

## OPERATING LEVERAGE AND FIRM VALUE OF MANUFACTURING FIRMS IN NIGERIA

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### Abstract

*The study examined the impact of Operating leverage on firm value of quoted manufacturing firms in Nigeria. The study selected twenty-two (22) listed (Consumer goods sector) manufacturing firms listed on Nigeria Stock Exchange from 2013-2019. The data used for this study are panel data. The result of this study revealed that DVAS (Variability in sales) has negative insignificant effect on firm value at ( $\beta=-1.04$ ,  $P>0.05$ ). DVPBIT (Variability in profit before interest and tax) has positive insignificant effect on firm value at ( $\beta=12.6$ ,  $P>0.05$ ). OPLE (Operating leverage in asset) has negative significant effect on firm value at ( $\beta=-18.95$ ,  $P<0.05$ ). Based on the findings of the study, it were therefore recommended that; firms would benefit from the quick variability in fixed asset to current asset. (Changes in fixed cost into variable cost influences sales and long-run profit).*

**Keywords:** *Leverage; operating leverage; firm value; firm; Nigeria*

**JEL Classification:** *G31, G32, C5*

### 1. Introduction

A firm is an organic structure working in a systematic flow towards actualizing shareholder's fund. But in actualizing this time-bound goal the financial manager who is in the tactical level of the organization is saddled with financing and investment decision which are the two germane finance decision. These decisions adjusts in respects to firm intrinsic attributes; such as firm location, corporate structure and type of industry.

However, the financial decision details about the capital structure (debt-to-equity mix) that firm will combine in investing on project with positive Net present value. The capital structure variability (Financial leverage) and variability in its operation (operating leverage) have to be put into consideration in terms of mitigating against risk (Financial and business risk) and increase the returns on firm (Pandey, 2005). In terms of operating leverage, it is variability in operation that gives a picture on how a firm will employ its fixed cost among all the various type of cost in increasing its operating profit.

This study examined the impact of operating leverage on firm value based on the implication of traditional measurement of operating leverage in studies like Pradeep, Shailendra & Pijush (2016), John, Samuel & Richard (2013), Soin & Sang- Bum (2014) and Dagogo (2014) which do not capture the cost and risk exposure. The degree of operating leverage measurement assumes a percentage change in output of firms and also does not take a direct cognizance of firms that have incurred losses in past years subject to calculations. But Penman (2012) indicated the relevance of direct measures and Akingunola (2016) indicated the measures which will aid to show the firms cost and

risk exposure in terms of operating leverage. This measure will allow the operating leverage be deduced from various sections of the firm final account. This measurement will aid the firm to understand its risk complexion (Bierman & Hass, 1975). Depicting that operating leverage will be measured in terms of operating leverage in asset, variability of sales and variability of profit before interest and tax, this measurement will aid to validate the ideology of Beirman and Hass (1975) that relevance of operating leverage is to indicate the risk exposure and cost implication in the operating activities of a firm.

An implication of using operating leverage when studying this phenomenon is that fixed and variable cost are not easily obtained from the financial statement. Companies tend to report them as operating costs or sometimes more specific, but not labeled as either fixed or variable cost. When costs are separated into categories in the financial statement, it opens up for the possibility of estimating fixed and variable cost which aid to deduce direct costs and risk implication component from the financial statement (Harjoto, 2017). Operating leverage measures the sensitivity (or elasticity) of profit with respect to sales, and varies directly with the proportion of fixed cost in total cost.

Concomitantly, Business risk is influenced by the variation in operating input such as; demand variability, Sales price variability, input price variability, Ability to adjust output prices for change in input prices, the extent to which cost are fixed (Akinsulire 2011). All these factors are determined partly by the company's industry characteristics. In other words, business risk is the riskiness of the firm's asset if it uses no debt. Conceptually, the firm has a certain amount of risk inherent in its operation related to the economic conditions in which it operates. e.g the business risk of public utilities is usually significantly less than that of manufacturing firms. This reflects the tendency for fluctuation in the demand for the services provided by utility companies such as electricity companies to be small relative to those experienced by industrial firms, whose demand for products tend to be unstable to the minimum. In a nutshell, the cost structure of a firm influences the operating leverage, the higher the fixed cost of operations, the greater the operating leverage. The impact of operating leverage on earnings is on short term when fixed cost of operation can be determined, fixed costs are unaffected cost irrespective of the variability in the volume of overall production (Brigham 1997). In the long run, all cost incurred by the firm are categorized as variable cost thus mitigate the effect of operating leverage on earnings (Goddess, 2007).

According to Briggs (1978), stock prices have been used as the only determinants of performance in the model. The value of firm can be measured from different perspective, depending on the horizon or the school of thought the researcher want to address in the study. The traditional measurement used to determine the firm value in most studies have been the accounting net worth. But the measurement is inconsistent due to the accounting principle of historical cost and conservatism. The second conventional measurement, value the firm based on the operation of the firm on the market floor and its outstanding shares. It is the most prominent method used in valuation of a firm that is already public listed on the stock exchange market. It usage employs an effective and efficient market shares.

Based on premises above the study would examine the impact of operating leverage on firm value using earning yield to measure the value of the firm.

## **2. Literature Review**

### ***2.1. Conceptual Review***

Operating Leverage is defined as the ratio of difference between fixed and variables cost of a firm on future earnings (Balakrishnan, Sivaramakrishman & Sprinkle, 2013). Operating leverage of the firm is strongly influenced by its cost structure, the higher the fixed cost of operation, the greater the operating leverage. The effect of operating leverage on earnings is just in the short –run when fixed cost of operation can be ascertained, fixed costs are unaffected costs irrespective of the change in the volume of overall production.

For operating leverage, the discussion typically centers on the break-even point the level of sales at which total revenues and expenses are equal and operating income is zero. This concept makes it possible to compare scenarios with differing levels of operating leverage and highlights the risk-return aspect; at higher volume levels, leverage pays off in the form of higher operating income, but at lower levels of volume, losses can be magnified. If is finance manager/management are optimistic about future economic conditions and about the demand for the firm's product, they are more likely to select highly automated production facilities, buy buildings and equipment, and hire fewer workers, perhaps on a salaried basis, all decisions that increase the fixed costs of doing business. If, on the other hand, the future holds uncertainty, the management might select less automation, rent their facilities and equipment, and hire more workers, perhaps paid by hourly wages. This high variable-cost, more labor-intensive

stance permits flexibility if demand is not materialized, because casual workers can be laid off. Similarly, a rental agreement or short-term lease is less binding than ownership. The competitive nature of the industry also plays a role. If the firm seeks to become a leader within its industry, perhaps a more highly levered posture will be required an assumption of higher risk in pursuit of higher returns.

Operating leverage is simply: categorized both variable and fixed costs; generate an income statement using a contribution margin format (Sales – Variable Costs – Fixed Costs = Operating Income, or Earnings Before Interest and Taxes); divide the contribution margin (Sales less Variable Costs) by Operating Income (also the contribution margin less fixed costs), and you produce the degree of operating leverage (DOL), a number greater than 1 (or equal to) 1.00. Because managers have access to all costs and their behavior patterns (given the aid of their cost accountants) this is fairly routine matter. External financing reporting however, does not categorize cost information in this manner, so it is quite a different matter for external analysts to gauge the degree of operating leverage. The interpretation of degree of operating leverage of say, 1.60 is for every 1.00 % change in volume, the operating income will increase by 1.60%; higher leverage offers higher potential return and lower leverage will offer lower potential return and business risk. One complicating factor is that this measure will differ in magnitude depending on how close a firm is operating to its break-even point. For external users attempting to compare firm this poses additional problem.

According to Watson & Head (2010), operating leverage provides a vivid explanation of the extent to which an organization relies on fixed costs in its quest for maximizing its operating profit. It should be noted that, an increase in profits is as a result of controlling the fixed cost components of the company such that the total revenue covers a higher margin than the fixed cost of the product. That is, when operating leverage continue to increase, there is the likelihood of an equal proportional increase in the fixed operating cost of the company which has the propensity of decreasing the margin of the operating profit of the organization in the long run. In effect, if the variable cost component is predominant among the operating cost of the organization then there is also the likelihood that the operating leverage of the company will decline and a comparable effect can be envisaged on the net profit for a company with a high degree of financial leverage.

However, operating leverage and financial leverage combine in a multiplicative form to bring about a more proportion change in earnings per share for a given percentage change in activity this is the total leverage or composite leverage. The latter arise the dispersion and risk of possible earnings are increased. With the presence of fixed operation costs and fixed financing costs, a given changes in sales is translated into a larger relative changes in earnings per share through a two-step magnification process.

Firm's Valuation and Value is essential for deriving stock prices, an item of significance in many models (Key & Briggs 1990). According to Briggs (1978), stock prices sometimes is the sole measure of performance in the model. More commonly it is a major components of weighted average that includes other measure. The value of firms can be obtained through different measures, each of which is likely to give a value that differs from that obtained by another. The traditional or most readily available measure of the value of firm is its accounting net worth or book value. The measure is problematic, due to principle of historical cost and conservatism. The second measure is the market value of all its outstanding shares. This is a popular method of valuating public corporations. Its application however requires an efficient real market for shares. This condition is not met in models that do not allow participants to trade shares, and even when such trading is allowed, the trades are generally too few and too infrequent for reliable valuation. The third measure is the capitalized value of its projected future performance.

Modigliani and Miller (1961) pointed out that although four distinct method of capitalization can be applied for this purpose, all four give rise to precisely the same valuation when the markets are perfect, People are completely rational, and the future is known with perfect certainty. However, the capitalized valued measure has a problem as it requires at least one arbitrary parameter ( $m$ ), if the Goosen's method is applied. The fourth measure is the deductive application of human judgment. With this method, firms are rated along a psychometric scale. The results are then converted by formula to monetary values. The problem of this measure is that it requires subjective judgment. The fifth measure is the firm's accounting net worth adjusted for intangible and the idiosyncrasies of accounting rules used in the simulation. Although general principle could be laid out for the adjustment, the specific principle must depend upon the particulars of the model.

## 2.2. Theoretical Review

### The Break-Even Model

Operating leverage includes business risk. Generally, increase in leverage result in increase in risk and return, whereas decrease in leverage result in decreases in risk and return. There are three cost classification that firm induce in their activity which are variable cost (a cost that changes in total naira amount with the change in the level of activity), fixed cost (a cost that does not change, in total with the change in activity or output) and mixed cost. The break-even model aid to study the relationship between fixed cost, variable cost, sales volume (activity) and profit. Also called the cost/volume/profit analysis (CVP analysis) (Judith, 2010). The break-even helps to predict the attribute of business risk exposure, employed by the operating leverage ratio of an industry attribute and in industry having its own firm characteristics. Business risk depends on the extent to which a firm builds fixed costs into its operation. Operating leverage is simply the employment of an asset for which the firm pays a fixed cost. Concurrently, any time a firm has a fixed cost that must be met, regardless of the output, operating leverage occurs. Operating leverage operates that short-run analysis. Since at the long-run all cost are variable. A firm acquires a fixed cost asset in the hope that the volume of the firm will produce revenue more than sufficient to cover all fixed and variable cost. Moreover, variable cost varies directly with level of output, while fixed cost does not vary as volume/output changes. The variable cost include general and administrative expenses, direct selling commissions, raw material, and direct labor costs are part of overall utility bills. The fixed cost include depreciation of buildings and equipment, insurance, property taxes, part of the overall utility bills and portion of the cost of management (Akingunola, 2016). With the static costs, the percentage change in profits accompanying a change in volume is greater than percentage change in volume. The phenomenon is known as operating leverage. If fixed costs are high even a small decline in sales can lead to a large decline in EBIT (operating profits), the higher a firm's fixed costs, the lowers its business risk while the lower a firm's fixed cost, the lower it business risk. Higher fixed cost are generally associated with more highly automated, capital intensive firms and industries and lower fixed costs are generally associated with less capital intensive firms. If a percentage of total cost is fixed, then the firm is said to have a high degree of operating leverage.

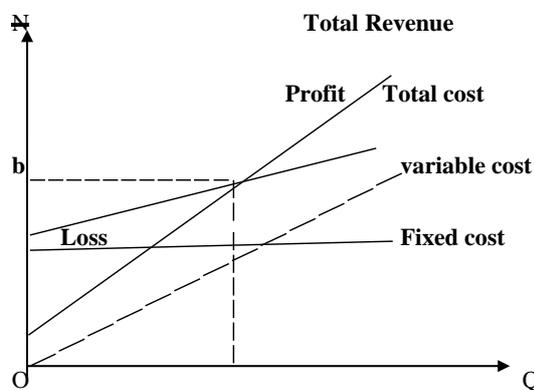


Fig.1 Break Even Analysis

From above diagram, the intersection of the total costs line with the revenue line represents the break-even point. The fixed costs that must be covered from the revenue after deduction of variable costs determine the volume necessary to break even.

At the break-even point, variable cost plus fixed cost equal total revenue.  $FC + VC(X) = P(X)$

Where X= Volume of output (in units)

F= Fixed costs

V= Variable costs per units

P= Price per units

In a nutshell, Operating leverage centers on the breakeven analysis. The break-even point represents the level which total revenue and expenses are equal, influenced by sales level, while operating income is zero. The break-even analysis depicts the intersection of the total costs line with the revenue line represents the break-even point. The break-even points is peculiar to an industry-firm characteristics and low/high growth performance.

### ***2.3. Empirical Review***

Kajola, Alao, Sanyaolu & Ojuringbe (2020) examined the effect of liquidity and leverage on financial performance of Nigerian listed consumer goods firms. The sample size of the study was selected from seventeen consumer goods firms listed on the Nigerian Stock Exchange. The time period was within 2012-2017. The pooled regression technique was employed to determine the econometric relationship of the dependent variables and independent variables. The findings of the study revealed that degree of operating leverage and degree of combined leverage has significant effect on financial performance while current ratio and quick asset ratio has significant effect on financial performance. The study was unable to give a vivid distinction between financial performance and firm value using EPS (Earning per share) to measure financial performance may not have indicated EPS (Earning per share) has a firm value proxy and not financial performance which looks from the holistic perspectives. Also using degree of operating leverage and combined leverage, does not aid to expose or capture the risk and cost implication in terms of measurement.

Ghozali, Handriani & Hersungodo (2020) investigates into the most germane determinants of leverage in the Indonesia manufacturing firms. The sample size of (300) three hundred manufacturing firms listed in Indonesia Stock Exchange within 2010- 2018. The hypothesis was drawn from the theoretical framework of Modigliani & Miller (1958) and Pecking Order Theory. The major findings of the study indicate that bankruptcy cost, firm size, firm growth and risk measurements has positive influence on the debt ratio. The study suggests that the Indonesia manufacturing sector should cling to the pecking order postulation that fund from internal environment of firms should be employed in executing Net present value project. The study can be made robust by looking at the debt ratio from the period perspective in terms of short-term, medium- term and long-term. Leverage is an umbrella in finance terminologies that covers the financial, operating and combined leverage, than using the debt ratio alone (financial leverage).

Li, Li & Zeng (2020) examined into the influence of contraction flexibility, operating leverage and financial leverage from the school of thoughts of internal, ownership and agents conflicts of shareholders and debt holder's. The study added to literature by creating a link with financial leverage with operating flexibility, including production flexibility. Giving a concise role of debt governance in alleviating agency problems. The findings of the high proportion of banks loans or long-term debt in total liabilities can help levered firms alleviate the agency problem arising from contraction decisions.

Grau & Reig (2019) analyses the effect that operating leverage exerts on the profitability of small and medium Scale enterprises. The panel regression and data from 2009- 2016 was employed. The bane of the study is considering relevance of SME's in their economic development proponent while considering their institutional and legal environment. The findings suggest that operating leverage does not only influence profitability, but also affect other sources of risk like indebtedness, size, innovation which are all depending on the level of operating leverage of the company.

Orajaka (2017) investigated into the impact of leverage financing on financial performance of manufacturing firms in Nigeria Stock Exchange. The sample size of four (4) companies was used, which data was gathered from their financial statement. The regression technique was used to validate the relationship dependent and independent variables in the applied study. The findings revealed that return on equity is significant to return on assets, Net profit margin and Asset Turnover. Net Profit Margin is also significant to Return on Equity, Return on Assets and Assets Turnover. Also Assets Turnover is significant to Return on Equity, Return to Assets and Net Profit Margin.

Kogan, Li & Zhang (2019) examines the relationship between operating hedge and gross profitability premium. The study explains into the hedging effect induced by intermediate inputs in production and it's impacts on fundamental risk of firm cash flow and stock returns. The occurrence of hedging changes with respect to firms and has weaker preference for more profitable firms. This situation allows profitable firm have high exposure to aggregate profitability shocks giving rise to a gross profitability premium.

Chen, Harford & Kamara (2018) examines operating leverage, profitability and capital structure. The study employed the pooled regression technique. The findings suggest that operating leverage increase profitability and reduces optimal financial leverage and thus that operating leverage generates negative relation between profitability and financial leverage that is thought to be inconsistent with trade-off theory.

Uremadu & Onykechi (2019) investigated into the impact of capital structure on corporate performance in Nigeria. The multiple regression technique was used to analyze the data. The results from the study showed a negative and insignificant impact of capital structure on corporate performance of the consumer goods firm sector of Nigeria. That long-term debt ratio to total asset had a negative and insignificant impact on returns on assets, while total debt ratio to equity also had a negative and insignificant impact on returns on assets. The study, therefore, concluded that capital structure is not a major determinant of firm performance. Hence, the study recommends that managers should be careful while using debt as a source of finance since a negative impact exist between the capital structure and corporate firm's performance. Also, that corporate firms should try to finance their activities with retained earnings and use debt as a last option as this is consistent with the pecking order theory. This implies that, the study strongly recommends that corporate firms should use more of equity than debt in financing their business activities, this is because in spite of the fact that the value of a business can be enhanced with debt capital, it gets to a point that it becomes detrimental (negative) or unfavorable to the business.

Akingunola (2016) posited a theoretical justification on the impact of financial leverage, operating leverage and return. The study modeled an econometric model which can be used to investigate the impact of corporate leverage on return. The study concluded based on the happenings in the Nigerian Business Environment that the Modigliani and Miller 1958 theory is not inconsistent.

### 3. Methodology

This research work utilizes a descriptive research design which is ex-post facto nature, relying on secondary data obtained after the occurrence of the event which the researcher has no control over. Both inferential and descriptive statistics are relied on to examine effect of operating leverage on firm value of manufacturing quoted firms on the Nigeria Stock Exchange (consumer goods sector).The data required for the study include; Earning yield (EY), (OPLE) Operating leverage in asset and (VAS) Variability in sales. The data for the study was gathered from the financial statement of the firm and other various publication related to the study. The analytical method of data was panel regression technique (Hausman, Random and Fixed Effect Model).

#### 3.1. Model Specification

This model was adapted and adjusted to suit the present study from the study of Enekwe, Agu & Eziedu (2014) and Akingunola (2016).

$$EY_t = f(OPLE, VAS, VPBIT) \dots\dots\dots 1$$

$$EY_{i,t} = (\alpha_0 + \beta_1 OPLE_{i,t} + \beta_2 VAS_{i,t} + \beta_3 VPBIT_{i,t} + \mu_t) \dots\dots\dots 2$$

Where;

EY; Earning Yield.

OPLE; operating leverage in asset

VAS; Variability in sales

VPBIT: Variability in profit before interest and Tax

U= Disturbance term/White noise at time t

i= nth term

$\alpha$  = Intercept

$\alpha_1- \alpha_3$  = Coefficient of the Independent Variables.

**3.2 Table 1: Description of Variables**

<b>Variables</b>	<b>Description</b>	<b>Measurement</b>
<b>Dependent Variable</b>		
EY	It refers to the earnings per share for the most recent twelve (12) month period divided by current market price per share. it is the inverse of P/E	It measured by Earnings per share EPS/ Market price per share.
<b>Independent Variables</b>		
OPLE	Operating leverage in asset is the residuals, that aid to depict the variable component of the firm that will influence return	it is measured by Fixed asset/Total asset.
VAS	Variability of Sales is the extent of dynamism of turnover of a firm, which aid to depict the extent of its risk exposure and investment prospects.	it is measured by (Standard Deviation of Sales). Akingunola (2016)
VPBIT	Variability of Profit before interest and Tax is the variability of earnings of a firm, before interest on creditor and tax. it is the variability that will help to depict the true contribution margin of the variability of cost on the return.	it is measured by (Standard deviation of PBIT).

Author's Compilation, 2019

#### 4. Data Presentation, Analysis and Discussion

This section summarizes the data collected and the statistical method of analysis, using the methodology adopted in the prior chapter. The 48 respondents engaged in this study were: one (1) Finance Director; one (1) Directors at the Internal Audit Unit; one (1) Director (Management); one (1) manager (HR); three (3) staff of the Internal Audit Unit; seven (7) from Accounting and Finance Department; four (4) staff from the Human Resource Department; three (3) from general administration; nine (9) staff from the Procurement and Logistics Department; and eighteen (18) Field officers.

##### 4.1. Results and Discussions of Findings

This section deals with the analysis and discussion of empirical findings. This covers the descriptive statistics, correlation matrix, Hausman Test and fixed & Random Effect Model.

**Table 2: Showing the Descriptive Statistics**

	<b>EY</b>	<b>DVAS</b>	<b>DVPBIT</b>	<b>OPLE</b>
<b>Mean</b>	9.294466	5.745515	0.540681	0.542242
<b>Median</b>	3.383115	0.124714	0.059526	0.518948
<b>Maximum</b>	150.5775	388.4643	31.34843	1.659695
<b>Minimum</b>	0.001745	0.000000	0.000000	0.059396
<b>Std. Dev.</b>	21.77029	46.40732	3.737475	0.290566
<b>Skewness</b>	4.650516	8.185845	8.173616	1.595719

<b>Kurtosis</b>	27.95858	68.01026	67.87787	6.686070
<b>Jarque-Bera</b>	2069.199	13108.57	13056.08	69.33614
<b>Probability</b>	0.000000	0.000000	0.000000	0.000000
<b>Sum</b>	650.6126	402.1860	37.84770	37.95693
<b>Sum Sq. Dev.</b>	32702.23	148601.1	963.8419	5.825588
<b>Observations</b>	70	70	70	70

Author's Compilation, 2019

The above table depicted the descriptive statistics used in the study. EY (Earnings yield) has a mean value of 9.29%, median value of 3.38% and standard deviation which is a variation from the mean value to be 21.7%. DVAS (Variability in Sales) has a mean value of 5.74%, median value of 0.12% and Standard deviation which is a variation from the mean value to be 46.4%. DVPBIT (Variability in profit before interest and tax) has a mean value of 0.54%, median value of 0.05% and Standard deviation which is a variation from the mean value to 3.73%. OPLE (Operating leverage in asset) has a mean value of 0.54%, median value of 0.51% and standard deviation which is a variation from the mean value of 0.29%. The minimum value and maximum value of the variable include the following: EY (Earning yield) has a minimum value of 0.00 and maximum value of 150.5. DVAS (Variability in Sales) has a minimum 0.00 and maximum value of 31.4. DVPBIT (Variability in profit before interest and tax) has a minimum value of 0.00 and maximum value of 31.3. OPLE (Operating leverage in asset) has a minimum value 0.05 and maximum value of 1.65. The skewness in the variable include EY (Earning yeild) mirrors a long-tailed (positive skewness) at 4.65. DVAS (Variability in Sales) mirrors long-tailed (positive skewness) at 8.18. DVPBIT (Variability in profit before interest and tax) mirrors a long-tailed (positive skewness) of 8.17. OPLE (Operating leverage in asset) mirror a normal skewness at 1.59. The Kurtosis in the variable include: EY (Earning yield) is leptokutic at 27.9, since  $(27.9 > 3)$ . DVAS (Variability in sales) is leptokutic at 68.0, since  $(68.0 > 3)$ . DVPBIT (Variability in profit before interest and tax) is leptokutic at 67.8, since  $(67.8 > 3)$ . OPLE (Operating leverage in asset) is leptokutic at 6.68, since  $(6.68 > 3)$ . The Jarque-Bera Statistics include: EY (Earning yield) is 2069.1 at 0.00 which is indicating the variable is normally distributed. DVAS (Variability in sales) is 13108.5 at 0.000 which is indicating the variable is normally distributed. DVPBIT (Variability in profit before interest and tax) is 13056.0 which is indicating the variable is normally distributed 0.000. OPLE (Operating profit in asset) is 69.33 which is indicating the variable is normally distributed 0.00.

**Table 3: Correlation Matrix**

	EY	DVAS	DVPBIT	OPLE
EY	1.000000			
DVAS	-0.049818	1.000000		
DVPBIT	-0.050261	0.999507	1.000000	
OPLE	-0.037816	-0.201746	-0.202762	1.000000

Author's Compilation, 2019

Table 3 above show the correlation among the variables used in the study: EY (Earning yield) has a negative relationship with DVAS (Variability in sales) at -0.04, DVPBIT (Variability in profit before interest and tax) at -0.05 and operating leverage in asset at -0.03.

**Table 4: Regression Analysis**  
**Dependent variable: Earnings yield (EY)**

<b>Variable</b>	<b>Pooled</b>	<b>Fixed</b>	<b>Random</b>
<b>C</b>	11.7508 (0.0599)	21.5951 (0.0008)	18.7369 (0.0101)
<b>DVAS</b>	0.2213 (0.9044)	-1.4842 (0.5601)	-1.0466 (0.6026)
<b>DVPBIT</b>	-3.0994 (0.0923)**	18.259 (0.5633)	12.6645 (0.6115)
<b>OPLE</b>	-3.7848 (0.6884)	-25.1647 (0.0177)*	-18.9514 (0.0427)*
<b>R<sup>2</sup></b>	0.2951	0.4834	0.3616
<b>Adjusted R<sup>2</sup></b>	0.2400	0.3011	0.3189
<b>Durbin Watson</b>	1.1378	2.0231	1.7240
<b>F-Statistics</b>	0.1138	2.6516	1.444
<b>Prob (F-statistics)</b>	0.9516	0.0032	0.0378
<b>Hausman Test</b>	0.3485		

p<0.05\*; p<0.1\*\*

The pooled regression model results depicts that DVAS (Variability in sales) has a positive relationship with EY (Earning yield) of selected manufacturing companies in Nigeria and statistically insignificant to EY (Earning yield) which implies that a percentage increase in DVAS (Variability in asset) will lead to 0.22 increase in EY (Earning yield). DVPBIT (Variability in profit before interest and tax) has a negative relationship with EY (Earning yield) of selected manufacturing companies in Nigeria and statistically significant to EY (Earning yield) which implies that a percentage increase in DVPBIT (Variability in profit before interest and tax) will lead to 3.09 decrease in EY (Earning yield). OPLE (Operating leverage in asset) has a negative relationship with EY (Earning yield) of selected manufacturing companies in Nigeria and statistically insignificant to EY (Earning yield) which implies that a percentage increase in OPLE (operating leverage in asset) will lead to 3.78 decrease in EY (Earning yield).

The coefficient of determination using adjusted R<sup>2</sup> shows that the explanatory variables (DVAS, DVPBIT and OPLE) explained 29.51% percent variation in manufacturing firms in Nigeria. That is 70.49% is explained by other variables not included in the model. The overall statistical level of the model depicts that the model is not fit for forecasting giving the F-statistics of 11.38 and its probability of 0.9516 Since the p-value is higher than 0.05, hence we conclude that the model is statistically insignificant and brings about the acceptance of the null hypothesis. This means that variability in sales, variability in profit before interest and tax and operating leverage in asset have an insignificant effect on consumer manufacturing firms in Nigeria.

The fixed regression model results depicts that DVAS (Variability in sales) has a negative relationship with EY (Earning yield) of selected manufacturing companies in Nigeria and statistically insignificant to EY (Earning yield) which implies that a percentage increase in DVAS (Variability in asset) will lead to 1.48 decrease in EY (Earning yield). DVPBIT (Variability in profit before interest and tax) has a positive relationship with EY (Earning yield) of selected manufacturing companies in Nigeria and statistically insignificant to EY (Earning yield) which implies that a percentage increase in DVPBIT (Variability in profit before interest and tax) will lead to 18.2 increase in EY (Earning yield). OPLE (Operating leverage in asset) has a negative relationship with EY (Earning yield) of selected manufacturing companies in Nigeria and statistically significant to EY (Earning yield) which implies that a percentage increase in OPLE (operating leverage in asset) will lead to 25.1 decrease in EY (Earning yield).

The coefficient of determination using adjusted R<sup>2</sup> shows that the explanatory variables (DVAS, DVPBIT and OPLE) explained 48.34% percent variation in manufacturing firms in Nigeria. That is 51.66% is explained by other variables not included in the model. The overall statistical level of the model depicts that the model is fit for

forecasting giving the F-statistics of 2.65 and its probability of 0.0032 since the p-value is less than 0.05, hence we conclude that the model is statistically significant and brings about the rejection of the null hypothesis. This means that variability in sales, variability in profit before interest and tax and operating leverage in asset has a significant effect on consumer manufacturing firms in Nigeria.

The random regression model results depicts that DVAS (Variability in sales) has a negative relationship with EY (Earning yield) of selected manufacturing companies in Nigeria and statistically insignificant to EY (Earning yield) which implies that a percentage increase in DVAS (Variability in asset) will lead to 1.04 decrease in EY (Earning yield). DVPBIT (Variability in profit before interest and tax) has a positive relationship with EY (Earning yield) of selected manufacturing companies in Nigeria and statistically insignificant to EY (Earning yield) which implies that a percentage increase in DVPBIT (Variability in profit before interest and tax) will lead to 12.6 increase in EY (Earning yield). OPLE (Operating leverage in asset) has a negative relationship with EY (Earning yield) of selected manufacturing companies in Nigeria and statistically significant to EY (Earning yield) which implies that a percentage increase in OPLE (operating leverage in asset) will lead to 18.9 decrease in EY (Earning yield).

The coefficient of determination using adjusted R<sup>2</sup> shows that the explanatory variables (DVAS, DVPBIT and OPLE) explained 36.16% percent variation in manufacturing firms in Nigeria. That is 63.84% is explained by other variables not included in the model. The overall statistical level of the model depicts that the model is fit for forecasting giving the F-statistics of 1.44 and its probability of 0.0378 since the p-value is less than 0.05, hence we conclude that the model is statistically significant and brings about the rejection of the null hypothesis. This means that variability in sales, variability in profit before interest and tax and operating leverage in asset has a significant effect on consumer manufacturing firms in Nigeria.

The result shows the Hausman test diagnostic which depicts the appropriate model for forecasting. The result shows that the appropriate model for forecasting is the random effect as the Hausman test with F (p-value) of 0.3485 shows the acceptance of the alternative hypothesis of the random effects. Hence, we accept the estimation of random effect for forecasting. There is a need to further check the appropriateness of the random-effect model.

## 5. Conclusion and Recommendations

This study investigated the effect of operating leverage of firm value of quoted manufacturing firms in Nigeria. The study established that earning yield is dependent on variability in sales, variability in profit before interest and tax and operating leverage in asset. Based on the random effect model. Variability in sales ( $\Delta$ VAS) and (OPLE) Operating leverage in assets has a negative effect on of firm value (earnings yield), while VPBIT (Variability in profit before interest and tax) has positive effect on firm value (earning yield). Operating leverage in asset has a significant effect on firm value. The findings is consistent with the findings of Pradeep & Shailendra (2016). It is therefore recommended that firm's would benefit from the quick variability in fixed asset to current asset. Changes in fixed cost into variable cost influences sales and long-run term profit. But must make sure, this variability is recouped back as soon as the profit is earned, because the total asset valuation also depicts the goodwill of a firm and not to be carried away with demand of sales/turnover providing room strength at the occurrence of bankruptcy/liquidation treat.

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