

Effect of Capital Mix on The Financial Performance of Listed Industrial Goods Manufacturing Firms in Nigeria, 2012–2025

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Abstract

This study examined the effect of capital mix on the financial performance of listed industrial goods manufacturing firms in Nigeria from 2012 to 2025. Specifically, it assessed the effects of debt, equity and retained earnings on financial performance. An ex-post facto research design was adopted, using secondary panel data obtained from the audited annual reports of ten listed industrial goods manufacturing firms. Panel regression analysis involving pooled OLS, fixed-effects and random-effects models was employed. The Hausman specification test produced a chi-square value of 73.676 and p-value of 0.000, supporting the fixed-effects model. The results revealed that equity financing had a significant negative effect on financial performance ($\beta = -0.624$, $p = 0.000$), retained earnings had a significant positive effect ($\beta = 3.949$, $p = 0.000$), while debt had a positive but insignificant effect ($\beta = 0.441$, $p = 0.134$). The study recommends greater reliance on productive retained earnings and prudent financing decisions.

Keywords: Capital Mix; Debt Financing; Equity Financing; Retained Earnings; Financial Performance; Industrial Goods Manufacturing Firms.

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I. INTRODUCTION

The financing decision is one of the most important decisions confronting business organizations because it determines how firms obtain the resources required to finance operations, acquire assets, expand production capacity and pursue investment opportunities. The combination of financing sources employed by a firm is generally referred to as capital mix, comprising debt, equity and retained earnings. The choice of an appropriate capital mix has important implications for the cost of capital, financial risk, shareholders' returns, profitability and long-term survival of a firm. A well-structured capital mix enables an organization to balance the benefits and risks associated with alternative sources of finance and can enhance both performance and corporate sustainability. However, capital mix remains one of the complex issues in corporate finance because the appropriate financing combination may vary according to the characteristics of firms and prevailing economic conditions.

Financial performance represents the extent to which an organization effectively utilizes its resources to achieve desirable financial outcomes. It reflects the financial health and profitability of a firm and provides a basis for assessing managerial effectiveness, investment decisions and organizational sustainability. In this study, financial performance is measured using profit margin and return on assets, while capital mix is represented by debt, equity and retained earnings. Debt represents the firm's short- and long-term borrowing, equity represents the residual interest after deducting total liabilities from total assets, while retained earnings represent profits retained after meeting costs, taxes and dividends.

Debt is an important component of capital mix because it provides firms with funds for financing assets and operations without immediately diluting ownership. When borrowed funds are invested productively, debt can support expansion and potentially improve returns to shareholders. However, excessive reliance on debt increases interest costs, repayment obligations and financial risk. Manufacturing firms with high debt levels may consequently devote a substantial proportion of their income to servicing loans, leaving fewer resources for productive investment. The debt ratio therefore provides an indication of the extent to which a firm relies on borrowed funds to finance its assets and operations.

Equity is another major financing source and represents the owners' financial interest in the firm. Equity financing can strengthen the financial position of an organization because it does not create the fixed interest and principal repayment obligations associated with debt. Nevertheless, excessive reliance on equity may dilute existing ownership interests and affect returns attributable to shareholders. Retained earnings, in contrast,

constitute internally generated finance that can be reinvested in working capital, fixed assets, expansion and other productive activities. The preference for retained earnings is consistent with the Pecking Order Theory, which proposes that firms generally prefer internal financing before resorting to debt and, ultimately, new equity because internal funds involve lower financing costs and information asymmetry.

The issue is particularly important for industrial goods manufacturing firms because these businesses are highly capital-intensive and require substantial funds for machinery, equipment, production facilities, inventories and working capital. In Nigeria, industrial goods manufacturing firms operate in a dynamic environment characterized by changing economic policies, increasing prices and rising operational costs. To remain operational and meet market demand, firms may obtain short- or long-term loans, often under stringent repayment conditions. The resulting high cost of debt servicing can reduce funds available for productive investment and consequently affect financial performance. However, the extent to which the cost of debt has affected the financial performance of listed industrial goods manufacturing firms remains an empirical question.

The problem is further reflected in the low equity ratios associated with high debt levels. Evidence reported by Falami (2023) indicates that manufacturing firms have been grappling with low equity ratios arising from high debt, with substantial portions of income allocated to debt servicing. A high debt-to-equity ratio indicates greater reliance on borrowed funds, which can increase the cost of capital and expose firms to financial risk. Although debt can provide funds for expansion, excessive borrowing may adversely affect profitability and financial stability. The magnitude of the effect of low equity ratios on the financial performance of listed industrial goods manufacturing firms therefore requires empirical investigation.

Retained earnings present another important dimension of the problem. Increasing inflation and difficult operating conditions may force manufacturing firms to depend on internally generated funds to meet financial obligations. Where retained earnings are used to service debt rather than reinvested in productive activities, firms may have fewer resources for expansion, acquisition of equipment, technological improvement and working-capital requirements. This may also influence shareholders' perceptions and investment decisions. Evidence cited by Tesfa (2024) and Olaoye and Olaoye (2022) points to the increasing reliance of manufacturing firms on retained earnings in meeting debt costs. Consequently, there is a need to establish empirically how debt, equity and retained earnings affect financial performance.

Existing empirical literature also reveals important gaps. First, a conceptual gap exists because many Nigerian studies have concentrated mainly on external financing components, particularly debt and equity, while retained earnings have been largely ignored or inadequately incorporated. Since retained earnings represent a major source of internal financing, their exclusion limits a comprehensive understanding of capital mix. Second, a contextual gap exists because relatively few studies have focused specifically on listed industrial goods manufacturing firms despite their high capital intensity and exposure to macroeconomic instability. Third, many previous studies have relied on older datasets that may not adequately reflect recent economic conditions, including exchange-rate volatility and post-COVID-19 disruptions. Finally, empirical findings concerning leverage and financial performance remain inconsistent, indicating the need for further evidence within the Nigerian context.

The period 2012–2025 is particularly relevant to the present investigation. The study covers ten listed industrial goods manufacturing firms in Nigeria whose audited annual reports were accessible for the period. The period begins with Nigeria's adoption of International Financial Reporting Standards (IFRS) in 2012, which provided a more uniform financial reporting framework. The selected firms are Berger Paints Plc, Cutix Plc, Dangote Cement Plc, Frown Aluminum Nigeria Plc, Portland Paints and Products Nigeria Plc, Meyer Plc, Premier Paints Plc, Morison Industries Limited, Lafarge Africa Plc and Honeywell Flour Mill Plc.

The central problem addressed by the study is therefore the uncertainty surrounding the extent to which the three components of capital mix—debt, equity and retained earnings—affect the financial performance of listed industrial goods manufacturing firms in Nigeria. While debt may provide funds for expansion, excessive borrowing may increase financial costs and risk. Equity may strengthen financial stability but may also have implications for shareholders' returns. Retained earnings provide internal financing, but their availability and utilization may be constrained by profitability, dividend obligations and debt-servicing requirements. The inconsistent findings of previous studies and the limited integration of these three financing components provide justification for a comprehensive empirical investigation.

Accordingly, the study specifically seeks to ascertain the extent to which debt affects the financial performance of listed industrial goods manufacturing firms in Nigeria; to examine the extent to which equity affects the financial performance of listed industrial goods manufacturing firms in Nigeria; and to investigate the extent to which retained earnings affect the financial performance of listed industrial goods manufacturing firms in Nigeria.

II. REVIEW OF RELATED LITERATURE

Conceptual Review

Capital mix refers to the combination of financial sources used by a firm to finance its operations, assets and investment activities. It is an important financial management decision because the choice of financing sources affects the cost of capital, financial risk, shareholders' returns, profitability and the long-term sustainability of the firm. In this study, capital mix comprises debt, equity and retained earnings. The appropriate combination of these sources is expected to influence the ability of firms to finance productive activities and generate satisfactory financial returns.

Debt Financing

Debt financing represents the funds obtained by a firm through short-term and long-term borrowing. Debt enables firms to obtain resources for financing assets, production activities and expansion without immediately diluting ownership. Where borrowed funds are invested efficiently, debt can contribute to business growth and improve returns to shareholders. However, excessive dependence on debt increases interest expenses, repayment obligations and financial risk. Consequently, firms with high levels of debt may have fewer resources available for productive investment because a substantial proportion of their income may be committed to servicing financial obligations. Evidence from Tesfa (2024) supports this concern, as the study reported a negative and significant relationship between leverage and firm profitability.

Equity Financing

Equity financing represents the owners' financial interest in a firm and provides a source of capital that does not normally require compulsory interest or principal repayments. Equity can strengthen the financial position of a firm and reduce dependence on borrowed funds. Nevertheless, excessive reliance on equity financing may dilute existing shareholders' ownership interests and affect the returns attributable to shareholders. Evidence from Adeleke (2024) indicates that equity financing had a positive and significant effect on the financial performance of quoted manufacturing firms in Nigeria, although the direction of this relationship may vary according to the characteristics and financing requirements of individual firms.

Retained Earnings

Retained earnings represent accumulated profits that are retained within the business rather than distributed to shareholders as dividends. They constitute an important source of internal finance that can be used to finance working capital, acquire fixed assets, expand production capacity, improve technology and meet other corporate financing requirements. Because retained earnings are internally generated, their use can reduce dependence on external borrowing and the associated financing costs. Tesfa (2024) found a positive and significant effect of retained earnings on firm performance, suggesting that internally generated funds can provide an important basis for improving profitability.

Financial Performance

Financial performance refers to the financial achievements and overall financial condition of a firm over a specified period. It provides an indication of the firm's ability to utilize its available resources efficiently and generate financial returns. In this study, financial performance is measured using profit margin and return on assets (ROA). These measures provide an appropriate basis for assessing whether differences in debt, equity and retained earnings are associated with differences in the financial outcomes of listed industrial goods manufacturing firms.

Empirical Review

Tesfa (2024) examined the relationship between capital structure and firm performance among manufacturing firms, focusing particularly on leverage and retained earnings. The study employed an ex-post facto design and panel data, while the Generalized Method of Moments (GMM) was used to address endogeneity and unobserved heterogeneity. Financial performance was measured by ROA, while leverage and retained earnings represented the capital-structure variables. The findings showed that leverage had a negative and significant effect on profitability, indicating that excessive debt increases financial risk and interest obligations. In contrast, retained earnings had a positive and significant effect on performance. The study concluded that internally generated funds provide a stable and cost-effective source of finance. However, the study excluded equity financing, thereby leaving a gap that the present study addresses by examining debt, equity and retained earnings together.

Adeleke (2024) investigated the effect of capital structure on the financial performance of quoted manufacturing firms in Nigeria. The study used an ex-post facto research design and panel data obtained from audited financial statements of firms listed on the Nigerian Exchange Group. Financial performance was measured using ROA and ROE, while capital structure was disaggregated into short-term debt, long-term debt and equity. Panel regression techniques, including fixed- and random-effects models, were applied. The findings revealed that short-term debt had a positive and significant effect on performance, while equity financing also had a positive and significant effect. Conversely, long-term debt had a negative effect on performance, which was attributed to high interest costs and rigid repayment obligations. Although the study is closely related to the present research, it excluded retained earnings, creating a gap in the comprehensive assessment of capital mix.

Shrouder (2024) examined the effect of debt maturity structure on firm performance in Algeria, focusing on short-term and long-term debt. The study adopted an ex-post facto design and used panel data from published financial statements. Financial performance was assessed using profitability indicators, while panel regression was used to examine the relationships. The findings indicated that long-term debt had a negative and statistically significant effect on profitability because of financial rigidity, interest burden and repayment pressure. Conversely, short-term debt had a positive and significant effect on performance, suggesting greater operational flexibility and lower financing costs. The study concluded that debt maturity structure is important in determining firm performance and recommended limiting excessive long-term borrowing. However, its focus on Algeria limits direct generalization to Nigerian industrial goods manufacturing firms.

The three studies collectively demonstrate that the relationship between financing decisions and financial performance is not uniform. Tesfa (2024) emphasizes the positive contribution of retained earnings and the negative effect of excessive leverage; Adeleke (2024) finds different effects for short-term debt, long-term debt and equity; while Shrouder (2024) similarly demonstrates that the maturity of debt matters. Importantly, none of the three studies provides a complete examination of debt, equity and retained earnings simultaneously, which is the distinctive focus of the present study. The literature also identifies this as a conceptual gap because retained earnings have frequently been omitted from capital-mix models, despite being an important internal source of finance.

Theoretical Framework

Pecking Order Theory

The Pecking Order Theory (POT) provides the theoretical foundation for this study. The theory was developed from earlier work on corporate financing preferences and formally advanced by Myers and Majluf (1984) in their analysis of corporate financing and investment decisions under information asymmetry. The theory argues that firms generally follow a financing hierarchy when funding their activities. They first prefer internally generated funds, particularly retained earnings; when internal funds are insufficient, they resort to debt financing; and external equity financing is generally considered the least preferred alternative. This financing preference arises partly because managers possess more information about the firm's value and investment opportunities than outside investors, creating information asymmetry and making external financing comparatively costly. (SSRN) The theory is particularly relevant to this study because the three explanatory variables—retained earnings, debt and equity—represent the major financing alternatives available to firms. From the perspective of the theory, reliance on retained earnings should enable firms to finance investment without incurring additional borrowing costs or issuing new shares. Where internal funds are inadequate, debt is preferred to new equity because debt generally involves less information-related pricing difficulty and does not immediately dilute existing ownership. Myers (1984) similarly describes the pecking order as a preference for internal finance over external finance and debt over equity when external finance is required. (DOI)

The theory therefore provides a useful basis for explaining how the financing choices of listed industrial goods manufacturing firms may influence financial performance. Efficient utilization of retained earnings may enhance performance by reducing dependence on costly external financing, while excessive debt may increase financial obligations and financial risk. Similarly, heavy reliance on external equity may have implications for existing shareholders through ownership dilution. Thus, the Pecking Order Theory provides a logical framework for examining the effect of capital mix on the financial performance of listed industrial goods manufacturing firms in Nigeria, 2012–2025.

III. METHODOLOGY

The study adopted an ex-post facto research design because the variables had already occurred and could not be manipulated by the researcher. The study covered ten listed industrial goods manufacturing firms in Nigeria and used secondary panel data obtained from their audited annual reports and accounts for 2012–2025. Capital mix constituted the explanatory variable and was operationalized through debt, equity and retained earnings, while financial performance constituted the dependent variable and was measured using profit margin and return on assets (ROA). Debt was measured as total short- and long-term debt relative to total assets; equity was measured as total assets less total liabilities; and retained earnings represented accumulated profits retained after costs, taxes and dividends.

Panel regression analysis was employed because the dataset combines cross-sectional observations of firms with time-series observations over the study period. The analysis considered pooled ordinary least squares, fixed-effects and random-effects estimations to account for differences among firms and changes over time. The general panel model was specified as:

$$Y_{it} = \beta_0 + \beta_1 X_{1_it} + \beta_2 X_{2_it} + \beta_3 X_{3_it} + \mu_{it}$$

For the study, the functional model was specified as:

$$FP_{it} = \beta_0 + \beta_1 DC_{it} + \beta_2 EC_{it} + \beta_3 RE_{it} + \mu_{it}$$

Where

FP = represents financial performance of firm *i* in year *t*;

DC = represents the debt component;

EC = _{*i*} it represents the equity component;

RE = _{*i*} it represents retained earnings;

β_0 = is the constant term;

β_1 – β_3 = are the parameters to be estimated; and

μ = the error term.

Pooled OLS was first estimated as a preliminary model, while fixed-effects and random-effects models were subsequently estimated to account for firm-specific heterogeneity. The Hausman specification test was used to select between fixed and random effects. The study's Hausman result ($\chi^2 = 73.676$, $p = 0.000$) rejected the null hypothesis and supported the fixed-effects model as the appropriate final estimator. Statistical significance was assessed using probability values, while model explanatory power and overall significance were evaluated using R^2 /adjusted R^2 and the F-statistic, respectively.

IV. RESULTS

4.1 Panel Regression Model Selection

The study examined the effect of equity financing, retained earnings and debt financing on the financial performance of ten listed industrial goods manufacturing firms in Nigeria using panel data covering 2012–2025. Pooled ordinary least squares (OLS), fixed-effects and random-effects models were estimated. The Hausman specification test was then used to determine the appropriate estimator. The test produced a chi-square value of 73.676 with a probability value of 0.000. Since the probability value is less than the 5% significance level, the null hypothesis that the random-effects estimator is appropriate is rejected. Consequently, the fixed-effects model was selected as the preferred model for interpretation and hypothesis testing.

Table 4.1: Pooled Ordinary Least Squares Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Probability
Constant	8.178E+08	6.63E+09	0.12	0.902
Equity	–1.081	0.151	–7.14	0.000***
Retained Earnings	11.792	1.382	8.53	0.000***
Debt	–1.562	0.417	–3.75	0.000***

Model statistics: $R^2 = 0.519$; Adjusted $R^2 = 0.509$; F-statistic = 51.86; Prob(F-statistic) = 0.000; Observations = 148. *** Significant at 1%.

Table 4.2: Fixed-Effects Regression Results

Variable	Coefficient	Std. Error	t-value	p-value
Equity	–0.624	0.075	–8.36	0.000***
Retained Earnings	3.949	0.777	5.08	0.000***
Debt	0.441	0.292	1.51	0.134
Constant	1.462E+10	3.206E+09	4.56	0.000***

Model statistics: $R^2 = 0.594$; F-test = 61.980; Prob > F = 0.000; Observations = 140. *** Significant at 1%.

Table 4.3: Random-Effects Regression Results

Variable	Coefficient	Std. Error	z-value	p-value
Equity	–0.734	0.107	–6.88	0.000***
Retained Earnings	6.552	1.056	6.20	0.000***
Debt	–0.367	0.372	–0.99	0.323
Constant	1.13E+10	8.70E+09	1.29	0.196

Model statistics: Overall $R^2 = 0.496$; Wald $\chi^2(3) = 130.343$; Prob > $\chi^2 = 0.000$; Observations = 140; Number of groups = 10.

Table 4.4: Hausman Specification Test

Test Statistic	Chi-square	p-value	Decision
Hausman Test	73.676	0.000	Reject H_0 ; Fixed Effects

Null hypothesis (H_0): The difference in coefficients is not systematic and the random-effects model is appropriate. Since $p = 0.000 < 0.05$, H_0 is rejected and the fixed-effects model is preferred.

4.2 Interpretation of the Preferred Fixed-Effects Results

The fixed-effects model explains 59.4% of the variation in financial performance, while the remaining 40.6% is attributable to factors not included in the model. The F-statistic of 61.980 with $p = 0.000$ confirms that equity, retained earnings and debt jointly have a statistically significant effect on financial performance.

Equity financing has a coefficient of -0.624 and a p-value of 0.000 . The negative and statistically significant coefficient indicates that increased equity financing is associated with lower financial performance, holding other variables constant. The first null hypothesis is therefore rejected.

Retained earnings have a coefficient of 3.949 and a p-value of 0.000 . This positive and statistically significant coefficient indicates that greater retained earnings are associated with improved financial performance. The second null hypothesis is rejected.

Debt financing has a positive coefficient of 0.441 but a p-value of 0.134 . Because the probability value exceeds 0.05 , the effect is statistically insignificant. The third null hypothesis is therefore not rejected. Thus, within the study period, debt does not have a statistically significant effect on financial performance.

4.3 Summary of Hypothesis Testing

Hypothesis	Coefficient	p-value	Decision	Conclusion
H ₀₁ : Equity has no significant effect	-0.624	0.000	Reject H ₀₁	Significant negative effect
H ₀₂ : Retained earnings have no significant effect	3.949	0.000	Reject H ₀₂	Significant positive effect
H ₀₃ : Debt has no significant effect	0.441	0.134	Fail to reject H ₀₃	Insignificant effect

Source: Researcher's computation as reported in the supplied study document. The tables reproduce the reported regression and Hausman statistics without introducing new estimates.

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary of Findings

The study examined the effect of capital mix on the financial performance of listed industrial goods manufacturing firms in Nigeria for the period 2012–2025. Capital mix was represented by equity financing, retained earnings and debt financing, while financial performance was assessed using the study's financial performance measure. Panel regression analysis was conducted using pooled OLS, fixed-effects and random-effects models. The Hausman test produced a chi-square value of 73.676 ($p = 0.000$), indicating that the fixed-effects model was the appropriate estimator. The fixed-effects model produced an R^2 of 0.594 , showing that equity, retained earnings and debt jointly explained 59.4% of the variation in financial performance. The model was statistically significant with an F-statistic of 61.980 ($p = 0.000$).

The findings showed that equity financing had a negative and statistically significant effect on financial performance, with a coefficient of -0.624 and $p = 0.000$. Retained earnings had a positive and statistically significant effect, with a coefficient of 3.949 and $p = 0.000$, while debt financing had a positive but statistically insignificant effect, with a coefficient of 0.441 and $p = 0.134$.

Conclusion

The study concludes that capital mix is an important determinant of the financial performance of listed industrial goods manufacturing firms in Nigeria, although its individual components have different effects. Retained earnings emerged as the strongest positive contributor to financial performance, indicating the importance of internally generated funds in supporting productive investment and reducing dependence on external financing. Equity financing, however, exhibited a significant negative relationship with performance, suggesting that excessive reliance on equity may be associated with inefficient capital utilization or dilution effects. Debt financing did not have a statistically significant effect on performance during the study period. Overall, the findings demonstrate that the composition of capital, rather than simply the availability of finance, is important to firm performance.

Recommendations

Based on the findings, the study recommends that:

1. Management should strengthen retained-earnings financing. Firms should adopt appropriate profit-retention policies and reinvest retained earnings in productive assets, technological improvement and business expansion because retained earnings demonstrated a significant positive effect on financial performance.
2. Firms should exercise caution in expanding equity financing. Management should carefully evaluate additional equity issues and ensure that shareholders' funds are allocated efficiently to productive investments to minimize dilution and inefficient capital utilization.
3. Debt financing should be strategically managed. Although debt had no significant effect on financial performance, firms should avoid unnecessary borrowing and carefully evaluate the cost, maturity and expected returns of debt-financed investments before assuming additional financial obligations.

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