New Product Development and Profitability of Manufacturing Firms in Nigeria: The Moderating Effect of Just-in-Time

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Abstract— It is not surprising that businesses adopt various techniques, business plans and strategies in order to make profits that enhance growth and expansion, and one of such strategies is corporate entrepreneurship. A corporate entrepreneurship strategy therefore, represents the directorial light and the motivating force for organisation as they try to sustain advantage in the marketplace. This study examined the effect of New Product Development and Profitability of manufacturing firms in Nigeria: The Moderating effect of Just-in-Time. Data for the study was obtained from primary source through the administration of a well-structured questionnaire. The sample size of this study was determined by using judgmental sampling technique in which 100 hundred manufacturing firms were selected based on the availability of up to date financial statement. A total of 100 copies of questionnaires were distributed and 100 questionnaires were returned. The data was subjected to series of cleansing to ensure reliability and validity. The study applied structural equation model, PLS-SEM. The findings of the structural model indicate that NPD has a large positive impact on profitability. Additionally, JIT has a considerable positive impact on profitability. However, the moderating effect of JIT between new product development and profitability is positive but not statistically significant. This study recommends that Hence, it is advisable for Managing Directors and Chief Executive Officers to apply the Just-In-Time (JIT) idea gradually over time, as it would effectively increase their profitability and decrease their inventory expenses.

Keywords— New Product Development, Profitability, Just-in-Time, Structural Equation Model, PLS-SEM, Moderation.

I. INTRODUCTION

Profitability is highly valued in the fields of management, finance, and accounting. Profitability is a crucial objective in financial management since it plays a significant role in maximising owners' wealth and is a key indicator of performance (Hifza 2011). An unprofitable enterprise cannot endure. A very lucrative firm can provide its owners with a substantial return on their investment. The primary objective of a business is to generate profit to ensure the longevity of the business in the current market environment.

A primary reason for this research is the necessity for all successful businesses, including those in the manufacturing sector, to generate profit in order to survive, grow, and advance. Profitability is essential for the sustainability of businesses. Businesses often utilise many methods, plans, and tactics to increase revenues and facilitate growth and expansion. Corporate entrepreneurship is one such strategy. A corporate entrepreneurship strategy serves as the guiding principle and driving factor for organisations as they strive to maintain a competitive edge in the market.

New product development (NPD) is as crucial as profitability for a company's survival and expansion (Hart, 1996). Creating and launching new items is essential for their longevity, but these activities can be expensive. The escalating rate of new product failure heightens the risk associated with new product development due to the high likelihood of significant financial losses. Therefore, organisations must comprehensively comprehend and control risks linked to the development of new goods. Organisations must continuously innovate to enhance their products and market share, since

establishing a strong process will be beneficial. By solely relying on traditional measures such as cost reduction to enhance competitiveness, it is unfeasible to sustain market presence. Consistent approach and innovative ideas are key components for a company's effective operation (Irena, Maris & Liene, 2016). For enterprises to stay lucrative and sustainable, they must continuously adapt to changes in theories, consumers, competitors, and technology by reviewing and updating the products and services they provide to the market. This necessitates the creation of innovative products and services to substitute existing ones. This study investigated how the introduction of new products impacts the profitability of manufacturing companies in Nigeria, with a focus on the moderating influence of Just-in-Time practices. Kinney and Wempe (2002) discovered that Just-In-Time (JIT) enhances Return on Assets (ROA) through increased profit margin and asset turnover. Cindy, Richard, and Cornelia (1999) ROI increases when the accounting management system is aligned with Just-In-Time (JIT) practices. Mia (2000) emphasised the need for a balance between the risks associated with JIT implementation and profitability indicators, such as enhanced income before interest, taxes, and depreciation (Callen, Morel, and Fader, 2003; Juarez, 2017).

Objectives

This study main objective is to examine the effect of new product development on profitability of quoted manufacturing companies in Nigeria with just-in-time as the moderator.
1. To determine the effect of New Product Development on the profitability of manufacturing companies in Nigeria.

2. To examine the effect of Just-in-Time on profitability of Nigeria manufacturing companies.
3. To investigate the moderating effect of Just-in-Time on the relationship between New Product Development and profitability of manufacturing companies in Nigeria.

Hypotheses

H_{01}: New Product Development has no effect on the profitability of manufacturing companies in Nigeria.

H_{02}: Just-in-Time has no effect on profitability of Nigeria manufacturing companies.

H_{03}: Just-in-Time does not moderate the relationship between New Product Development and profitability of manufacturing companies in Nigeria.

II. LITERATURE REVIEW

Concept of New Product Development

Kotler et al. (2018) described new product development as the process of creating a completely new product, refining existing products, modifying certain features, and introducing new variations of products or services by a company, driven by its efforts in new product development. The writers elaborated on how new product development adds value to customers and businesses' sales force, gratifying customers and increasing profitability for the firms that introduce the new product. In the 21st century economy, engaging in new product creation has become a significant avenue for organisations to achieve growth, productivity, and success (Kotler et al., 2018).

Chang and Taylor (2018) said that new product development involves using current technical tools to transform innovative product concepts into finished products that are easily accessible to buyers. It is the moment when new products are introduced to the market. Ansoff (1987) stated that new product development focuses on meeting the requirements and desires of current customers and seizing opportunities to expand into worldwide markets by following industrial trends. Sheperd and Ahmed (2000) analyse new product development by examining historical trends influenced by evolving marketing conceptions. The writers noted that recent new product developments have been influenced by the rapid pace of technical advancements. The main focus is on creating high-quality products that cater to customers' demands and desires both before and after the product is delivered.

David and colleagues (2015) suggested that despite the benefits of new product development, significant challenges such as high costs and risks can render extensive efforts, innovations, funds, and time invested in new product development futile. The author also mentioned that approximately 60% of new products or services introduced by top organisations tend to fail, with about two-thirds of these concepts never coming to fruition, as supported by documented facts.

Concept of Just in Time (JIT)

JIT is defined as maintaining the optimal level of inventory required at a specific point in time. A study conducted in the US between 1981 and 2000 revealed that manufacturing organisations with lower inventory levels in their warehouses

tend to be more efficient than those with higher inventory levels. Therefore, maintaining a moderate level of stock in the warehouse enables an organisation to save holding expenses, minimise setup costs, eliminate unnecessary lead time, and deliver products as per clients' orders. This allows an organisation to achieve total quality control (TQC) through efficient and effective supply chain management. JIT is an inventory management strategy focused on enhancing a company's financial performance by minimising surplus inventory and the related expenses (Sungard, 2007).

Implementing a JIT inventory system necessitates establishing a sustained and positive relationship with suppliers, as they are essential for providing inventory when it reaches a necessary minimum level. Robinson and Voss (1987) conducted a study that demonstrated how implementing JIT manufacturing procedures can lead to substantial benefits, particularly through zero defects programmes, which enhance overall quality assurance levels in the organisation.

JIT Objectives

The Just-in-Time system aims to achieve four main objectives: (1) timely production or delivery of goods for immediate sale, (2) timely production or delivery of subassemblies for final product assembly, (3) timely production or delivery of fabricated parts for subassembly creation, and (4) timely delivery of purchased materials for product construction (Roger, Cheng, and Podolsky 1996). Various strategies can be utilised to accomplish the specified end objectives. This study will concentrate on comparing push and pull strategies. The push technique involves the final stage of the manufacturing line triggering the withdrawal of necessary parts from preceding centres at specific moments. Employees will get the appropriate quantity of necessary parts to fulfil the request. Work centres provide parts to the final assembly line in sequence, and the manufacturer then replaces them. The need to use work-in-process stockroom to counteract lead times is removed, while ensuring safety stock or Economic Order Quantities are maintained (Phung 2011; Sihle & Sambil, 2018).

Just in Time as a Moderator

Heizer and Render (2014) defined Just-in-Time as the practice of having the precise quantity of inventory items delivered at the precise moment they are required. It is crucial to maintain the minimum inventory required in the organisation to ensure the continuous operation of the production line. Implementing this plan will enhance the company's efficiency and minimise waste, resulting in reduced inventory costs by ensuring commodities are delivered only when required in the production process. Harrison and Hoek (2011) defined Just-In-Time (JIT) as an inventory management strategy that reduces waste and enhances a company's quality.

Concept of Profitability

The main objective of trading business endeavours is profitability. Profitability is essential for the long-term survival of a business. It is crucial to assess present and historical profitability and forecast future profitability (Hofstrand, 2009). Profitability refers to the capacity to generate profit from the various business operations of an organisation, company, firm,

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or enterprise. It demonstrates the effectiveness of management in generating profit by utilising all available market resources.

Harward and Upton (1961) define profitability as the capacity of an investment to generate a return from its use. Nevertheless, 'Profitability' and 'Efficiency' are not interchangeable terms. Profitability is an indicator of efficiency and is considered a measure of efficiency and a management tool for achieving improved efficiency. Profitability is a crucial metric for assessing efficiency, but it should not be considered the definitive proof of efficiency. Occasionally, adequate earnings may indicate inefficiency, whereas a high level of efficiency may result in little profit. The net profit figure indicates a satisfactory equilibrium between the values received and values given. Operational efficiency is just one of the key aspects that significantly impact the profitability of a business. Additionally, profitability can be influenced by other factors beyond only efficiency.

Determinant of Company's Profitability

Sales: Sales play a crucial role in determining profitability. The return on sales ratio calculates post-tax profits relative to the sales of the current year. High sales statistics enhance a company's ability to navigate severe market conditions and economic downturns. The gross profit margin is a metric that indicates the gross profit generated from sales. An efficient sales strategy is crucial for boosting a company's profitability.

Pricing: Setting prices is crucial for deciding profit. Thorough study is essential for establishing the appropriate pricing plan for a company. Business owners should analyse competitors' pricing to establish optimal pricing strategies for maximising earnings. An essential aspect of pricing strategy is identifying the price point at which clients are willing to purchase a product. Consumers are willing to pay a premium for unique products or services that are not easily found elsewhere. A business owner aims to maximise profits by avoiding underpricing items and services. To achieve profitability, a company's income must surpass its expenses. Expenses are the expenditures related to the utilisation of resources in a business's operations. The company's profits are calculated by subtracting expenses from total sales. Implementing cost-saving techniques in a company will reduce expenses and enhance overall profitability.

Theoretical Review

This study is based on the Just-in-Time (JIT) theory. Just-in-Time (JIT) is a manufacturing concept created in Japan that emphasises simplicity, high quality, and efficient production. The approach is based on the Toyota Production System, which aims to completely eliminate waste and meet the demands of a dynamic market by delivering goods and services as required and in the necessary quantity. This method encourages production based on specific orders rather than producing goods for inventory. JIT production is a manufacturing system focused on reaching excellence by making continuous quality improvements, as described by Sugimori, Kusunoki, Cho, and Uchikawa in 1977. Rework and waste in manufacturing directly affect a company's earnings in terms of productivity (Schonberger, 1982). Tamura and Ej (2011) stated that business growth is directly related to profitability. This review seeks to

explain why organisations find financial benefits in adopting Just-In-Time (JIT) practices and the elements that are influenced to go beyond this assertion. Decreased inventory levels have led to enhancements as evidenced in several Just-In-Time (JIT) research. JIT has received both acclaim and censure for its efficacy, contributing to its somewhat cautious implementation. To satisfy shareholders' profit expectations, companies aim to find suppliers that provide competitive prices and offer a more efficient method of manufacturing products.

Empirical Review

Orji, Andah, Chima, & Boman (2017) studied how the development of new products affects the profitability of Nigerian Deposit Money Banks. The study was a survey inquiry. Primary and secondary data were utilised to assess developed hypotheses using the Kendall coefficient of concordance. The study discovered a correlation between new product creation and profitability in Nigerian deposit money banks. It was found that a lack of understanding of the advantages of new product innovation contributes to the low rate of profit maximisation in banks. New product innovations and developments originate from the bank's marketing research initiatives. Afolaranmi, Oduyoye, and Asikhia (2019). The study examined how new product development impacts competitive advantage in the food and beverages industry. The study utilised a survey research design. A sample size of 364 was chosen. A systematic questionnaire was utilised. The data collected were examined using correlation analysis. The study found a notable correlation between new product development and competitive advantage.

Eshiett and Eshiett (2022) assessed the relationship between new product development and organisational performance using the dynamic capability theory. A descriptive research methodology was used, involving the distribution of 302 questionnaires to staff, distribution intermediaries, and end users of products in Uyo, Akwa Ibom State, and Port Harcourt, Rivers State. Additionally, comprehensive interviews were conducted in areas where the questionnaire was insufficient. The study found a substantial correlation between New Product Development and organisational performance.

Nevien and Amr (2023) investigated the impact of implementing the just-in-time inventory model on the organisational effectiveness of Egyptian manufacturing businesses. This study expands the geographical scope by examining the correlation between inventory levels and organisational efficiency through Just-In-Time (JIT) in Egypt. It utilised questionnaires with a final sample size of 517 participants from Egyptian industrial businesses certified under ISO standards, operating in various sectors to assess inventory levels. The results showed that the level of inventory has a considerable impact on organisational effectiveness through the mediating role of Just-In-Time (JIT) inventory.

III. METHODOLOGY

Research design, sampling, and data collection.

The study used the positivist research paradigm, emphasising the use of quantitative research methods to investigate correlations and focus on causation (Ngah et al.,

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2021). An empirical analysis was performed to assess the causal relationship between exogenous and endogenous components. This study opted to use the quantitative research method. The study's sample size was determined using judicious sampling, selecting 100 manufacturing businesses based on the availability of recent financial records. One hundred surveys were distributed and all were returned, for a response rate of 100%. The multi-stage sampling methodology combines both probability and nonprobability sampling techniques. These two ways help carry out sampling in a sequential way. The study began by using a purposive sample technique, a form of non-probability sampling, to select the manufacturing sector as the specific area of focus. Simple random sampling was used to select respondents for the questionnaire in this study.

Measurement development.

The scale elements for new product development, just-in-time, and profitability were altered. The scale items are evaluated using a Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree), consistent with Rahi's (2017) previous study.

Common method bias.

This study utilises a single source to collect data. Therefore, bias may arise as a result of common procedure variance. Podsakoff and Organ (1986) propose that research using a single data source may lead to bias because of shared method variance. Hence, it is crucial to conduct a comprehensive investigation into the CMV-B issue. Procedural and statistical methods were utilised to assess the bias resulting from common method variance as described by Podsakoff and Organ in 1986. Harman's unifactorial solution analysis is utilised in statistical interventions. This study contends that the percentage of variance accounted for by the initial un-rotated factor should not surpass 40% (Cohen, 1988; Rahi, 2017; Yamin, 2019). Harman's unifactorial analysis showed that the primary factors explained only 16.378% of the variability, falling well below the 40% benchmark. This study has introduced procedural steps to reduce the impact of CMV-B. In procedural remedies surveys, the items were randomised before to data collection (Podsakoff et al., 2003). The measures have confirmed that CMV-B does not present a potential concern.

IV. DATA ANALYSIS AND RESULTS.

This study utilised a structural equation modelling (SEM) approach to examine the data. Structural equation modelling is a statistical method that estimates data through the combination of measurement and structural models (Rahi et al., 2018). There are two primary approaches to SEM estimation. There are two methods: the partial least squares structural equation modelling (PLS-SEM) and the covariance-based structural equation modelling (CB-SEM). Data analysis was performed via the Smart-PLS software.

Measurement model

Performing the measurement model involves ensuring reliability and discriminant validity of the constructs. The constructs have been validated for convergence. Construct validity was assessed by evaluating the Cronbach alpha (α) and

composite reliability (CR) values, with a threshold of ≥ 0.70 as recommended by Rahi et al. (2019). Convergent validity is confirmed when the average variance retrieved reaches or exceeds 0.50. The results of the measurement model are displayed in Table 1.

TABLE 1. Measurement model

Variable	Code	Loadings	CR	AVE
Just-in-Time	JIT6	0.785	0.749	0.507
	JIT7	0.531		
	JIT8	0.788		
New Product Development	NPD2	0.885	0.766	0.529
	NPD5	0.597		
	NPD6	0.668		
Profitability	PRO1	0.631	0.818	0.603
	PRO3	0.829		
	PRO5	0.851		

Note: CR – Composite Reliability = $(\Sigma\lambda)2 /(\Sigma\lambda)2+ \Sigma e$; AVE – Average Variance Extracted $=\Sigma\lambda2 / \Sigma\lambda2+\Sigma e$ and $e=1- \lambda2;2/df$ – Chi-Square Test Statistic /Degrees of Freedom. Sources: developed by the author.

The measuring model's results show that the constructs exhibit adequate construct reliability, discriminant validity, and convergent validity. The discriminant validity of the study model is evaluated by Fornell and Larcker analysis, following the methodology suggested by Fornell and Larcker (1981) and Yamin (2020). Fornell and Larcker (1981) argue that discriminant validity measures how distinct indicators are and evaluate different concepts. The Fornell and Larcker methodology determined discriminant validity by the calculation of average variance extracted (AVE) values. As per their standard, the square root of AVE must exceed the correlation between linked constructs (Fornell and Larcker, 1981). The analytical results from Fornell and Larcker are displayed in Table 2. The discriminant validity of the measure is effectively shown.

TABLE 2. Fornell and Larcker's analysis

	JIT	NPD	PRO
JIT	**0.712**		
NPD	0.104	**0.727**	
PRO	0.465	0.260	**0.777**

Note: JIT-Just-in-Time; NPD-New product development; PRO-Profitability
Sources: developed by the author.

Discriminant validity was evaluated by cross-loading analysis, following the method outlined by Ngah et al. (2021). Fornell and Larcker (1981) suggest that cross-loading is an alternative method for evaluating the discriminant validity of a measure and should be used consistently during data analysis. The cross-loading analysis indicates that the loadings of indicators should be higher than the loadings of other constructs to demonstrate discriminant validity (Fornell & Larcker, 1981). The results showed strong discriminant validity, with the construct's indicator scoring higher than those of other constructs. This suggests that the constructs possess sufficient discriminant validity. Table 3 shows the indication loadings.

The Heterotrait-Monotrait ratio approach (HTMT) was used to assess the discriminant validity of the measure (Gold et al., 2001; Rahi et al., 2021a; Sweiss and Yamin, 2020; Yamin, 2020b). Kline (2011) pioneered the HTMT approach. To achieve discriminant validity of the concepts, the HTMT ratio

should not surpass 0.85. Gold et al. (2001) suggested that a threshold value of ≤ 0.90 demonstrated satisfactory discriminant validity. The PLS analysis showed that the HTMT values were below the threshold of ≤0.85, confirming the construct's adequate discriminant validity. The results of the HTMT ratio analysis are presented in Table 4.

TABLE 3. Cross-loadings analysis

	JIT	NPD	PRO
JIT6	**0.785**	-0.053	0.369
JIT7	**0.531**	0.165	0.189
JIT8	**0.788**	0.157	0.390
NPD2	0.215	**0.885**	0.276
NPD5	-0.094	**0.597**	0.109
NPD6	-0.122	**0.668**	0.088
PRO1	0.255	0.379	**0.631**
PRO3	0.430	0.001	**0.829**
PRO5	0.391	0.218	**0.851**

Note: JIT-Just-in-Time; NPD-New product development; PRO-Profitability
Sources: developed by the author.

TABLE 4. Heterotrait-Monotrait Criterion

	JIT	NPD	PRO
JIT			
NPD	0.410		
PRO	0.752	0.418	

Note: JIT-Just-in-Time; NPD-New product development; PRO-Profitability
Sources: developed by the author.

Structural model assessment.

Structural model assessment includes evaluating the path coefficient, t-statistics, significance, and coefficient of determination (Hair et al., 2019; Rahi et al., 2021). The data was resampled with a synthetic dataset of 3000 observations to achieve results consistent with prior research by Yamin (2020). The results of the hypothesis testing may be found in Table 5.

TABLE 5. Hypotheses testing

Hypothesis	Relationship	Path Coefficient	STDEV	T-Statistics	Significance	Decision
H1	NPD -> PRO	0.252	0.124	2.038	0.042	Accepted
H2	JIT -> PRO	0.498	0.088	5.685	0.000	Accepted
H3	JIT x NPD -> PRO	0.145	0.118	1.231	0.218	Rejected

Note: STDEV – Standard Deviation.
Sources: developed by the author.

The structural model estimation indicated a significant influence of new product development on profitability. The route coefficient H1: β = 0.252 was statistically significant with a p-value greater than .042 and a t-statistic of 2.038. Just-in-Time (JIT) has positively impacted the company's profitability, as shown by the statistical study. The H2 coefficient for JIT is 0.498, statistically significant with a p-value greater than .000 and a t-statistic of 5.685. The results show that the moderating impact of Just-In-Time (JIT) on the relationship between new product development and profitability is positive, which goes against the hypothesis H3: β = 0.145 route, with a significance level of p < 0.218, and a t-statistic of 1.231.

The user refers to three statistical measures: the coefficient of determination (R2), effect magnitude (F2), and predictive

ability (Q2). To evaluate the impact of a causal relationship, effect size analysis is conducted and the coefficient of determination R2 is calculated to estimate the overall profitability of new product development and Just-in-Time. The study shows that profitability is impacted by new product development and just-in-time processes, as indicated by a modest R2 variation of 29.0%. The causal link is evaluated independently by effect size analysis f2. The impact size study results show that just-in-time has the highest predictive power, with a sizable effect size of 31.2%. Table 6 displays the coefficient determination and effect size analysis results for the constructs using the PLS approach. However, the efficacy of the components has not been assessed using blindfolding studies. Rahi et al. (2020) propose that evaluating a research framework involving several elements should prioritise analysing its predictive ability over just depending on the coefficient of determination. The predictive capacity is evaluated by blindfolding analysis Q2 as described by Rahi et al. (2020). The data were examined using a blindfolding technique. The results of the blindfolding study show that the research framework has a substantial prediction ability of 20.4% for evaluating profitability (Q2).

TABLE 6. Coefficient of determination (R^2), Effect size (f^2), and Blind folding (Q^2)

Factors	R^2	F^2	Q^2	Findings
New Product Development			0.084	Small
Just-in-Time			0.312	Medium
Profitability	0.290	0.204		

Sources: developed by the author.

The moderating analysis

The effects of Just-in-Time are evaluated through the product indicator approach. The study's findings show that Just-in-Time (JIT) positively moderates the relationship between new product development and profitability. The effect is not statistically significant with a beta coefficient of 0.145, p-value greater than 0.05, and t-statistic of 1.231. Figure 3 displays statistical values.

The study found that the impact of Just-In-Time (JIT) on profitability in the context of new product development is not statistically significant. The strength of the moderating analysis is evaluated by a simple slope analysis. Rahi et al. (2018) show that basic slope analysis offers a measure of the relationship's strength determined by the gradient. Therefore, it is crucial to include this aspect when conducting the moderation analysis. The analysis of the slope shows that Just-in-Time (JIT) is exhibiting a positive trend, with JIT being one standard deviation above the mean in a simple slope graph.

The Just-In-Time (JIT) analysis shows a negative deviation of one standard deviation (-1 SD) in a simple linear graph. The findings indicate that boosting Just-in-Time (JIT) will enhance the relationship between new product development and profitability. Figure 4 shows a graph depicting the examination of fundamental slopes.
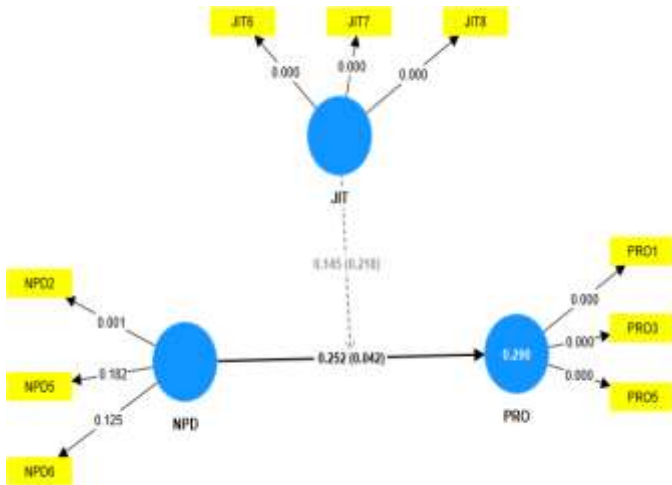
Figure 3. Moderating analysis
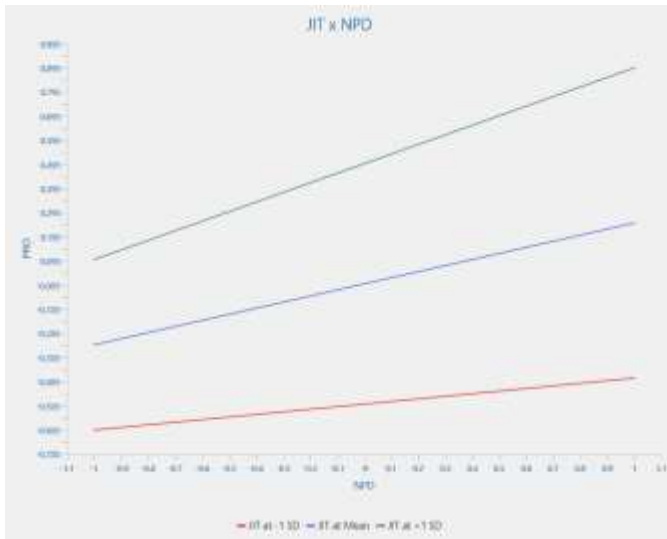Sources: developed by the authors.

Figure 4. The output of simple slope analysis Sources: developed by the authors.

V.   CONCLUSIONS

This study investigates the correlation between New Product Development and Profitability in manufacturing companies in Nigeria, specifically analysing the moderating impact of Just-in-Time. This study was conducted due to the increasing production costs and storage management issues that have negatively affected the profitability of manufacturing companies in Nigeria. This study aims to examine how Just-in-Time (JIT) impacts the decreasing profitability trend in manufacturing firms. Empirical studies have shown that the integration of new product development and just-in-time procedures contributed to a substantial share (29.0%) of the variation in profitability. The blindfolded evaluation showed that the research framework had a predictive power of 20.4% for measuring the profitability of the organisation, referred to as Q^2.

The structural model's findings show that NPD has a significant beneficial effect on profitability. JIT also significantly enhances profitability. The interaction of JIT between new product development and profitability is positively related, although lacks statistical significance. Managing Directors and Chief Executive Officers should gradually use the Just-In-Time (JIT) concept to enhance profitability and reduce inventory costs.

VI.   RESEARCH LIMITATIONS AND FUTURE DIRECTION

New product development (NPD) significantly enhances profitability, while just-in-time (JIT) has a substantial effect on profitability. JIT has a favourable but insignificant moderating impact on the connection between NPD and profitability. The findings provided interesting insights, but it is crucial to interpret the results cautiously. This study lacks a thorough examination of all factors influencing a company's profitability. Researchers and practitioners need to focus on factors like innovation and risk-taking.

This study is limited by the use of a cross-sectional research methodology, which involves collecting data at a certain moment in time. Future researchers could consider examining the current study methodology utilising a longitudinal approach to reveal more fascinating discoveries. This study is designed and carried out within the positivist paradigm. Structured questionnaires were used to collect data. However, including interviews with managers to provide a firsthand perspective could enhance the relevance of this study. Future researchers should conduct tests on the current research model utilising a mixed mode method to assess the influence of integrated aspects on profitability within the framework of Just-in-Time (JIT) practices.

REFERENCE

[1]. Afolaranmi, O. M., Oduyoye, O. O.& Asikhia, O. U (2019). New product development and competitive advantage of selected companies in the food and beverages industry in Lagos State, Nigeria. *International Journal of Advanced Research in Statistics Management and Finance* 7(1), 158-166.

[2]. Ansoff, I. (1987). Conceptual underpinnings of systematic strategic management. *European Journal of Operational Research*, 19(1), 2-19, https://ideas.repec.org/a/eee/ejores/v19y1985i1p2-19.html

[3]. Callen, J. L., Morel, M., & Fader, C., (2003). The profitability-risk tradeoff of Just-in-time manufacturing technologies. *Manage Dec Econ, 24*(5), 393-402.

[4]. Chang, W., & Taylor, S. A. (2018). The effectiveness of customer participation in new product development: A meta-analysis. *Journal of Marketing*, *80*(1), 47-64. https://doi.org/10.1509/jm.14.0057

[5]. Cindy, C., Richard, G., & Cornelia, D., (1999). Total system JIT outcomes: Inventory, organization and financial effects. *I J Phys Dist Logist Manage, 29*(10), 612-630. doi:10.1108/09600039910299940

[6]. Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* Mahwah, NJ: Lawrence Erlbaum.

[7]. David, M., Edward, C. L., & Samrat, S. (2015). Creating what consumers want. *Forbes,* www.forbes. com/sites/strategyand/2015/01/26/creating-what-consumers-want/

[8]. Eshiett, I. O., & Eshiett, O. E. (2022). New product development and organizational performance in Nigeria. Problems of Management in the 21st Century, 17(1), 8-24. https://doi.org/10.33225/pmc/22.17.08

[9]. Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, 382-388.

[10]. Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. *Journal of management information systems*, *18*(1), 185-214.

[11]. Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. (2010). Multivariate Data Analysis: Pearson Education. *Upper Saddle River, New Jersey*.

[12]. Hart, S. (Ed.) (1996), *New Product Development: A Reader,* The Dryden Press, London.

[13]. Hifza, M. (2011). Determinants of Insurance Companies Profitability: An Analysis of Insurance Sector of Pakistan. Academic Research International, 1(3)

[14]. Hofstrand, D.(2009). Understanding profitability. *www.extension.iastate.edu*

[15]. Irena, S., Maris, I., & Liene, A-S. (2016). Research of the new product development process. *Journal of Social Science, 1*(8).

[16]. Juarez, F. (2017). Linking just in time to financial statements profitability analysis based on duality properties. *International Journal of Applied Engineering Research, 12*(24), 14307-14313

[17]. Kinney, M. R., & Wempe, W. F., (2002). Further evidence on the extent and origins of JIT's Profitability Effects. *Account Rev, 77*(1), 203-225.

[18]. Kline, R. B. (2011). Principles and Practice for Structural Equation Modelling (3rd Eds).

[19]. Kootanaee, A.J., Babu, K.N., & Talari, H.F. (2013). Just-in-Time manufacturing system: From introduction to implement, *1*(2), 20-25.

[20]. Kotler, P., Armstrong, G., & Opresnik, M. O. (2018). *Principles* of *marketing* (17th ed.). Pearson.

[21]. Mia, L., (2000). Just-in-time manufacturing, management accounting systems and profitability, *Account Bus Res, 30*(2), 137-151.

[22]. Nevien, F. K., & Amr, Y. (2023). Testing the just-in-time inventory model effect on organizational effectiveness for Egyptian manufacturing industries. *Arab Journal of Administration*, 45(3), 1-18

[23]. Ngah, A. H., Gabarre, S., Han, H., Rahi, S., Al-Gasawneh, J. A., & Park, S. H. (2021). Intention to purchase halal cosmetics: do males and females differ? A multigroup analysis. *Cosmetics, 8*(1), 19.

[24]. Orji, M.G., Andah, R., Chima, K., & Boman, A.S. (2017). Impact of new products development on the profitability of Nigerian Deposit Money Banks. *International Journal of Economics, Finance and Management Sciences, 5*(4), 213-221. doi: 10.11648/j.ijefm.20170504.12

[25]. Phung, O.J. (2011). *The impact of just-in-time inventory systems on small businesses. Journal of Accountancy*, 46.

[26]. Podsakoff, P. M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and

[27]. prospects. *Journal of management, 12*(4), 531-544.

[28]. Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology, 88*(5), 879.

[29]. Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences*, 6(2), 1-5.

[30]. Rahi, S., Ghani, M., & Ngah, A. (2018). A structural equation model for evaluating user's intention to adopt internet banking and intention to recommend technology. *Accounting, 4*(4), 139-152.

[31]. Rahi, S., Ghani, M. A., & Ngah, A. H. (2019). Integration of unified theory of acceptance and use of technology in internet banking adoption setting: Evidence from Pakistan. *Technology in Society*, 58, 101120.

[32]. Rahi, S., Khan, M. M., & Alghizzawi, M. (2021). Factors influencing the adoption of telemedicine health services during COVID-19 pandemic crisis: an integrative research model. *Enterprise Information Systems*, *15*(6), 769-793.

[33]. Robinsons, S.J& Voss C,A. (1987)The applicationg of just-in-time manufctruring techniques in the United Kingdom. *International journals of operations and production management ,7 (4), 46-52*

[34]. Schonberger, R.J. (1982). *Japanese manufacturing techniques: Nine hidden lessons in simplicity.* New York: Free Press.

[35]. Sheperd, C., & Ahmed, P. K. (2000). From product innovation to solutions innovation: A new paradigm for competitive advantage. *European Journal of Innovation Management, 3*(2), 100-106. https://doi.org/10.1108/14601060010322293

[36]. Sihle, M., & Sambil, C.M. (2018). The impact of just-in-time (JIT) in inventory management system and the supplier overall performance of South African's Bed Mattress Manufacturing Companies. *Proceedings of the International Conference on Industrial Engineering and Operations Management* 239-249

[37]. Sugimori, Y., Kusunoki, K., Cho, F., & Uchikawa, S. (1977). Toyota production system and kanban system: Materialisation of just-in-time and respect for human systems, *International Journal of Production Research*, 15(6), 553-564.

[38]. Sungard, (2007), Information Resiliency for a JIT world, Retrieved Jan. 29, 2024.

[39]. Sweiss, M. I. K., & Yamin, M. A. Y. (2020). The influence of organisational and individual factors on organisational innovation with moderating role of innovation orientation. *International Journal of Business Innovation and Research, 23*(1), 103-126.

[40]. Tamura, T. & Ej.O.K. (2011). *Journal of International Production Research*, 49(14), 4299-4315.

[41]. Yamin, M. A. Y. (2020). The relationship between right ethical behavior perspective, demographic factors, and best ethical performance. *International Review of Management and Marketing, 10*(1), 27-39.

[42]. Yamin, M. A. Y. (2019). The mediating role of ethical organisational climate between HRM practices and HR outcomes in public sector of Saudi Arabia. *International Journal of Business Excellence, 19*(4), 557-573.