INTERFACE OF LEVERAGE AND EARNINGS: AN INVESTIGATION INTO THE NIGERIA MANUFACTURING SECTOR, CASE OF NIGRIA BREWERIES PLC

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ABSTRACT

There is no doubt that financial and operating leverage are important because of the way these factors exert significant effect on the level and variability of returns, and consequently on the overall risk of a firm. An efficient mix of the two factors will minimize the incidence of business risk and financial risk. This work is concerned with assessing the variability in the stream of the firms' residual earnings induced by the use of operating and financial leverages. The study has empirically employed the use of multiple regression analysis to investigate the impact of the two leverages on earnings and the emphasis is on the manufacturing sector. The result shows that sales, operating leverage, financial leverage and combined leverage have significant influence on earnings of NB Plc from 1979 – 2004.

INTRODUCTION

Firms operate financial and operating leverages in various degrees. The joint use of financial and operating leverages can be measured by calculating the degree of the combined leverage. Samuels and Wilkes (1981:158 - 159), defines **Operating leverage** as the proportion of change in earnings due to change in the level of sales volume. Further, it relates to the way in which a change in the level of sales of a company affects operating profits. **Financial leverage** is a company's practice of the acquisition of part assets of the company with fixed interest capital with the hope of increasing the end result of the common stock holders (Oloyede, 2000:134). The combined leverage is the product of both operating leverage and financial leverage. Against this backdrop, the finance manager is able to ascertain the effect on total leverage caused by adding financial leverage to operating leverage.

The degree of combined leverage brings either positive or negative impact on an organization. Like financial leverage, operating leverage is one of the components of the firm's risk. Corporate risk can be classified into business risk and financial risk. Business risk refers to the relative dispersion (variability) in the firm's Earnings Before Interest and Taxes (EBIT) and it has a direct impact on the firm's investment decision. Financial risk is a direct impact on the firm's investment decision. Therefore, in selecting a proper financial mix, an organization is expected to consider the effect in variability in earnings that will be available to the shareholders, and the additional chance of insolvency borne by the common shareholder as a result of the use of financial leverage. Because the consequences of business risk are variability or uncertainty of sales and of production costs, operating leverage seems to magnify the impact of these factors on the variability of profits. Considering the central position of operating leverage in the firm's cost structure, a financial manager is expected to always consider the effect of an increase in fixed costs associated with a new machinery and a reduction in variable costs attributable to a lower labour bill. Where there is prospect for future sales increase, increasing the degree of operating leverage might be wise decision. Operating leverage is only one factor for the course of variability; therefore, knowledge of the operating and financial leverage concept will assist the financial manager in making alteration in the firm's cost structure. The relevance of financial leverage is that high leverage can discourage investors and also put a firm in a disadvantage position. Oloyede (2000:133) refers to the practice of financing a proportion of the firm's assets with fixed interest bearing securities with the hope of increasing the ultimate return to the common shareholder. Financial leverage varies with the fluctuations in earning per share and it has the following advantages:

i. A proportionate increase in earning per share will lead to a greater than proportionate increase in the cost of equity.
ii. A positive financial leverage occurs when the profits of the firm increases because while a negative financial leverage leads to decrease profits arising from the injection of debt.

In this study, we begin with introduction above, objective of study, statement of problem and research questions. Subsequently, we dwell on review of earlier literatures and considered a theoretical framework. We proceed by focusing on research methodology, data collection, presentation and the discussions of findings.

1.2 STUDY OBJECTIVE

The broad objectives of this study are:

i. To investigate if the use of operating and financial leverage has significant impact on the earnings of the organization.
ii. To investigate the variability of operating leverage in turnover.
iii. To consider impact of combined leverage on earnings per share.

1.3 SATEMENT OF PROBLEM

The cost of capital is affected by the composition of its financial structure. Financial and operating leverage is very critical in the process of arriving at an appropriate financial structure. The introduction of the Structural Adjusted Programme in Nigeria in 1986 led to the Interbank Foreign Exchange Market (IFEM) consequent upon which the forces of demand and supply now determine the exchange rate. The exchange rate of the Nigerian naira against the major currencies, the dollar and pound sterling had nose-dived leading to high cost of importation of raw materials and equipment. This has also led to under capacity utilization. It is against this background that the study of leverage with respect to performance of the manufacturing sector becomes pertinent.

1.4 RESEARCH QUESTIONS

The study seeks to proffer solutions to some important questions and form a basis in formulation of the hypotheses. The questions stated below are important:

1. Is operating leverage affected relative to differential sales bases?
2. Does operating and financial leverage affect company Earnings Per Share?
3. How do the twin factors affect earnings?
4. What impact does sales have on earnings?

These we will attempt to discus in this study.

2.1 LITERATURE AND THEORETICAL FRAMEWORK

The degree of operating leverage (DOF) is the percentage in net operating income associated with given percentage change in sales volume (Brigham 1985: 529-533). The degree of operating leverage shows the sensitivity of net income to changes in EBIT. Where operating leverage causes a change in sales volume, it will have effect on EBIT.

The financial leverage is superimposed on operating leverage, changes in EBIT will have positive effect on both net income available to common stockholders and earnings per share. Therefore, if a firm uses a considerable amount of both operating leverage and financial leverage, a small change in the level of sales will result in wide fluctuations in net income and EPS. The primary motive of company in using financial leverage is to increase shareholders' return under favourable conditions (Pandy, 2002: 637-638). Financial leverage will enhance shareholders return on the condition that fixed charges fund (such as the loan from financial institutions and other sources or debentures) can be obtained at cost lower than the firm's rate of return on net assets (RONA or ROI). Where the difference between the earnings generated by assets financed by the charges funds and costs of these funds is distributed to shareholders, the earnings per share (EPS) or return on equity (ROE) increases. EPS or ROE will decrease if the company obtains fixed charges fund at a cost higher than the rate of return on the company's assets. Therefore, EPS, ROE are important factors for analyzing impact of financial leverage.

In deriving the degree of operating leverage, we assume that P, F and V are constant, that they do not change in output. High degree of operating leverage, other factors held constant, implies that a small change in sales will result in large change in operating income (Brigham, 1985:226-230). The higher a company's operating leverage, the higher the business risk factor. The more operating leverage the company has, the greater the potential for large swings in the company's operating profits. Operating leverage, the commitment to fixed production charges will add to beta of a capital project (Myers, 2003:239-240). Fixed costs are cash outflow that occur regardless of whether the asset is active or idle. Favourable leverage is a situation in which EPS rises as a result of introduction of debt into capital. Unfavourable leverage is a situation in which EPS decreases as a result of debt introduced into the capital structure.

Financial leverage is a change in EPS caused by the use of fixed payment securities to finance a company's operations. Business risk and financial leverage have impact on the leverage of an organization. However, business risk depends on the industry to which a firm or company belongs and on general economic conditions. Financial risk is the additional variability of earnings induced by leverage. The impact of financial leverage given the relative assumption that uncertainty prevails, can be reduced to three alternatives:

i. Situation in which leverage increases risk, but at the same time decreases expected EPS
ii. Neutral situation in which the increase in risk following the introduction of leverage leaves EPS unchanged
iii. Situation in which the introduction of leverage increases expected EPS and risk simultaneously.

Keown (2003:366-367) opined that financial structure is the mix of all items that appear on the right hand side of the company's balance sheet. Capital structure is the mix of the long-term sources of funds used by the company. Capital structure is the mix of the long-term sources of funds used by the company.

The assets owned by the firm affect the maturity profile of financial plans. A company heavily committed to real capital investment, represented primarily by fixed assets on its balance sheet, should finance those assets with permanent (long-term) types of financial capital. Permanent portion of the firm's investment in current assets should likewise be financed with permanent capital. The firm's cost of equity rises when the firm increases its use of financial leverage because the financial risk of the equity increases while the business risk remains the same (Westerfield, Ross, 2000:496). The total systematic risk of the firm's equity has two parts: business risk and financial risk. The first part (the business risk) depends on the firm's asset and operations and is not affected by capital structure. Given the firm's business risk (and its cost of debt), the second part (the financial risk) is completely determined by financial policy.

3.1 METHODOLOGY

This section seeks to highlight or spell out in detail the research design adopted in the entire study and to test the hypotheses formulated. The data collected for this study consists of primary and secondary sources data. Twenty-Six years historical data collected from the financial statement is used in the analysis of this paper. Multiple regression using the ordinary least square (OLS) is employed to test the relationship. The remainder of this section is divided into various sub-sections:

- Scope
- Hypotheses
- Model Specification
- Measurement of Variable and Data Sources
- Data Analysis, Presentation and Results

Scope

The period covered in this study is 1979-2004 and the data were obtained from Nigerian Brewery Annual Reports. The analysis covers only a specific section of the manufacturing sector that is NB Plc.This is done in order to have a more penetrating result.

Test of Hypotheses

(i) Operating leverage has no significant influence on earnings of NB Plc.

(ii) Financial Leverage ha s no significant influence on earnings of NB Plc.

(iii) The expected value of financial and operating leverage has no significant influence on earnings of NB Plc.

(iv) Sales have no significant influence on earnings.

Table 1

NIGERIAN BREWERIES PLC

Measures of leverage According to Different Sales Bases and Earnings Before Interest and Taxes

Year	**Sales** =N='000 X_4	**EBIT** =N='000 Y	**Financial Leverage=**N='000 X_2	**EPS**	**Operating Leverage=**N='000 X_1
1979	155,800	32,318	69,316	19.5k	81,746
1980	174,207	40,304	73,036	24.4k	103,613
1981	187,636	38,532	65,682	28.1k	139,731
1982	241,097	53,887	89,296	33.2k	161,115
1983	317,387	95,652	132,996	28.80k	157,528
1984	322,125	104,158	136,389	32.27k	147,668
1985	179,109	41,566	68,805	15.47k	141,004
1986	205,476	45,387	74,744	16.07k	141,752
1987	341,047	75,774	96,095	28.36k	153,821
1988	514,992	138,431	162,987	45.49k	168,334

1989	514,992	227,040	204,651	54.64k	520,788
1990	811,052	274,562	330,824	63.55k	819,714
1991	1,1179,539	442,501	466,571	108.22k	932,214
1992	1,708,559	684,625	734,271	167.65k	1,398,099
1993	1,969,150	458,056	135,457	100.31k	680,931
1994	7,142,601	2,204,008	2,400,458	149.65k	2,526,440
1995	10,768,180	2,506,821	3,456,756	194.38k	11,378,748
1996	12,256,731	2,581,465	14,037,600	95k	10,965,050
1997	10,886,950	2,406,396	3,602,491	84k	10,714,122
1998	9,186,869	3,231,043	1,096,005	113k	10,538,663
1999	12,033,111	5,268,116	1,701,140	184k	11,521,472
2000	25,575,545	6,481,065	401,924	225k	12,074,011
2001	39,091,435	10,035,471	2,546,120	240k	15,287,003
2002	48,584,892	12,553,245	2,170,816	193k	37,022,763
2003	62,974,995	13,060,877	2,068,830	194k	50,041,941
2004	73,594,134	14,425,769	5,277,630	67k	54,448,027

Source: Compiled By the Researchers From NB Plc Financial Statements

Model Specification

In an attempt to investigate the relationship between leverage and earnings of NB Plc, earning is postulated as a function of operating leverage, financial leverage and combined leverage. This study adopts a disequilibrum model, which takes the state of affairs of the period (financial statements) under review. (See table 1). The ordinary least square (OLS) is used to test the relationship.

Measurement of Variable and Data Sources

For the purpose of estimating equation 1, the least square method is used to ascertain the impact of leverage on earnings as shown in table 1 of NB Plc. It is assumed in this study that leverage has inhibited earnings of NB Plc. This implies that there is a direct relationship between earnings and leverage. This would assist us to show the relationship between earnings and leverage for the period covered. The sources of various secondary data used in this study are the financial statements of NB Plc (various issues). These data covers the period 1979-2004.

4.1 DATA ANALYSIS, PRESENTATION AND DISCUSSION

Two types of leverage can be identified in financial management, namely: (i) that which is due to fixed costs associated with the production of goods or services, called operating leverage and (ii) that which is due to the existence of fixed financing cost like interest on a loan called financial leverage. For the data on table 1 above, financial leverage is inclusive of excise duty charges because of the magnitude. A third type is the combination of both operating leverage and financial leverage captured in the regression result on table 2. (See below). The theoretical formular for calculating the leverages are represented below

Table 2: Main Findings

Ordinary Least Square Estimate for the Equation

Dependent Variable: Earnings

		Explanatory variables				**Summary Statistics**			
	Constant	Operating	Financial Leverage	Combined Leverage	Sales	RL:	DW	F. Stat	Adj R^2
	119699.1 (0.69323)	.0063523 (0.147691)	0.18819 (2.5524)	0.2056 E-7 (-3.7811)	0.25321 8.6797	0.9814	2.1377	276. 65	0.978
Std. Error	172667.8	0.043010	0.073732	0.5438 E-8	0.029173				
Prob.	0.496	0.884	0.019	0.0001	0.000			0.000	
	Notes: T – Values are in parenthesis 0.000 Significant level at 5%.								

Degree of Operating Leverage (DOL)

It is defined as the percentage change in profit against change in output (Sales).

$$DOL = \frac{\%\ \text{Change in Profit}}{\%\ \text{Change in Output}}$$

Alternative;

$$\frac{Q\ (P-VC)}{Q\ (P-VC) - FC}$$

Where: VC = Variable Cost per unit

FC = Fixed Costs

P = Price Per Unit

Q = Volume of Output (Sales)

Degree of Financial Leverage (DFL)

This is the change in proportion of the Earnings per share relative to EBIT

$$DFL = \frac{\%\text{Change in EBIT}}{\%\text{ Change in EBIT-1}}$$

$$\text{i.e } DFL = \frac{Q\,(P-VC) - FC}{Q\,(P-VC) - 1}$$

Where I is the interest element

Degree of Combined Leverage

This is the product of both Degree of Operating Leverage and Degree of Financial Leverage i.e. DOF x DFL:

$$\frac{Q\,(P-VC)}{Q\,(P-VC) - FC} \times \frac{Q\,(P-VC) - FC}{Q\,(P - VC) - FC - I}$$

$$= \frac{Q\,(P-VC)}{Q\,(P-VC) - FC - I}$$

Case of Multiple Regression

$Y = a + bx_1 = cx_2 + dx_3 + ex_4$ ….. Equation 1

Where Y = Earnings

X_1 = Operating Leverage

X_2 = Financial Leverage

X_3 = Expected Value of Operating and Financial Leverage (Combined Leverage)

X_4 = Sales

$f_1 > 0; f_2 > 0$

From the regression result, the model used captured that R^2 has a coefficient of determination of 98.14%. This shows that the regression equation has a good fit. This also mean that about 98.14% of the variation in earnings is explained by increase in sales, operating leverage, financial leverage and combined leverage. The regression result also shows that there is a positive relationship between the level of earnings and the level of sales, operating leverage, financial leverage and combined leverage in Nigerian Breweries Plc. The higher the variables X_1, $X_{2,}$ X_3 and X_4 the higher the earnings. In assessing the level of significance of X_1, $X_{2,}$ X_3 and X_4 in the regression, the t-value associated with this variables are greater than 2.Thus we can accept that X_1, $X_{2,}$ X_3 and X_4 are good variables explaining earnings in the regression. The standard error for X_1, $X_{2,}$ X_3 and X_4 are 4.3%, 7.4%, 54.4% and 2.9% respectively for the regression and are also significant variables.

CONCLUSION

The importance of the concept of operating leverage is that it assists the manager in making appropriate decision concerning altering the firm's cost structure. For instance, if there are high prospects for future sales, then increasing the degree of operating leverage might be a wise decision. The greater the degree of financial of financial leverage, the more the fluctuations in earning per share. Financial leverage is positive when the profits of the firms increased because of the injection of debt and negative when profits decreased because of employment of debt. The total risk facing an organization can be managed by combining operating leverage and financial leverage in varying degrees. The hypotheses tested in the study using the ordinary least square method produced the results in table 2 above. The results showed that operating leverage, financial leverage, combined leverage and sales have significant influence on earnings of NB Plc by 98.14% (coefficient of determination). Therefore, the financial manager should understand the appropriate mix of the leverages to introduce at any time to maximize profit and consequently the wealth of the shareholder.

REFERENCES

Brigham, F.E (1985) Financial Management Theory and Practice, Dryden Press, Chicago

Brigham, F.E, Campey B.J (1985) Introduction to Financial Management, CBS College Publishing, New York.

Keown, A. J, Martin J.D, Petty, J.W and Scot, D.F (2003), Foundation of Finance, Pearson Education Ltd, New Jersey.

Levy, H, Sarnat, M (2002), Principles of Financial Management, Prentice Hall International

Myers, B (2003) Principles of Corporate Finance, McGraw-Hill Inc., Boston

Oloyede, B (2000), Principles of Financial Management, Forthright Educational Publishers, Lagos

Pandey, I.M (2002) Financial Management, Vikas Publishing House PVT Ltd, New Delhi.

Ross A.S, Westerfield, W.R, Jordan, B (2004) Essentials of Corporate Finance, McGraw Hill Inc, Boston.

Samuels, J.M and Wilkes, F.M (1961) Management of Company Finance, Third Edition, Thomas Nelson Publishing, Surrey KT 12 5PL.

Westerfield, W.R, Ross, A.S and Jordan D.B (2000) Fundamentals of Corporate Finance, McGraw-Hill Inc. New York.