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EFFECT OF RESEARCH AND DEVELOPMENT ON VALUE CREATION: EVIDENCE FROM LISTED CONSUMER GOODS FIRMS IN NIGERIA

Ogochukwu Nkiru Onyeogubalu

Department of Accountancy, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

Abstract

The study examined the effect of research and development (R&D) on value creation among listed consumer goods firms in Nigeria. Population consisted of 20 listed consumer goods firms on the Nigerian Exchange Group, from which 15 firms were purposively selected as the sample. Data that spanned from 2012–2024 were collected entirely from audited annual reports and financial statements of the sampled firms. Panel Estimated Generalised Least Square (EGLS) was used in analyzing data. The finding revealed that R&D expenditure has a significant positive effect on value added of listed consumer goods firms in Nigeria (β = 2.7859; p = 0.0060). The study concluded that R&D spending plays a vital role in enhancing the productive capacity of firms by enabling them to transform inputs into outputs that generate additional wealth. The study recommended management of listed consumer goods firms should allocate a dedicated portion of their annual budgets to research and development projects.

Keywords: Research and Development, Value Creation, Consumer Goods Firms, Value Added

1. Introduction

Business organizations across the world continue to face growing competition, rapid technological changes, and the pressure to improve their performance in order to survive and grow. In Nigeria, the consumer goods sector is one of the most vibrant segments of the economy, contributing significantly to employment, government revenue, and national output (Adedoyin et al., 2024). One of the major ways companies sustain themselves and stand out in a competitive marketplace is through value creation (Muojekwu et al., 2025). Value creation has gained increasing relevance in today's business environment because it reflects how firms use their resources to generate benefits that go beyond short-term profitability (Saidia et al., 2021).

Research and development (R&D) is one of the most effective tools that firms use to support value creation. Through R&D, firms are able to increase efficiency, reduce costs, and enhance the quality of their products. In the Nigerian consumer goods sector, where economic conditions such as inflation, foreign exchange fluctuations, and competition from imported goods pose significant challenges, R&D can serve as a pathway to resilience and sustainability (Uyar et al., 2023). Research and development directly affects value creation by providing firms with the tools to respond to the changing demands of customers and the challenges of competition. Firms that invest in R&D are more likely to develop innovative products that meet consumer preferences, thereby increasing customer satisfaction and loyalty (Okoronkwo et al., 2021). Evidence from other regions suggests, however, that the payoff from R&D depends on the time horizon and the context in which it is measured: among U.S. firms, higher R&D intensity tends to depress profitability in the short run while supporting capital market performance over time (Karna et al., 2022), and in China the relationship between R&D and firm value has been found to be non-linear (Kim et al., 2018).

In Nigeria, however, many consumer goods firms either allocate very little to research and development or fail to account for it clearly in their financial reports. This limited commitment to research and development reduces the ability of firms to create lasting value. The absence of strong innovation-driven strategies also affects their capacity to generate higher levels of value added, which is a key indicator of long-term performance and contribution to the economy.

From the review of existing studies, it is clear that research and development has been examined from different perspectives across sectors, but important gaps remain. Owota and Mansi (2025) studied oil and gas companies, Uyar et al. (2023) focused on energy firms, Khalifa (2023) investigated manufacturing firms in Tunisia, while Rahman and Howlader (2022), Amos et al. (2022), Anidebe et al. (2021), Okoronkwo et al. (2021), Uwah and Akinninyi (2020), and Didia and Nadube (2016) examined R&D across different sectors. Although these studies provided useful findings, most of them concentrated on general measures of firm value such as market value, stock prices, earnings per share, or Tobin's Q, rather than focusing on firm value added as an outcome of R&D. In addition, they generally applied traditional estimation techniques such as OLS, pooled regression, or simple panel

models without addressing econometric problems. The reviewed studies did not identify the application of Panel Estimated Generalised Least Squares (EGLS), which corrects for cross-sectional dependence and heteroskedasticity, thereby improving the reliability of results. Studies from the United States (Karna et al., 2022; Sulimany, 2025), Europe (Doni & Fiameni, 2024) and Asia (Hutauruk, 2024; Khan et al., 2023; Kim et al., 2018) have likewise measured the returns to R&D mainly through profitability, financial sustainability, stock returns, or market valuation, while evidence from Africa beyond Nigeria remains limited and has centred on the determinants of R&D and on innovation and listed-firm performance (Kahn et al., 2024; Shibia, 2023; Totowa & Godspower-Akpomiemie, 2024). This leaves a gap that the present study fills by specifically examining the effect of R&D expenditure on firm value added of listed consumer goods firms in Nigeria using Panel EGLS over the period 2012–2024.

1.1 Objective of the study

The main aim of the study is to examine the effect of research and development on value creation among the listed consumer goods firms in Nigeria. The specific objective of the study is to:

(i) Ascertain the effect of research and development expenditure on the value added of listed consumer goods firms in Nigeria.

1.2 Research hypothesis

The researcher hypothesized the following null statement for this study:

H_{01}: The effect of research and development expenditure on the value added of listed consumer goods firms in Nigeria is not significant.

2. Literature Review

2.1 Conceptual Review

2.1.1 Research and Development

Research and development (R&D) refers to activities undertaken by firms to generate knowledge and apply it to the development of new or improved products, services, and production processes (Uyar et al., 2023). It enables organisations to improve existing operations while exploring opportunities for innovation and competitive advantage (Anidebe et al., 2021). R&D therefore involves not only generating new ideas but also testing, refining, and applying those ideas to practical business activities (Owota & Mansi, 2025). For consumer goods firms, R&D may involve developing new products, improving existing products, enhancing production processes, reducing costs, and responding to changing consumer preferences. Through these activities, firms can improve efficiency, product quality, and market competitiveness. R&D can therefore serve as an important mechanism for continuous improvement and long-term growth. In this study, R&D expenditure represents the financial commitment of listed consumer goods firms to these activities and is examined in relation to value added

2.1.2 Value Creation

Value creation refers to the process through which firms transform their resources and capabilities into outcomes that benefit stakeholders and support continued business development (Muojekwu et al., 2025). Although profitability is an important aspect of value creation, the concept extends to benefits generated for customers, investors, employees, and the wider economy. Effective utilisation of organisational resources can enable firms to develop valuable products and services while strengthening their market position (Lüdeke-Freund et al., 2020). In the consumer goods sector, value creation may result from improved product quality, production efficiency, innovation, cost management, and responsiveness to market needs. These activities can enhance customer satisfaction while improving the firm's economic performance and long-term competitiveness (Okoye et al., 2024). In this study, value creation is measured through value added, which provides a measurable indication of the economic value generated by the sampled firms.

2.1.3 Value Added

Value added represents the additional economic value generated by a firm through the transformation of inputs into goods and services. It reflects the increase in economic worth created during production after accounting for the resources consumed in generating output (Nandi, 2011). For consumer goods firms, value added arises from transforming raw materials and other inputs into finished products with greater economic

value (Oshodi, 2022). Value added also reflects the firm's contribution to wider economic activity. The value generated through business operations can support employee income, investor returns, government revenue, and economic development (Adeyemo & Okoruwa, 2018). It therefore provides a useful measure of the economic value generated by a firm beyond conventional profitability measures. For this study, value added is adopted as the measure of value creation because it captures the economic value generated by listed consumer goods firms. Examining its relationship with R&D expenditure provides a basis for determining whether investment in research and development contributes to measurable improvements in the value generated by these firms.

2.2 Theoretical Framework

The Schumpeterian Innovation Theory was developed by the Austrian economist Joseph Schumpeter in 1911 and further popularized in his later works during the 1930s and 1940s (Nworie et al., 2025). Schumpeter introduced the idea that innovation is the primary driver of economic development and business growth. He argued that firms do not grow solely by competing on existing products or processes but by creating new combinations of resources that lead to novel products, improved methods of production, or entirely new markets.

The main postulation of the Schumpeterian Innovation Theory is that economic progress is achieved through "creative destruction," a process where new innovations disrupt and replace outdated technologies, products, and business models (Terkura et al., 2025). According to Schumpeter, firms that invest in research and development gain the ability to innovate, thereby driving competition and long-term growth. The relevance of this theory to the present study lies in its explanation of how research and development contributes to value creation. By linking R&D expenditure to value added, the study applies Schumpeter's idea that innovation is a source of firm value.

2.3 Empirical Review

Owota and Mansi (2025) examined how Research and Development (R&D) affects the value of oil and gas companies in Nigeria. Results indicate that R&D expenditures do not have a significant impact on firm value in Nigeria's oil and gas sector.

Sulimany (2025) analyzed 231 firms in the S&P 500 index between 2015 and 2022 using fixed effects and the generalised method of moments, and reported that R&D expenditure is positively associated with financial sustainability, a result consistent with signalling theory.

Hutauruk (2024) studied palm oil firms listed on the Indonesia Stock Exchange between 2019 and 2022 and found that R&D expenditure has a positive and significant effect on firm value, with firm size influencing the relationship.

Totowa and Godspower-Akpomiemie (2024) applied the generalised method of moments to firms listed on the Johannesburg Stock Exchange between 2007 and 2021 and found that the acquisition of patents and licences (secondary innovation), an alternative route for firms that cannot invest in R&D, improves firm performance, although government innovation policies were found to hamper performance.

Doni and Fiameni (2024) studied companies in the STOXX 200 index and examined the role of R&D investment in the relationship between environmental, social and governance policies and financial performance; the positive associations they report were concentrated among high-innovation firms.

Kahn et al. (2024) analyzed the micro- and macro-economic determinants of firm-level R&D intensity in the South African business sector using national R&D survey data for 200 to 2017.

Shibia (2023) found that access to external finance, export participation, larger firm size and operation in high-technology subsectors increase the likelihood that Kenyan manufacturing firms undertake R&D.

Uyar et al. (2023) investigated the link between R&D intensity, environmentally friendly practices, firm value, and stakeholder environmental concerns in the energy sector. They found that R&D intensity promotes eco-friendly practices and that strong environmental performance is associated with higher firm value. Moderation analysis indicated that R&D combined with eco-innovation enhances value.

Khalifa (2023) explored the interplay between R&D, information and communication technology (ICT), product and process innovations, and firm productivity in manufacturing firms in Tunisia. The study revealed that R&D significantly predicts product innovation but not process innovation. R&D and ICT also indirectly boost productivity through innovation.

Khan et al. (2023) found that R&D spending is negatively associated with firm performance measured by return on equity, and that this adverse effect is weaker for state-owned enterprises.

Rahman and Howlader (2022) examined the impact of R&D spending on firm performance and value in an emerging economy. The results consistently showed a significant positive relationship between R&D expenditure and both firm performance and value.

Karna et al. (2022) applied panel vector autoregression to a sample of 6,623 U.S. firms over the period 1990–2020 and found that increases in R&D intensity reduce profitability in the short term, although this effect fades relatively quickly, whereas the effect on capital market performance is positive and persistent.

Amos et al. (2022) investigated how research and development (R&D) influences the market value of listed manufacturing firms in Nigeria. The findings indicate that R&D has a significant positive impact on market value.

Anidebe et al. (2021) examined the effect of R&D expenditures on the value of industrial goods companies listed on the Nigerian Stock Exchange. Results revealed that R&D expenditures did not significantly affect firm value.

Okoronkwo et al. (2021) assessed the impact of R&D on the competitiveness of selected manufacturing SMEs in Lagos State, Nigeria. Findings revealed that R&D significantly enhances competitiveness ($\beta = 0.342$, $t = 7.838$, $p < 0.05$), confirming its positive role in SME performance.

Uwah and Akinninyi (2020) explored the relationship between R&D and economic value added (EVA) in Nigerian manufacturing companies. The results indicated a significant positive relationship between R&D and EVA.

Kim et al. (2018) examined whether R&D investments are non-linearly related to firm value in China and documented an inverted U-shaped relationship. Using a large sample of Chinese listed firms.

Didia and Nadube (2016) examined the relationship between R&D integration and business performance in the Nigerian telecommunications industry. Results showed a clear association between R&D integration and key business performance indicators, including sales growth and market share.

Taken together, the international evidence suggests that R&D generally enhances value over the long run, but that the size and even the sign of the effect depend on the performance measure, the time horizon and the institutional context. This reinforces the need for country- and sector-specific evidence, such as that provided in the present study for the Nigerian consumer goods sector.

3. Methodology

This study adopted an ex-post facto research design to investigate the effect of research and development (R&D) on value creation among listed consumer goods firms in Nigeria. The population of the study comprises all listed consumer goods firms on the Nigerian Exchange Group (NGX) as of December 31, 2024. A total of twenty (20) firms fall into this category. A purposive sampling technique was adopted, and fifteen (15) firms were selected based on the availability of complete and reliable financial statements containing information on R&D expenditure between 2012 and 2024.

Table 3.1: Population of the Study (Consumer Goods Firms)

S/N	Firm	S/N	Firm
1	Bua Foods Plc	11	Multi-Trex Integrated Foods Plc
2	Cadbury Nigeria Plc.	12	N Nig. Flour Mills Plc.
3	Champion Brew. Plc.	13	Nascon Allied Industries Plc
4	Dangote Sugar Refinery Plc	14	Nestle Nigeria Plc.
5	Dn Tyre & Rubber Plc	15	Nigerian Brew. Plc.
6	Golden Guinea Brew. Plc.	16	Nigerian Enamelware Plc.
7	Guinness Nig Plc	17	P Z Cussons Nigeria Plc.
8	Honeywell Flour Mill Plc	18	Unilever Nigeria Plc.
9	International Breweries Plc.	19	Union Dicon Salt Plc.
10	Mcnichols Plc	20	Vitafoam Nig Plc.

(Source: Nigerian Exchange Group, 2024)

A purposive sampling technique was adopted to include only firms that consistently published complete and reliable financial statements containing information on R&D expenditure between 2012 and 2024. Based on this criterion, a final sample of fifteen (15) firms was selected, representing a balanced subset of the consumer goods sector.

Table 3.2: Sample Size

S/N	Firm	S/N	Firm
1	Cadbury Nigeria Plc.	9	Nestle Nigeria Plc.
2	Champion Brew. Plc.	10	Nigerian Brew. Plc.
3	Dangote Sugar Refinery Plc	11	Nigerian Enamelware Plc.
4	Guinness Nig Plc	12	P Z Cussons Nigeria Plc.
5	Honeywell Flour Mill Plc	13	Unilever Nigeria Plc.
6	International Breweries Plc.	14	Union Dicon Salt Plc.
7	N Nig. Flour Mills Plc.	15	Vitafoam Nig Plc.
8	Nascon Allied Industries Plc		

(Source: Researcher's Compilation, 2025)

The study relied entirely on secondary data obtained from audited annual reports and financial statements of the sampled firms covering the period 2012–2024. These reports were accessed from the Nigerian Exchange Group (NGX), firms' official websites, and related financial databases. The data were analyzed using descriptive statistics, while Panel Estimated Generalised Least Square (Panel EGLS) was employed to examine the effect of R&D expenditure on value added of listed consumer goods firms. Diagnostic tests such as heteroskedasticity and cross-sectional dependence were conducted to ensure the validity of the regression results. Hypotheses were tested at a 5% level of significance.

This study adapted the model of Anidebe et al. (2021), who examined the nexus between R&D and value creation. The functional form of the model is:

$$VAC_{it} = \beta_0 + \beta_1 RDE_{it} + \beta_2 TA_{it} + \mu_{it} \quad (1)$$

Where:

VAC_{it} = Value added of firm i at time t

RDE_{it} = R&D expenditure of firm i at time t

TA_{it} = Total assets of firm i at time t (control variable)

β_0 = Intercept

β_1, β_2 = Coefficients of independent and control variables

μ_{it} = Error term

i = Firm index

t = Year index (2012–2024)

Table 3.3: Operationalization of Variables

Variable	Measurement/Proxy	Source
Value Added (VA)	Total Value Added reported in firms' financial statements	Nandi, 2011
R&D Expenditure (RDE)	Annual R&D expenditure	Anidebe et al., 2021
Total Asset	The value of total asset owned by the firm at the year end	Juárez, 2018

(Source: Researcher's Compilation, 2025)

4. Data Analysis and Findings

4.1 Descriptive Analysis and Model Diagnostics

The study examined the effect of research and development (R&D) on value creation among listed consumer goods firms in Nigeria, with the specific objective of determining the effect of R&D expenditure on the value added of these firms. The study adopted an ex-post facto research design using already published financial data without manipulating variables. The population consisted of 20 listed consumer goods firms on the Nigerian Exchange Group, from which 15 firms were purposively selected as the sample. Data were collected from audited annual reports and financial statements of the sampled firms covering the period 2012–2024.

Table 4.1: Descriptive Analysis

	Value Added (₦'000)	Research and Development (₦'000)	Total Asset (₦'000)
Mean	27058952	37991.39	125015194
Median	9890674	0.000000	50172484
Maximum	406384048	906000.0	1126267553
Minimum	-90789645	0.000000	57287.00
Std. Dev.	47620990	115537.8	188198886
Skewness	3.445605	4.096095	2.664282
Kurtosis	23.46120	22.87400	11.09561
Jarque-Bera	3787.463	3754.463	763.2021
Probability	0.000000	0.000000	0.000000

Source: Eviews 10 Output (2025)

Table 4.1 shows that the value added of listed consumer goods firms in Nigeria recorded a mean of ₦27,058,952,000, maximum of ₦406,384,048,000, minimum of –₦90,789,645,000, and standard deviation of ₦47,620,990,000. The skewness of 3.45 and kurtosis of 23.46 reveal that the distribution of value added is heavily skewed to the right and sharply peaked, while the Jarque-Bera probability of 0.000 confirms that the distribution is not normal.

Table 4.1 also shows that research and development expenditure averaged ₦37,991,390, with a maximum of ₦906,000,000, minimum of zero, and standard deviation of ₦115,537,800. The skewness of 4.10 and kurtosis of 22.87 confirm that the distribution is strongly skewed with a sharp peak, while the Jarque-Bera probability of 0.000 suggests non-normality.

Table 4.1 further indicates that the total assets of the sampled firms had a mean of ₦125,015,194,000, maximum of ₦1,126,267,553,000, minimum of ₦57,287,000, and standard deviation of ₦188,198,886,000. The skewness of 2.66 and kurtosis of 11.10 imply that the distribution is positively skewed and leptokurtic, while the Jarque-Bera probability of 0.000 shows that the distribution of total assets deviates from normality.

Table 4.2: Model Diagnostics

Test	Statistic	Probability
Residual Cross-Section Dependence Test: Breusch-Pagan LM	287.8917	0.0000
Panel Cross-Section Heteroskedasticity LR Test: Likelihood Ratio	627.8049	0.0000
Hausman Test	8.601528	0.0136

Source: Eviews 10 Output (2025)

Table 4.2 presents the result of the Breusch-Pagan LM residual cross-section dependence test. The test produced a statistic of 287.8917 with a probability of 0.0000, indicating the presence of cross-sectional dependence in the model.

Table 4.2 also reports the result of the Panel Cross-Section Heteroskedasticity Likelihood Ratio test. The test returned a statistic of 627.8049 with a probability of 0.0000, confirming the presence of heteroskedasticity in the panel dataset.

Table 4.2 further shows the outcome of the Hausman test. The test produced a statistic of 8.601528 with a probability of 0.0136, which is statistically significant at the 5 percent level. This result supports the adoption of the fixed effects model.

4.2 Test of Hypothesis

H_0: Research and development expenditure has no significant effect on the value added of listed consumer goods firms in Nigeria.

Panel Estimated Generalised Least Squares (EGLS) was employed to test the hypotheses in order to correct for heteroskedasticity and cross-sectional dependence in the data.

Table 4.3: Test of Hypothesis

Dependent Variable: VALUE ADDED				
Method	Panel EGLS (Cross-section weights)			
Date / Time	09/11/25 02:21			
Sample	2012–2024			
Periods included	13			
Cross-sections included	15			
Total panel (balanced) observations	195			
Estimation	Linear estimation after one-step weighting matrix			
Standard errors	Cross-section weights (PCSE) standard errors & covariance (d.f. corrected)			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Research and Development	2.785866	1.001880	2.780639	0.0060
Total Asset	0.099122	0.011799	8.400593	0.0000
C	14561315	1474719	9.873956	0.0000
Effects Specification: Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.810131	Mean dependent var		49828929
Adjusted R-squared	0.793064	S.D. dependent var		45729297
S.E. of regression	29950788	Sum squared resid		1.60E+17
F-statistic	47.46808	Durbin-Watson stat		1.164774
Prob(F-statistic)	0.000000			

Source: Eviews 10 Output (2025)

Table 4.3 shows the test of hypothesis using Panel EGLS estimation with cross-section weights, which was employed to correct for heteroskedasticity and cross-sectional dependence. The adjusted R-squared is 0.7931, indicating that about 79 percent of the variation in value added of listed consumer goods firms is explained by the explanatory variables included in the model. The probability of the F-statistic is 0.0000, which is significant at the 5 percent level, showing that the model as a whole is valid and statistically reliable. The coefficient of research and development expenditure is 2.7859 with a probability value of 0.0060, indicating that R&D expenditure has a significant positive effect on the value added of listed consumer goods firms in Nigeria at the 5 percent level. The null hypothesis is therefore rejected.

5. Discussion

The result shows that R&D expenditure has a significant positive effect on the value added of listed consumer goods firms in Nigeria. This finding is consistent with the findings of Rahman and Howlader (2022); Amos et al. (2022); Uwah and Akinninyi (2020); Didia and Nadube (2016); and Khalifa (2023), which reported positive effects of R&D on firm performance, value, and innovation. However, the finding does not agree with the findings of Owota and Mansi (2025) and Anidebe et al. (2021), which found that R&D did not significantly impact firm value. These differences may be explained by sector-specific characteristics, capital intensity, and longer gestation periods for innovation returns in those industries.

The result is also in line with international evidence. Sulimany (2025) found that R&D expenditure supports the financial sustainability of S&P 500 firms, and Hutauruk (2024) reported a positive and significant effect of R&D on the value of Indonesian palm oil firms. Karna et al. (2022) show that, although higher R&D intensity lowers the profitability of U.S. firms in the short run, its effect on capital market performance is positive and persistent, which supports a long-term, value-oriented reading of the present result. In Europe, Doni and Fiameni (2024) indicated that R&D intensity is value-relevant and shapes the financial payoff of firms' wider strategies. By contrast, Khan et al. (2023) reported a negative association between R&D and the performance of Chinese listed firms, and Kim et al. (2018) found an inverted U-shaped relationship between R&D investment and firm value in China, suggesting that returns to R&D may diminish beyond a certain level of spending. Since the median R&D expenditure in the present sample is zero and the mean is small relative to value added (Table 4.1), the positive

linear effect observed here is plausibly the result of firms operating at the early, increasing-returns stage of the R&D–value relationship; future studies could test this with non-linear specifications.

The African evidence also helps to interpret the low level of R&D commitment among the Nigerian firms studied. Shibia (2023) shows that access to external finance, export participation and firm size raise the likelihood that Kenyan manufacturers undertake R&D, while Totowa and Godspower-Akpomiemie (2024) find that innovation acquired through patents and licences improves the performance of South African listed firms but that government innovation policies can hinder it. These findings suggest that financing constraints and the policy environment may be important in explaining why R&D spending remains limited in the Nigerian consumer goods sector.

6. Conclusions and Recommendation

6.1 Conclusion

The finding that research and development (R&D) expenditure has a significant positive effect on value added among listed consumer goods firms in Nigeria indicates that R&D spending plays a vital role in enhancing productive capacity, operational efficiency, product quality, innovation, and value creation. Based on the outcome of the study, it is, therefore, concluded that R&D is an essential driver of value creation and contributes to the competitiveness, sustainability, and economic development of consumer goods firms in Nigeria.

6.2 Recommendation

Listed consumer goods firms in Nigeria should allocate a dedicated portion of their annual budgets to research and development projects to increase value added, strengthen competitiveness, and sustain long-term growth.

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