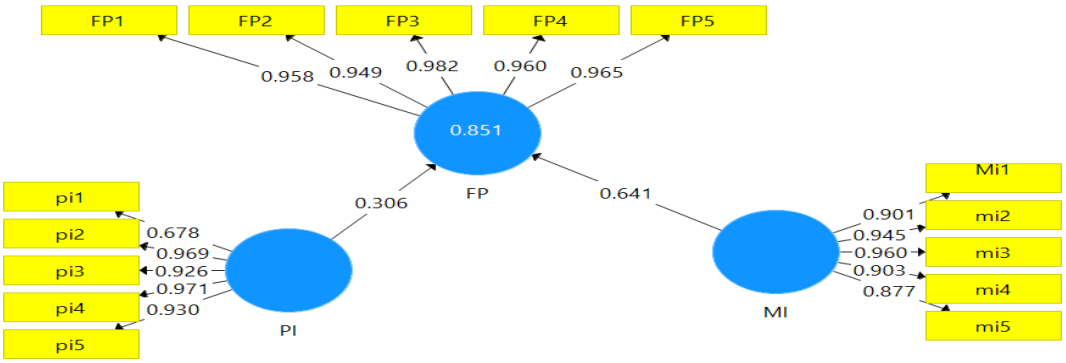


Figure 4.1 Measurement Model

Table4. 1 Construct Reliability and Validity

		item	CR	AVE
Financial performance	**FP1**	0.958	**0.985**	**0.927**
	FP2	0.949		
	FP3	0.982		
	FP4	0.960		
	FP5	0.965		
Product Innovation	**PI1**	**0.678**	**0.964**	**0.842**
	PI2	**0.969**		
	PI3	**0.926**		
	PI4	**0.971**		
	PI5	**0.93**		
Market Innovation	**MI1**	**0.901**	**0.955**	**0.813**
	MI2	**0.945**		
	MI3	**0.903**		
	MI4	**0.96**		
	MI5	**0.877**		

Table 4.1 shows that the constructs Financial Performance (FP), Product Innovation (PI), and Market Innovation (MI) demonstrate excellent reliability and convergent validity. The Composite Reliability (CR) values for all items exceed 0.7, indicating strong internal consistency. Specifically, FP has a CR ranging from 0.949 to 0.982, PI from 0.926 to 0.971, and MI from 0.877 to 0.960. The Average Variance Extracted (AVE) for each construct also exceeds the 0.50 threshold, with FP at 0.927, PI at 0.842, and MI at 0.813, confirming that the indicators adequately capture the variance in their respective constructs. These results confirm the measurement model's reliability and validity.

4.2 Table Discriminant Validity

	FP	**MI**	**PI**
FP	0.963		
MI	0.911	0.918	
PI	0.873	0.886	0.902

Table 4.2 shows the discriminant validity of the constructs—Financial Performance (FP), Market Innovation (MI), and Product Innovation (PI)—based on the Fornell-Larcker criterion. The square root of the Average Variance Extracted (AVE) for each construct is greater than its correlations with other

constructs: FP (0.963) is higher than its correlation with MI (0.911) and PI (0.873), MI (0.918) exceeds its correlation with FP (0.911) and PI (0.886), and PI (0.902) is greater than its correlation with FP (0.873) and MI (0.886). These results confirm that each construct is distinct from the others, demonstrating good discriminant validity.

4.3 R Square

	R Square	R Square Adjusted
FP	0.851	0.850

The R^2 value for Firm Performance (FP) is 0.851, indicating that 85.1% of the variance in firm performance is explained by the independent variables in the model. The Adjusted R^2 is 0.850, which accounts for the number of predictors in the model and provides a more accurate measure of the model's explanatory power.

Bootstrapping Analysis for Direct Relationship

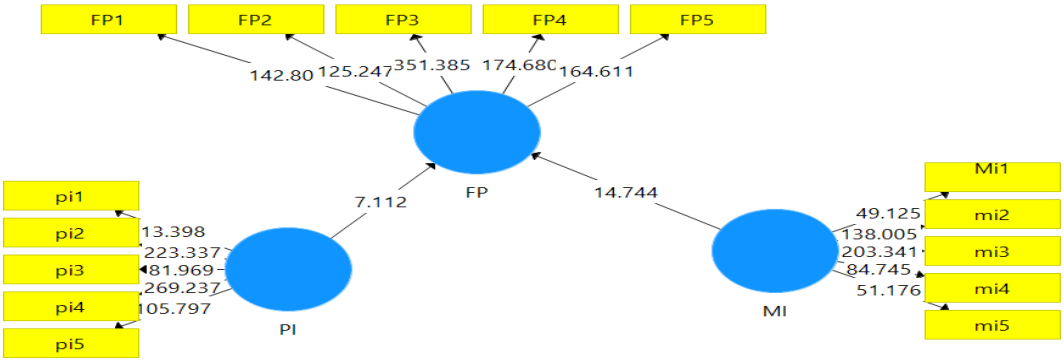


Fig 4.2 Structural Model of Direct Effects

Test of Hypotheses for Direct Relationships

	Beta	T Statistics	P Values
MI -> FP	0.641	14.744	**0.000**
PI -> FP	0.306	7.112	**0.000**

Hypothesis testing

H01: Product Innovation has positive effect on Performance in manufacturing firms in North East Nigeria. The positive beta value (0.306), high t-statistic (7.112), and significant p-value (0.000) indicate that product innovation has a significant positive effect on firm performance in the region.

H02: Market Innovation has positive effect on Performance in manufacturing firms in North East Nigeria. is also supported. The positive beta value (0.641), very high t-statistic (14.744), and significant p-value (0.000) demonstrate that market innovation has a significant positive effect on performance in manufacturing firms in North East Nigeria.

DISCUSSION OF FINDINGS

The study found a significant positive relationship between **product innovation** (PI) and **firm performance** (FP). This result aligns with Schumpeter's Theory of Innovation, which posits that new products or improvements to existing products drive competitive advantages and enhance firm performance. Specifically, the findings support the view that firms which adopt product innovations can differentiate themselves in the market, attract customers, and achieve higher profitability. This is consistent with previous studies like Ayinaddis (2023), which revealed that product innovation significantly impacts the performance of manufacturing firms, especially in the Ethiopian context.

Similarly, **market innovation** (MI) was found to have a positive impact on **firm performance** (FP), further corroborating Schumpeter's theory, which highlights the importance of innovation in marketing strategies. The findings suggest that firms that adopt new marketing strategies, such as new distribution channels or updated promotional tactics, experience growth in market share, customer satisfaction, and

overall profitability. This is in line with **Okundi and Muchemi (2022)**, whose study among SMEs in Kenya found a strong positive correlation between marketing innovation and entrepreneurial performance.

CONCLUSION AND RECOMMENDATIONS

This study set out to examine the impact of product innovation and market innovation on the firm performance of manufacturing firms in North East Nigeria. The findings confirm that product innovation and market innovation have a positive and significant effect on firm performance, The study's findings conclude innovation remains a key determinant of firm success in today's competitive environment. The manufacturing firms in North East Nigeria that embrace innovation, particularly in their products and marketing strategies, are more likely to experience improvements in their performance, including profitability, market share, and customer satisfaction.

Based on the findings of this study, the following recommendations are made:

i. Firms should prioritize investment in product innovation, as it has the most significant impact on firm performance. This could involve continuous research and development (R&D) to create new products or improve existing ones to meet evolving consumer needs.
ii. While product innovation has a stronger impact, market innovation is still crucial for sustained growth. Firms should adopt new marketing strategies, such as exploring new distribution channels, enhancing customer service, and utilizing digital platforms to engage with customers.

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Appendix

Product Innovation

1. The firm continuously develops new products to meet evolving customer needs.
2. Research and development (R&D) activities in the firm are focused on creating innovative products.
3. Product innovation is a core strategy in the firm's business operations.
4. The firm frequently improves the quality of existing products to maintain market competitiveness.
5. New product offerings have led to increased customer satisfaction in the firm. Market Innovation

1. The firm actively explores new distribution channels to reach a wider customer base.
2. Marketing strategies in the firm focus on innovating customer engagement and communication.
3. The firm has successfully entered new markets to expand its business operations.
4. Innovative advertising techniques are used to promote products to customers.
5. Market innovation has improved the firm's ability to attract and retain customers. Firm Performance

1. Profitability has improved as a result of implementing innovative practices in the firm.
2. The firm's market share has grown due to innovative product and marketing strategies.
3. Customer satisfaction levels have significantly increased due to innovation.
4. The firm's financial performance has shown consistent improvement due to product and market innovation.
5. The overall success of the firm is strongly linked to the ability to innovate in both products and marketing strategies.