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FREE CASH FLOW EFFICIENCY, INVENTORY TURNOVER, AND FINANCIAL LEVERAGE AS PREDICTORS OF MARKET VALUATION AMONG NIGERIAN CONSUMER GOODS FIRMS

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ABSTRACT
This study examined the effects of free cash flow efficiency, inventory turnover, and financial leverage on the market valuation of Nigerian manufacturing firms, with market capitalisation serving as the valuation proxy. Using panel data from the 2012 to 2023 audited annual reports of sampled firms listed in the consumer goods sector of the Nigerian Exchange Group, the research employed fixed effects, random effects, and robust regression models, supported by diagnostic and robustness checks to ensure the reliability of results. The specific objectives were to determine the individual and combined effects of the three explanatory variables on market value, assess their statistical significance, and provide practical recommendations for managers and policymakers. The findings reveal that firm size consistently and positively influences market valuation, while firm age exerts a negative effect across all model specifications. Free cash flow efficiency and inventory turnover show positive but generally insignificant effects, except for inventory turnover in the robust regression, while financial leverage has a negative and significant association in some models. Based on these results, the study recommends that Manager's focus on expanding firm size and exercising caution with debt financing, policymakers enhance governance and market transparency, and investors prioritise firm size and age in valuation assessments.

Key words: *Financial Leverage, Free Cash Flow Efficiency, Inventory Turnover, Market Valuation.*

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INTRODUCTION
Market valuation is the extent to which a firm's equity reflects its fundamental performance. It is a key indicator of investor confidence and capital market efficiency in emerging economies. Common proxies such as Tobin's Q, market capitalization, and price-to-book ratio are widely used to capture how internal management practices translate into perceived value by the market. Rahat & Nguyen (2024) study on ESG effects uses market capitalisation and value-to-sales proxies). In emerging markets, investors are increasingly attentive to internal performance metrics, moving beyond traditional accounting measures. Free cash flow efficiency, inventory turnover, and financial leverage are internal indicators critical to how manufacturing firms operationalize strategy to drive value. Free cash flow efficiency reflects

operational liquidity and reinvestment capability; inventory turnover indicates working capital management effectiveness; and financial leverage captures the balance between debt and equity in financing operations. Their interplay can significantly influence market perceptions, especially in operationally intensive sectors like manufacturing, (Olufemi, 2025).

In Nigeria, manufacturing firms face structural inefficiencies, high working capital requirements, and volatility in macroeconomic conditions. Despite the sector's importance to economic development, empirical evidence linking internal finance efficiency metrics and market valuation in this context remains limited. Although several studies have evaluated inventory management and performance (Akinleye & Adesina, 2024; Jonah, et al., 2023)), few have explored the direct connection to market valuation measures like market capitalisation in listed manufacturing firms in Nigeria Most prior research on Nigerian manufacturing firms has focused on profitability outcomes like return on assets or net profit margin, rather than market valuation outcomes. Jonah, et al. (2023) found that inventory turnover positively predicts net profit margin and Return on assets (ROA) in listed industrial goods firms, but they did not extend this to market valuation measures. Moreover, the combined effect of internal efficiency metrics (specifically free cash flow efficiency, inventory turnover) and financial leverage on market valuation remains uncharted. Studies often isolate one factor at a time, lacking a holistic empirical framework examining how operational efficiency and capital structure jointly influence firm value. This gap signals the need for research tying these dimensions together in the Nigerian manufacturing context.

This research fills a critical gap by linking operational efficiency and capital structure with investor-driven firm valuation in Nigeria's manufacturing sector. The integrated framework proposed will expand theoretical understanding of how internal metrics drive market value. Practically, findings will inform corporate managers on optimizing cash flow, inventory, and capital structure to enhance market valuation. Policymakers and regulators may use insights to encourage disclosure practices that improve market assessment of firm value.

Objectives

The main objective of this research is to empirically assess the predictive roles of internal financial efficiency metrics on market valuation among listed manufacturing firms in Nigeria. Specifically, the study intends to:

1. ascertain if free cash flow efficiency has a positive and significant effect on the market valuation of Nigerian manufacturing firms.
2. determine if inventory turnover has a positive and significant effect on the market valuation of Nigerian manufacturing firms.
3. ascertain if financial leverage has a positive and significant effect on the market valuation of Nigerian manufacturing firms.

LITERATURE REVIEW

Empirical Review

Free Cash Flow Efficiency and Firm Valuation

Free cash flow efficiency reflects how well a firm converts operating cash flow into value-generating free cash flows—often measured as free cash flow relative to sales or total assets. Firm valuation is commonly represented by Market capitalization, defined as the total market value of a company's outstanding shares of common stock. It is calculated by multiplying the current share price by the total number of outstanding shares. Market capitalisation serves as a measure of a firm's size and reflects how the stock market values the company, incorporating investors' expectations of its future earnings, growth potential, and risk profile. In research contexts, such as this study, it is often used as a proxy for market valuation (Chancharat & Kumpamool, 2022). Efficient cash flow usage reduces reliance on external finance and mitigates agency costs, thus enhancing market valuation signals.

Salehi, (2022) studied 177 listed firms on the Tehran Stock Exchange (2014–2021) and find that investment efficiency, a proxy closely related to free cash flow efficiency, significantly boosts market capitalisation. Moreover, stronger board independence and institutional ownership amplify this effect, underscoring how governance moderates internal financial efficiency's impact on firm value. Similarly, Figlioli et al. (2020) investigate Brazilian firms and demonstrate that cash flow generation significantly influences firm valuation when accounting for internal finance dynamics and investment constraints. These studies confirm that firms with strong internal cash flow performance are rewarded by market valuation, especially in emerging economies with limited external capital access. However, Aigienohuwa and Erah (2025) studied listed manufacturing firms in Nigeria, using market

capitalisation as the measure of market value. They found a positive but non statistically significant relationship between Free Cash Flow Efficiency and Firm Valuation. This aligns with Olufemi (2025) who also found a positive but non statistically significant relationship. Based on the foregoing empirical evidence, the relationships between the study variables are therefore hypothesised as follows:

H_1: *Free cash flow efficiency has a positive and significant effect on the market valuation of Nigerian manufacturing firms.*

Inventory Turnover and Firm Value

Inventory turnover is calculated as cost of goods sold divided by average inventory—measures how quickly firms optimize working capital and respond to demand fluctuations. High turnover reduces holding costs and capital tied in stocks, thereby improving operational efficiency and potentially influencing how markets perceive firm value.

In Thailand, Chancharat and Kumpamool (2022) conducted a study in Thailand on working capital management using panel data finds that higher inventory turnover is significantly associated with improved market capitalisation and return on invested capital, demonstrating that more efficient inventory management is valued by capital markets. However, research from Pakistan in the service sector shows mixed results: while asset turnover positively affects firm performance, inventory turnover does not consistently predict market capitalisation, hinting at industry-specific dynamics, (Ahmad, et al., 2023). These findings suggest a link between working capital efficiency and valuation in manufacturing-heavy sectors, but less clear trends in services or firms with different operating models. On the contrary, Aigienohuwa and Erah (2025) found positive but non statistically significant relationship between Inventory Turnover and Firm Value. This is in tandem with Olufemi (2025) who also found a positive but non statistically significant relationship.

Drawing from the foregoing empirical evidence, the expected relationships among the study variables are hypothesised as follows:

H_2: *Inventory turnover has a positive and significant effect on the market valuation of Nigerian manufacturing firms.*

Financial Leverage and Market Performance

Financial leverage, typically measured by debt-to-assets or debt-to-equity ratio, reflects how firms balance debt financing and equity. It can increase firm value through tax benefits and investment ability, but excessive debt elevates risk and may dampen valuation.

Bui (2023) conducted a comprehensive analysis of Vietnamese listed firms (2012–2022) finds a non-linear relationship between debt and firm valuation: moderate leverage improves firm value up to an optimal point, beyond which the cost of debt and risk offset benefits. Similarly, Aigienohuwa and Erah (2025) and Olufemi (2025) in separate studies found positive but statistically significant relationship between Financial Leverage and Market Performance. Meanwhile, Ibrahim and Isiaka (2020) studied of Nigerian firms listed on the Nigerian Stock Exchange finds that the debt-to-equity ratio interacts with firm valuation (market capitalisation), though results vary by firm size and sector, with moderate leverage positively impacting market valuation up to a threshold. These findings uphold the trade-off theory: leverage enhances firm value but only when carefully managed. In line with the empirical evidence reviewed, the study proposes the following hypotheses regarding the relationships among the variables:

H_3: *Financial leverage has a positive and significant effect on the market valuation of Nigerian manufacturing firms.*

Emerging Markets and Nigeria-Relevant Context

While direct evidence in Nigeria linking free cash flow efficiency and inventory turnover to market capitalisation is limited, several studies in emerging markets provide a basis for inference. Amoah (2022) studied Ghanaian manufacturing firms and the results show that technically efficient operations lead to better investment decisions, and free cash flow positively influences firm investment, though not always significantly to valuation measures. Similarly, the Thai study above indicates that working capital variables including inventory turnover significantly affect market capitalisation, (Chancharat & Kumpamool, 2022).

Given the structural similarities (capital constraints, developing stock markets, governance variations) between Nigeria and these contexts, it is reasonable to hypothesize that free cash flow efficiency, inventory turnover, and moderate leverage would exert comparable influence on market valuation in Nigerian manufacturing firms. This provides strong empirical justification for investigating these relationships in your study using market capitalisation as the valuation proxy.

MATERIALS AND METHOD

This study employed ex-post facto and correlational research designs using panel data to assess the effect of free cash flow efficiency, inventory turnover, and financial leverage on market valuation among listed services firms in Nigeria. The ex-post facto design is suitable as it relies on existing financial data over which the researcher has no control, while the correlational design enables the examination of statistical relationships between variables. The population of the study comprised all 26 listed services sector firms on the Nigerian Exchange Group (NGX) as of 2023. Due to data availability and completeness over the study window period, a purposive sampling technique was applied, ensuring that only firms with consistent annual reports between 2012 and 2023 were included in the final balanced panel. The study utilized secondary data obtained from the 25 firms' audited financial statements and the NGX Factbook, which are credible and widely accepted sources for empirical corporate financial research in Nigeria.

The dependent variable is firm market valuation and this was measured using market capitalisation, which captures how the market perceives a firm's value relative to its assets (Bui et al., 2023). The independent variables are free cash flow efficiency, inventory turnover, and financial leverage, all of which represent internal financial and operational characteristics that may influence valuation. Two control variables—firm size and firm age—are included to adjust for the effects of firm scale and maturity. The panel regression model is specified as:

$MV_{it} = \beta_0 + \beta_1 FCFE_{it} + \beta_2 INT_{it} + \beta_3 LEV_{it} + \beta_4 FS_{it} + \beta_5 AGE_{it} + \epsilon_{it}$……. Eqn 1.

Descriptive statistics and correlation matrices are computed to summarize the data and assess potential multicollinearity. The main regression analysis is conducted using panel data techniques, including Pooled OLS, Fixed Effects (FE), and Random Effects (RE) models. The Hausman test is used to determine the more consistent model between FE and RE. Robustness checks such as heteroskedasticity testing, serial correlation diagnostics, and variance inflation factors (VIFs) are applied to validate the integrity of the estimates.

Table 1: Variable Description and Measurement

Variable	Type	Measurement	Source
Market Valuation	Dependent Variable	Market Capitalisation = Share Price*No of Shares	Aigienohuwa & Iyamu (2025)
Free Cash Flow Efficiency	Independent Variable	(Net CFO – Net CFI) / Revenue	Olufemi (2025)
Inventory Turnover	Independent Variable	Cost of Sales / Average Inventory	Chancharat & Kumpamool (2022)
Financial Leverage	Independent Variable	(Total Liabilities / Total Assets) × 100	Aigienohuwa & Irowa-Omeregie (2025)
Firm Size	Control Variable	Natural Log of Total Assets	Aigienohuwa & Erah (2025)
Firm Age	Control Variable	Number of Years Since Incorporation	Researcher's Computation from Annual Reports

Source: Researchers' Computation (2025)

ANALYSES AND RESULTS DISCUSSION

Descriptive Statistics

Table 2: Descriptive Statistics of Study Variables (2012–2023)

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
MCAP	12.00	12.00	16.00	6.00	2.30	192
FCFE	0.11	0.13	1.60	-7.20	0.58	196
INV	1.30	1.20	4.40	0.22	0.65	180
LEV	12.2	6.3	18.4	12	27.8	208
FSA	17.00	18.00	21.00	11.00	2.30	208
AGE	19	19	21	17	1.17	188

Keys: FCFE = Free Cash Flow Efficiency; INV = Inventory Turnover; LEV = Financial Leverage; FSA = Firm Size; AGE = Firm Age; MCAP = Market Capitalisation.
Source: Researchers' Computation (2025)

Table 2 presents the descriptive statistics for the variables used in the study over the period 2012–2023. The mean market capitalization (MCAP) is 12.00, with a median equal to the mean, indicating a fairly symmetrical distribution around the central value, and ranging from 6.00 to 16.00. Free cash flow efficiency (FCFE) has an average of 0.11, slightly lower than its median of 0.13, with values spanning from –7.20 to 1.60, suggesting the presence of firms with substantial negative cash flow efficiency during certain years. Inventory turnover (INV) averages 1.30, with a close median value of 1.20, and ranges from 0.22 to 4.40, reflecting differences in working capital management practices across firms. Financial leverage (LEV) shows a mean of 12.2 and a median of 6.3, with a minimum of 12 and maximum of 18.4, indicating relatively modest variation compared to other variables. Firm size (FSA), measured

as the natural logarithm of total assets, averages 17.00 with a median of 18.00, and ranges from 11.00 to 21.00, showing the inclusion of both small and large firms in the sample. Firm age (AGE) has a mean of 19 years, with values ranging between 17 and 21 years, indicating that the sample consists largely of mature firms. The standard deviations show that FCFE exhibits higher volatility relative to its mean, while AGE is the most stable variable, underscoring the consistency in firm maturity over the study period.

Correlation Matrix

Table 3: Pearson Correlation Matrix of Study Variables (2012–2023)

Variable	MCAP	FCFE	INV	LEV	FSA	AGE
MCAP	1.0000					
FCFE	0.0022	1.0000				
INV	-0.0221	-0.0103	1.0000			
LEV	0.0826	0.1165	-0.1773	1.0000		
FSA	0.8281	0.0056	-0.2241	0.1890	1.0000	
AGE	-0.1570	0.1350	-0.1731	0.0250	0.1922	1.0000

Keys: FCFE = Free Cash Flow Efficiency; INV = Inventory Turnover; LEV = Financial Leverage; FSA = Firm Size; AGE = Firm Age; MCAP = Market Capitalisation.
Source: Researchers' Computation (2025)

Table 3 shows the Pearson correlation coefficients among the study variables for the period 2012–2023. Market capitalization (MCAP) has a strong positive correlation with firm size (FSA) (r = 0.8281), indicating that larger firms tend to have higher market values. The relationship between MCAP and financial leverage (LEV) is weakly positive (r = 0.0826), while correlations with free cash flow efficiency (FCFE) (r = 0.0022) and inventory turnover (INV) (r = –0.0221) are negligible, suggesting minimal direct linear association. Firm age (AGE) is weakly and negatively correlated with MCAP (r = –0.1570), implying that older firms may have lower market valuations. Notably, FSA has weak negative correlations with both INV (r = –0.2241) and AGE (r = 0.1922), suggesting some trade-offs between firm size, operational efficiency, and age. Overall, the absence of high intercorrelations among independent variables indicates a low risk of multicollinearity in the regression analysis.

Diagnostic Tests

Table 4: Summary of Diagnostic Tests

Test	Purpose	Test Statistic	p-value	Decision (5% level)
Skewness/Kurtosis Test (joint)	Tests normality of variables	—	$p < 0.05$ for most variables	Reject normality assumption for all except MCAP (marginal)
Shapiro–Wilk Test	Tests normality of variables	W ranges: 0.259–0.980	$p < 0.05$ for all variables	Reject normality for all variables
Breusch–Pagan/Cook–Weisberg Test	Tests for heteroskedasticity in pooled OLS	$\chi^2(1) = 9.65$	0.0019	Heteroskedasticity present
Variance Inflation Factor (VIF)	Tests multicollinearity	Mean VIF = 1.08	—	No multicollinearity (VIF < 10)
Ramsey RESET Test	Tests model specification errors	$F(3,151) = 3.91$	0.0101	Possible omitted variables
Breusch–Pagan LM Test for RE	Tests random effects vs pooled OLS	$\chi^2 = 338.97$	0.0000	Random effects preferred over pooled OLS
Portmanteau Test (RE)	Tests serial correlation	$\chi^2(16) = 16.00$	0.4530	No serial correlation
Modified Wald Test (FE)	Tests groupwise heteroskedasticity	$\chi^2(17) = 106.29$	0.0000	Groupwise heteroskedasticity present
Hausman Test	Compares FE vs RE estimators	$\chi^2(5) = 22.26$	0.0005	Fixed effects preferred over random effects

Source: Researchers' Computation (2025)

The results of the diagnostic tests presented in Table 4 confirm several important considerations for the subsequent regression analysis. Normality assessment using both the Skewness/Kurtosis and Shapiro–Wilk tests indicates that all variables, except market capitalization (MCAP) in the Skewness/Kurtosis test, significantly deviate from normality at the 5% level, suggesting the presence of non-normal distributions and the need for robust estimation techniques. The Breusch–Pagan/Cook–Weisberg test for heteroskedasticity reveals a statistically significant result ($p = 0.0019$), indicating the presence of heteroskedasticity in the pooled OLS model. However, the Variance Inflation Factor (VIF) values are all well below the critical threshold of 10, with a mean VIF of 1.08, suggesting no multicollinearity concerns among the explanatory variables. The Ramsey RESET test yields

a p-value of 0.0101, pointing to possible model specification errors or omitted variables, which reinforces the need for careful model selection. For model type decisions, the Breusch–Pagan Lagrangian Multiplier test strongly supports the use of panel estimators over pooled OLS, while the Hausman specification test (p = 0.0005) favours the fixed effects model over random effects. Additionally, the Modified Wald test indicates groupwise heteroskedasticity in the fixed effects specification, while the Portmanteau test confirms the absence of serial correlation in the random effects model. Collectively, these results justify the adoption of the fixed effects model with robust standard errors to address heteroskedasticity and non-normality in the panel dataset.

Regression Results

Table 5a: Regression Results for the Effect of FCFE, INV, and LEV on MCAP (2012–2023)

Variable	Fixed Effects (Robust SE)	Random Effects (Robust SE)	Robust Regression
	Coef. (Std. Err.)	Coef. (Std. Err.)	Coef. (Std. Err.)
FCFE	0.0992 (0.0666)	0.1061 (0.0616)*	0.4674 (0.2956)
	t = 1.49, p = 0.156	*z* = 1.72, p = 0.085	*t* = 1.58, p = 0.116
INV	0.0878 (0.1672)	0.0749 (0.1745)	0.4574 (0.1228)***
	t = 0.52, p = 0.607	*z* = 0.43, p = 0.668	*t* = 3.73, p = 0.000
LEV	-0.0056 (0.0033)	-0.0068 (0.0035)**	-0.0116 (0.0046)**
	t = -1.68, p = 0.112	*z* = -1.96, p = 0.049	*t* = -2.51, p = 0.013
FSA	0.6235 (0.1941)***	0.8917 (0.1612)***	1.1734 (0.0447)***
AGE	-0.00063 (0.000096)***	-0.00071 (0.000085)***	-0.00072 (0.000077)***
Constant	13.0268 (2.6384)***	10.0349 (2.6404)***	4.9335 (1.6130)***

Table 5b: Model Statistics

Statistic	Fixed Effects	Random Effects	Robust Regression
Within R^2	0.5566	0.5446	—
Between R^2	0.8100	0.8232	—
Overall R^2	0.7690	0.7948	—
F-stat/Wald χ^2	F(5,16) = 18.30, p < 0.0000	$\chi^2(5)$ = 122.94, p < 0.0000	F(5,154) = 143.55, p < 0.0000
No. of Obs	160	160	160
No. of Groups	17	17	—
Min–Max Obs per Group	1 – 10	1 – 10	—
σ_u (Between-entity SD)	1.3938	0.8913	—
σ_e (Within-entity SD)	0.4955	0.4955	—
ρ (Intra-class correlation)	0.8878	0.7639	—

Keys: FCFE = Free Cash Flow Efficiency; INV = Inventory Turnover; LEV = Financial Leverage; FSA = Firm Size; AGE = Firm Age; MCAP = Market Capitalisation; *** p < 0.01, ** p < 0.05, * p < 0.1; and Robust standard errors in parentheses
Source: Researchers' Computation (2025)

The regression estimates in Table 5a compared the fixed effects (FE), random effects (RE), and robust regression models to examine the impact of free cash flow efficiency (FCFE), inventory turnover (INV), financial leverage (LEV), firm size (FSA), and firm age (AGE) on market capitalization (MCAP) for Nigerian consumer goods manufacturing firms from 2012 to 2023. The Hausman test results, reported earlier, favour the FE model over the RE specification, indicating that unobserved firm-specific effects are correlated with the regressors.

Under the FE model in Table 5b, FSA ($\beta = 0.6235$, $p < 0.01$) and AGE ($\beta = –0.00063$, $p < 0.01$) are statistically significant, suggesting that larger firms enjoy higher market capitalization, while older firms are associated with lower valuations. FCFE, INV, and LEV are not significant at conventional levels in the FE framework. The model exhibits strong explanatory power with a within R^2 of 0.5566, between R^2 of 0.8100, and overall R^2 of 0.7690. The RE results, while similar in sign, show that LEV becomes marginally significant ($\beta = –0.0068$, $p < 0.05$), indicating a negative relationship between leverage and market capitalization when random effects are assumed. RE also produces a higher overall R^2 (0.7948) and a between R^2 of 0.8232. However, due to the Hausman test outcome, the RE estimates may be biased and inconsistent.

Robust regression results, which address outlier influence and heteroskedasticity, reveal stronger effects for INV ($\beta = 0.4574$, $p < 0.01$), LEV ($\beta = –0.0116$, $p < 0.05$), and FSA ($\beta = 1.1734$, $p < 0.01$), with AGE remaining negatively significant. The larger coefficient magnitudes in the robust model suggest that extreme observations may have dampened the estimated effects in the FE and RE models.

Overall, the FE specification with robust standard errors is preferred for inference, as it accounts for unobserved firm heterogeneity and corrects for heteroskedasticity, while the robust regression provides complementary evidence on the stability and direction of relationships. The results collectively underscore the importance of firm size and age in shaping market valuation, with some evidence that high inventory turnover and lower leverage may also be beneficial when outlier effects are considered

Robustness Checks

Given the presence of heteroskedasticity, fixed effects estimates were re-estimated with Huber–White robust standard errors clustered by firm. This adjustment preserved the significance of firm size (positive) and firm age (negative), confirming their strong link to market capitalization. To limit the influence of outliers, a robust regression using Huber and biweight iterations was applied. Results showed inventory turnover became strongly positive and significant, leverage remained negative and significant, and the firm size effect increased in magnitude.

Key variables retained their signs across all models: firm size positive, firm age negative. Robust regression additionally emphasized the benefits of higher inventory turnover and lower leverage, suggesting that outliers may have muted these effects in standard models. Findings remain consistent and reliable.

Test of Hypotheses

Hypothesis One

H_o: Free cash flow efficiency has no positive and significant effect on the market valuation of Nigerian manufacturing firms.

H_i: Free cash flow efficiency has a positive and significant effect on the market valuation of Nigerian manufacturing firms.

The alternate hypothesis was only partially supported. Although FCFE showed a positive coefficient across models, the relationship was statistically insignificant in both the fixed and random effects specifications. This aligns with Nigerian evidence from Aigienohuwa and Erah (2025) and Olufemi (2025) but contrasts with findings from Salehi (2022) in Iran and Figlioli et al. (2020) in Brazil, where FCFE significantly improved market capitalisation. Differences in governance structures, market depth, and macroeconomic stability could explain why efficient cash flow management does not consistently translate into higher market value in Nigeria.

Hypothesis Two

H_o: Inventory turnover has no positive and significant effect on the market valuation of Nigerian manufacturing firms.

H_i: Inventory turnover has a positive and significant effect on the market valuation of Nigerian manufacturing firms.

The alternate hypothesis was likewise only partially supported. INV had a positive but statistically insignificant effect in the fixed and random effects models, consistent with Aigienohuwa and Erah (2025) and Olufemi (2025). However, the robust regression model revealed a significant positive association, suggesting that when outlier effects are controlled, efficient inventory management does improve market value. This discrepancy with Chancharat and Kumpamool's (2022) Thai evidence, where inventory turnover significantly boosted market capitalisation, could reflect Nigeria-specific supply chain volatility, inflationary pressures, and demand fluctuations that mask efficiency gains in standard estimations.

Hypothesis Three

H_o: Financial leverage has no positive and significant effect on the market valuation of Nigerian manufacturing firms.

H_i: Financial leverage has a positive and significant effect on the market valuation of Nigerian manufacturing firms.

The alternate hypothesis was not supported in its positive direction. LEV showed a negative relationship with market capitalization, significant in the robust regression and marginally significant in the random effects model. This finding diverges from the positive Nigerian results of Aigienohuwa and Erah (2025) and Olufemi (2025) and from the optimal leverage threshold identified by Bui (2023) in Vietnam. The negative relationship observed here is consistent with the trade-off theory's warning that excessive leverage increases risk and erodes value once optimal levels are exceeded.

From a practical standpoint, firm size (FSA) emerged as a robust and consistently positive determinant of market value, while firm age (AGE) was consistently negative. These results suggest that managers seeking to enhance valuation should focus on growth strategies, capacity expansion, and maintaining a youthful operational profile while exercising caution in debt financing. Regulators can support this by fostering governance frameworks and market

transparency that enable efficiency metrics like FCFE and INV to be more effectively priced into market valuations.

CONCLUSION AND RECOMMENDATIONS

This study examined the effects of free cash flow efficiency, inventory turnover, and financial leverage on the market valuation of Nigerian manufacturing firms using panel data from 2012 to 2023, with market capitalisation as the valuation proxy. The findings indicate that firm size positively and significantly influences market value, while firm age has a negative and significant effect. FCFE and INV generally exhibited positive but insignificant effects, except for INV in the robust regression, while LEV showed a negative and significant association in certain model specifications. These outcomes suggest that, within the Nigerian manufacturing context, market valuation is driven more by firm size and structural attributes than by operational efficiency measures or leverage levels.

In view of these, the study recommended that Managers of Nigerian manufacturing firms should prioritise strategies that expand firm size—such as mergers, acquisitions, and capacity building—given its consistent and positive impact on market valuation. At the same time, caution is advised in the use of debt financing, as higher leverage levels were found to negatively affect valuation in this study. Policymakers can play a key role by strengthening corporate governance frameworks and enhancing market transparency, enabling efficiency measures like free cash flow efficiency and inventory turnover to be more accurately reflected in market prices. For investors, firm size and age should be treated as critical valuation signals, while excessive leverage should be approached with caution, particularly in Nigeria's volatile economic environment. Finally, future research should explore how sector-specific characteristics, macroeconomic conditions, and governance quality may moderate the relationship between efficiency indicators and market valuation in emerging markets.

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